

250 SEF FACTORY
300 SEF FACTORY



SHERCO

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FOREWORD

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 tools designed for the 250 SEF and 300 SEF engine.

This workshop manual complements the SHERCO 250 SEF and 300 SEF owner's manual.

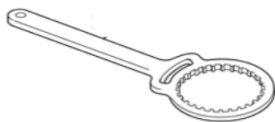
TOOLS LIST 250 / 300 SEF

250 / 300 SEF ENGINE

Fuel pressure
gauge 8691



Clutch holder tool
1814



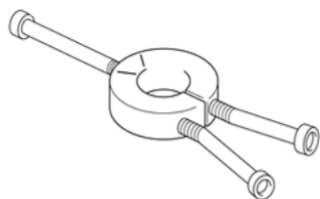
Piston support
plate 1818



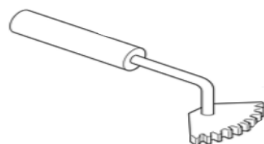
Owner's manual
8700



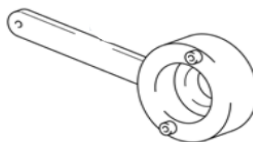
Inner bearing race
removal tool R464



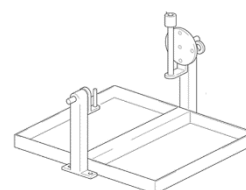
Primary drive
locking tool 1817



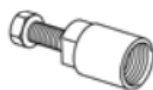
Flywheel locking tool
4753



Container / Engine stand
R481 / R455



Flywheel
puller R462



Top dead center
locking pin 10338



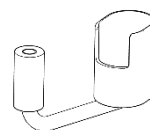
Diagnose tool
8561



Tools set
0726



Gearshift finger
locking tool 2073



FACTORY SUSPENSION

48mm clamp
7670



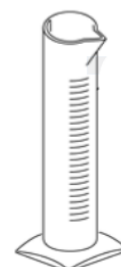
Top cap wrench
7666



Oil seal fitting
tool 7668



500 ml oil jug
7671



Oil seal installer
7669



Piston rod
holder 7667



Oil seal
installer 5028



TECHNICAL SPECIFICATIONS

ENGINE

	250 SEF	300 SEF
Type	Liquid cooled, single cylinder, 4 strokes engine	
Displacement	249.4 CC	303.7 CC
Bore / Stroke	78 / 52,2mm	84 / 54,8mm
Compression ratio	13,35 :1	12,72 : 1
Fuel	Unleaded , minimum RON : 95	
Valves timing	4 valves, DOHC, chain-driven	
Intake valves	Titanium, Ø 31mm	
Exhaust valves	Ø 26mm	
Valves clearance, Intake	0,15~0,20mm	
Valves clearance, Exhaust	0,20~0,25mm	
Crankshaft bearing	2 roller bearings	
Piston	Forged Aluminum	
Lubrication	Pressure feed with 3 trochoid pumps	
Motor oil	1 liter SAE 5w40	
Primary drive ratio	21 :70	
GEAR BOX :	6 speed	
1 st	14 : 33	
2 nd	17 : 30	
3 rd	19 : 28	
4 th	21 : 26	
5 th	23 : 24	
6 th	25 : 22	
Final drive ratio	13 X 49	13 X 48
Clutch	Multi-disk in oil bath. Hydraulic command	
Ignition system / Battery	Electric 12V 4Ah / LTZ5S Lithium 12V 2Ah	
Engine management	Synerject Electronic Injection	

TECHNICAL SPECIFICATIONS

FRAME

Frame	Semi-perimeter CrMo steel with aluminum subframe
Front fork	KAYABA USD Ø48mm Closed cartridge
Rear suspension	KAYABA piggyback Aluminum swing arm
Stroke Front/Rear	FACTORY 330/330mm RACING 300/330mm
Front brake	Disc Ø 260mm
Rear brake	Disc Ø 220mm
Brake disc thickness	limit : 2.7mm front / 3.6mm rear
Front tyre	90/90-21"
Rear tyre	140/80-18"
Pressure front / rear	0.9 bar
Fuel tank capacity	9.7l with 1 liter of reserve
Rake angle	27.3°
Wheel base	1480mm



STANDARD SETTINGS

FORK

Original settings FACTORY – Fork KAYABA USD Ø48 mm (Closed cartridge)

Compression	Comfort	20 clicks back
	Standard	12 clicks back
	Sport	8 clicks back
Rebound	Comfort	18 clicks back
	Standard	12 clicks back
	Sport	10 clicks back
Spring	Rider weight : 65-75 kg	4.0N/mm
	Rider weight : 75-85 kg	4.2N/m
	Rider weight : 85-95	4.4N/m
Fork oil	01M	345 CC

Original settings RACING – Fork KAYABA USD Ø48 mm

Compression	Comfort	18 clicks back
	Standard	14 clicks back
	Sport	12 clicks back
Rebound	Comfort	15 clicks back
	Standard	12 clicks back
	Sport	10 clicks back
Spring	Rider weight : 65-75 kg	4.0N/mm
	Rider weight : 75-85 kg	4.2N/m
	Rider weight : 85-95	4.4N/m
Fork oil	01M	670 CC

SHOCK ABSORBER

Settings – KAYABA shock absorber

Low-speed compression	Comfort	20 clicks back
	Standard	14 clicks back
	Sport	12 clicks back
High-speed compression	Comfort	2,5 turns back
	Standard	1.5 turns back
	Sport	1 turn back
Rebound	Comfort	15 clicks back
	Standard	13 clicks back
	Sport	11 clicks back
Spring stiffness	Rider weight : 65-75 kg	46N/mm
	Rider weight : 75-85 kg	48N/mm (Standard)
	Rider weight : 85-95 kg	50N/mm
Type of oil		K2C

OPERATIONS REQUIRING ENGINE REMOVAL OR NOT

	ENGINE REMOVAL REQUIRED	ENGINE REMOVAL NOT REQUIRED
Crankshaft	•	
Gear box	•	
Crankshaft bearings	•	
Gear Box bearings	•	
Piston		•
Cylinder		•
Cylinder head		•
Valves timing		•
Ignition		•
Engine starter redrive		•
One-way starter clutch		•
Clutch		•
Water pump		•
Oil pump		•
Gear selection		•

REMOVING THE ENGINE

WARNING

*To remove the engine, you must remove the swing arm axle, the swing arm and the rear wheel.
To keep the bike from falling, remember to support the chassis with an appropriate jack.*

- Drain (refer to the owner's manual)
 - the engine oil
 - the engine coolant
- Remove the seat.
- Disconnect the battery.
- Remove the fuel tank and its covers.
- Disconnect all the electrical wiring connectors from the engine.
(Starter, TPS sensor, coolant temperature sensor, ignition coil, fuel injector)
- Remove the exhaust.
- Remove the throttle body.
- Remove the chain.
- Remove the chain guard.
- Remove the clutch slave cylinder.

WARNING

*When the clutch slave cylinder is removed from the engine, its piston is no longer held.
Keep the piston from escaping using a ziptie.*

- Remove all of the water hoses connected to the motor.
- Remove the left radiator.
- Loosen all of the engine bolts.
- Loosen the swing arm bolt.
- Remove the brackets supporting the cylinder head to the frame.
- Remove the motor mounting bolts.
- Remove the swing arm bolt.
- Remove the engine.

REINSTALLING THE ENGINE

The motor should be reinstalled in the frame in the reverse order of how it was removed. The following torque values should be used:

Tightening torques:

Motor mounting bolts: 60Nm

Swing arm axle nut: 100 Nm

Clutch slave cylinder screws: 10 Nm

Cylinder head bracket bolts: 23Nm

Exhaust mounting bolts: 10Nm

ENGINE TOP END REMOVAL

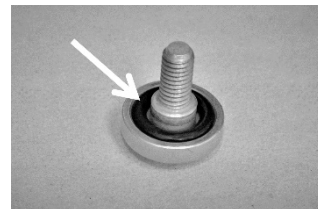
For exploded views, refer to the 250 / 300 SEF partsbook.

► Preparation

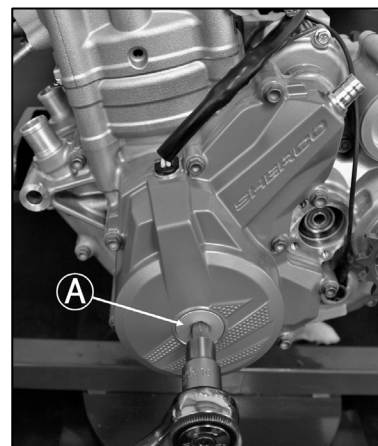
- Place the engine on the R455 engine stand.
- Drain the engine oil (see owner's manual).
- Make sure to be in a clean and sorted environment before starting dismantling of the engine.
- Remove the spark plug.
- Remove the three valve cover screws.

WARNING

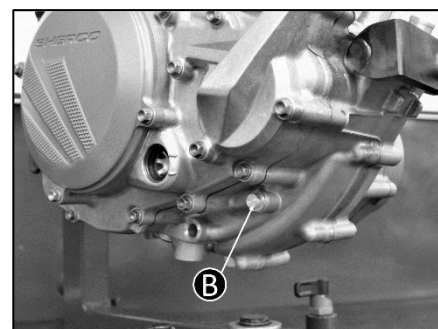
These three screws are fitted with O-rings Ref: 0900 (see photo)



- Remove the valve cover.
- Remove the ignition cover plug [A]

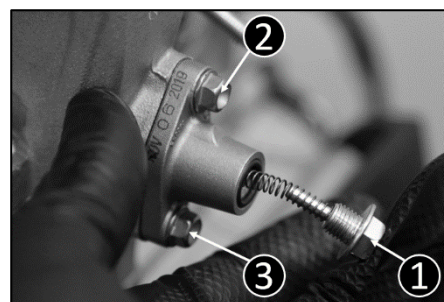


- Remove the TDC control plug [B]
- Rotate the crankshaft until you can see its timing mark through the hole, then install the Top Dead Center locking tool 10338.



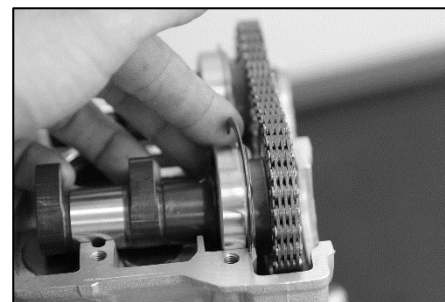
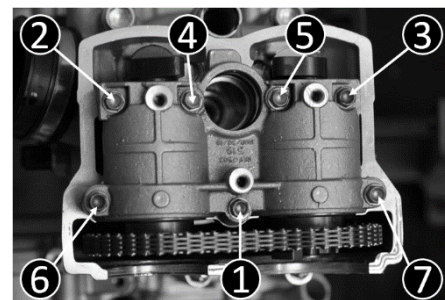
► Removing the timing chain tensioner

- Remove the tensioner screws, in the order shown.
- Remove the cam chain tensioner.



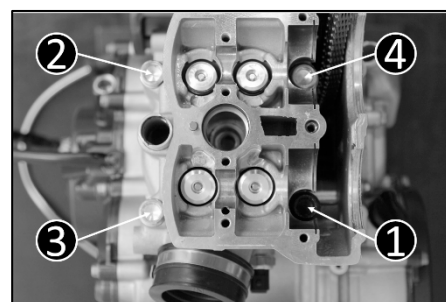
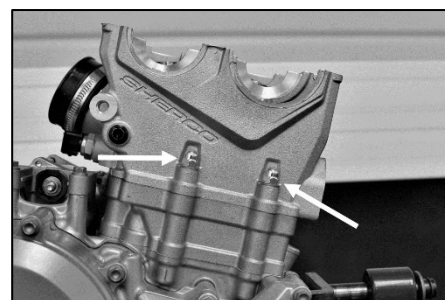
› Removing the camshafts

- Remove the spark plug shaft insert.
- Loosen and remove the screws from the camshafts bearing bridge, following the order shown.
- Remove the exhaust camshaft retaining ring.
- Remove the exhaust camshaft.
- Remove the intake camshaft retaining ring.
- Remove the intake camshaft.



› Removing the cylinder head

- Remove the two M6 nuts and their copper washers.
- Remove the cylinder head screws. (Loosen them following a cross-path sequence)



WARNING

*The two internal screws 1&4 and are fitted with support ring.
The black screw N° 1 has a different length.*

- Remove the cylinder head.
- Remove the head gasket and the cylinder.

INDIVIDUAL PARTS INSPECTION

» Top end inspection

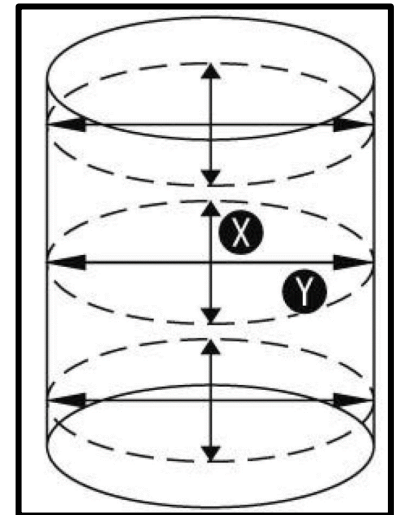
Inspection of the cylinder for wear

Measure the inside diameter of the cylinder when cold.

Inspect the cylinder wall for any scratches or other evidence of abnormal wear. If the cylinder is badly damaged or worn out, it should be replaced.

Since the cylinder does not wear in a uniform way, measure it in several places, on the **X** and **Y**-axis, as shown.

If the inside measurement of the cylinder exceeds the tolerance, it must be replaced.



(A)=10 mm

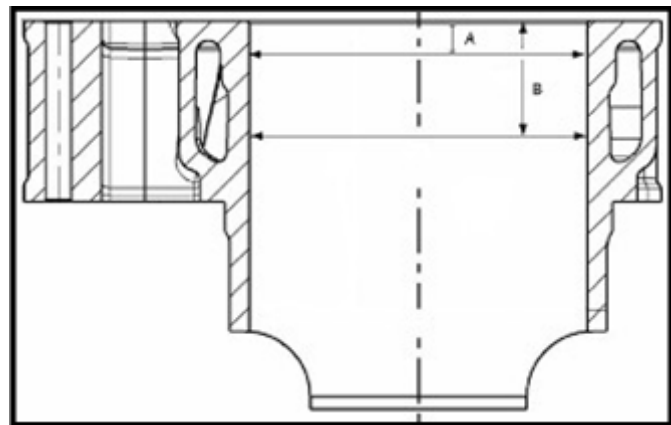
(B)=25 mm

Standard 250 SEF:

Cylinder diameter (A): $77.982 \pm 0.008 \text{ mm}$

Taper limit: 0.05mm

Out of round limit: 0.05mm



Standard 300 SEF:

Cylinder diameter (A): $83.982 \pm 0.01 \text{ mm}$

Taper limit: 0.05mm

Out of round limit: 0.05mm

Piston / Cylinder clearance

Piston / Cylinder clearance

Standard 0.03 ~ 0.05 mm

Limit 0.10 mm

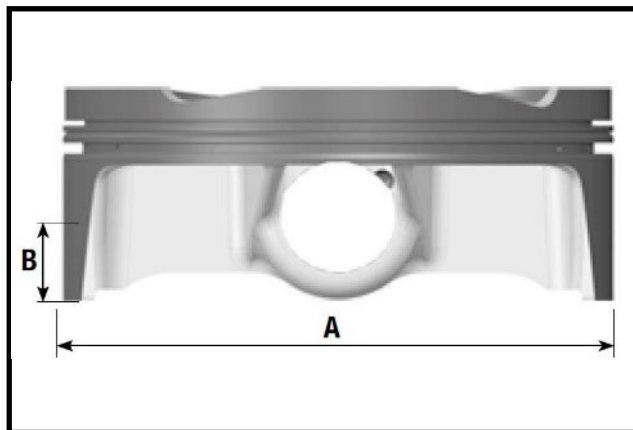
» Piston wear

- Using a micrometer measure the outside diameter of the piston [A] 10mm [B] above the bottom of the piston and at right angles to the axis of the piston.

If the outer diameter of the piston is below the tolerance, it must be replaced.

Piston 250 SEF= 77.9400 ± 0.005 mm

Piston 300 SEF= 83.950 ± 0.005 mm



Piston ring / groove clearance

- Using a feeler gauge measure the clearance between the piston ring and the ring groove.
- Check in several places to determine the actual clearance. If the clearance is greater than the maximum, replace the piston ring and, if needed, the piston.

Compression ring:

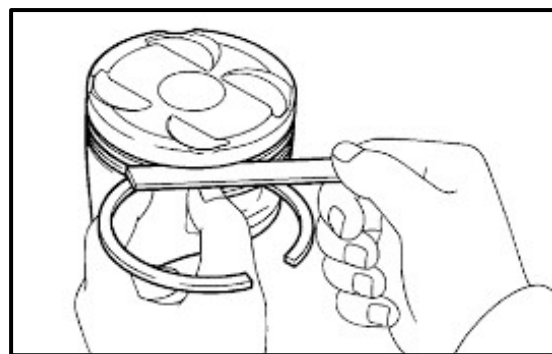
Standard=0.030~0.065 mm

Limit: 0.13 mm

Oil ring:

Standard=0.020~0.055 mm

Limit: 0.13 mm



Ring end gap

- Compression ring:** 0.3~0.4 Limit 0.7 mm
- Oil ring:** 0.3~0.5 mm

Inspect the connecting rod, the piston pin and the piston for wear

- Visually inspect the wrist pin snap rings in place. If they appear worn or distorted, replace them. If the snap ring groove looks worn, replace the piston.
- Measure the piston pin with a micrometer. If at any place on the pin the diameter is below the limit replace the piston pin. Measure the piston pin bore diameter. If the diameter is above the limit, replace the piston. Measure the small end bearing in the connecting rod. If the diameter is above the limit, replace the connecting rod.

Piston pin diameter

15.997-16.000 mm

Piston pin hole diameter in the piston

16.004-16.009 mm

Connecting rod hole diameter

16.000-16.011 mm

INDIVIDUAL PARTS INSPECTION

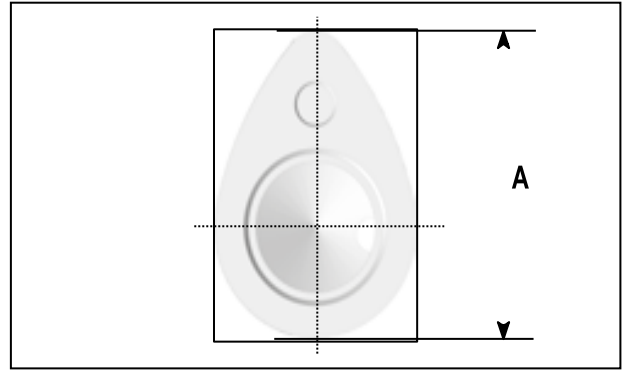
Check the camshafts for wear

- Remove the camshafts.
- Measure the heights **[A]** of the cams lobes with a micrometer.
If the cams are worn out beyond the limits, replace the camshaft.

Cam height limit 250 /300

Exhaust: 32,15 mm

Intake: 32,45 mm



Checking the camshafts and camshaft journals for wear

- Measure the clearance of the camshaft journals bearings using *plastigauge* **[A]**.
- Install the camshaft bridge, with its bolts lubricated with engine oil, and tighten to the proper torque.

**Camshaft bridge bolts tightening torque :
10 Nm**

If any of the measurements are over the limit, measure the diameter of each journal.

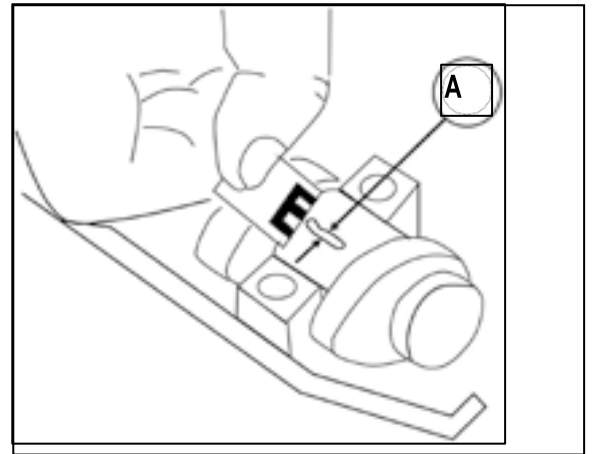
Camshaft / journal clearance:

Standard: 0.020 – 0.062 mm

Limit: 0.15 mm

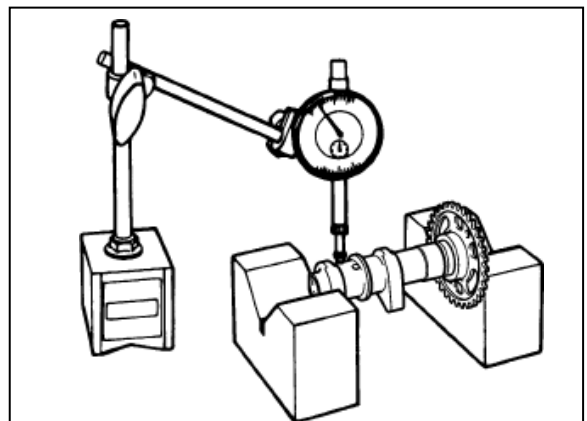
If the diameter of the journal is over the limit, replace the camshaft and measure again.

If the clearance is over of the limit, replace the cylinder head.



Camshaft runout

- Measure the camshaft runout as shown.
If it is over the tolerance, replace the camshaft.
Runout limit: 0.03 mm



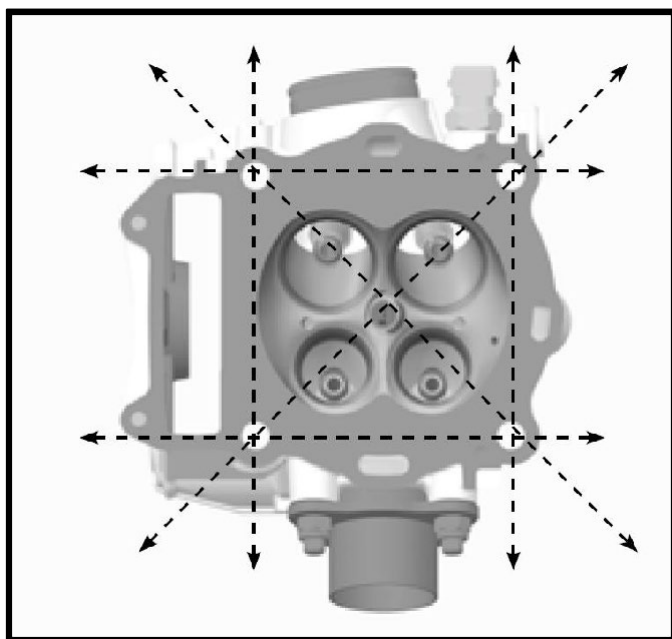
INDIVIDUAL PARTS INSPECTION

›) Cylinder head inspection

Inspect the cylinder head for flatness

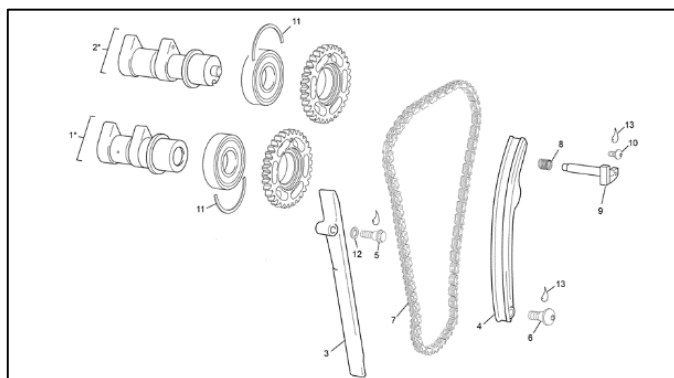
- Remove the cylinder head.
- Using a precision straight edge and a feeler gauge check the head for warpage; check in several places as shown in the photo. If the warpage is above the limit, repair if possible. If the damage is severe, replace the head.

Cylinder head warpage limit = 0.05 mm



›) Visually inspect the timing chain for damage

- Clean all parts.
- Visually inspect the timing chain : check for any hard spot, resistance, or wear. If any, it must be changed.
- Visually inspect the timing gears. Replace if needed.
- Visually inspect the chain guides. Replace if needed.



›) Valve – Guide clearance

Intake:

Clearance: **0,02 mm~0,045 mm**

Exhaust:

Clearance: **0,04 mm~0,065 mm**

REASSEMBLING THE TOP END OF THE ENGINE

» Reassemble the piston

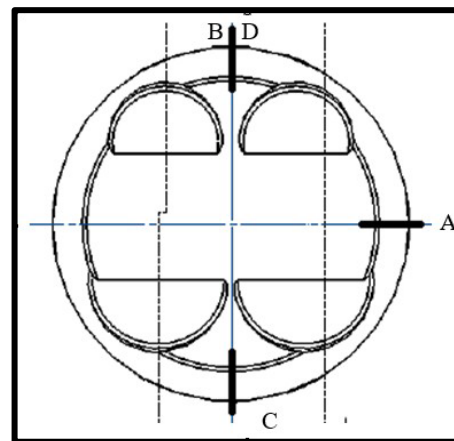
- Install the piston rings on the piston with the end gaps as shown in the photo, the compression ring fits into top groove and the oil ring fits into bottom groove.

[A] Oil ring expander end gap

[B] Lower oil ring end gap

[C] Upper oil ring end gap

[D] Compression ring gap

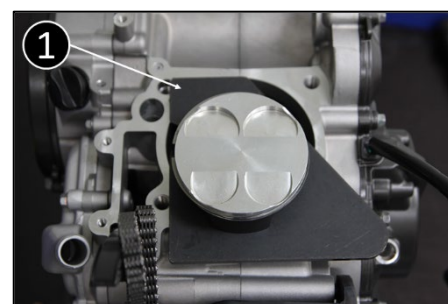


WARNING

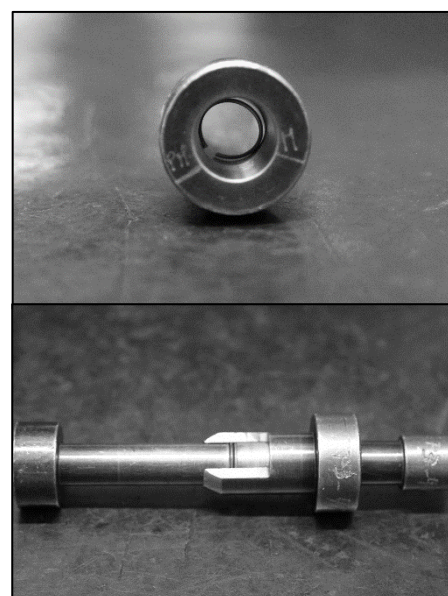
The expander rings do not have a top or bottom; however, install the oil ring and the compression ring with the « N » mark facing upwards.

- Apply engine oil to the wrist pin bore in the piston.
- Carefully note the piston orientation. (the small valves pockets goes on the exhaust side)

Use special tool number 1821 to hold the piston in the correct position **1**.

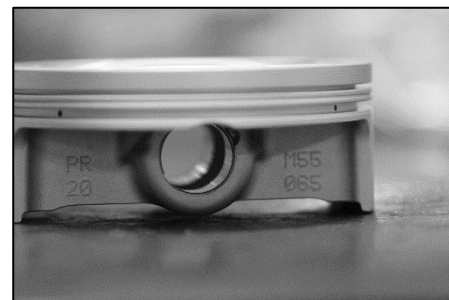


- Place one of the clips in the special tool number 2075 as shown in the photo; install the clip close to one end of the tool
- Use the tool to set up the clip for installation on the wrist pin.
- Install the snap ring on the piston.



REASSEMBLING THE TOP END OF THE ENGINE

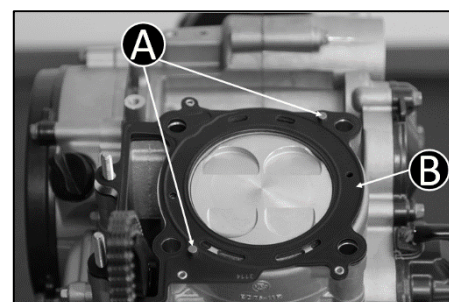
- Install the wrist pin into the piston and connecting rod using the tool and lightly striking.
- Install the opposite snap ring, using the special tool.
- Make sure the two dowel pins are in place.
- Fit a brand new base gasket.



WARNING

Use the same base gasket thickness (0.3 or 0.4mm depending on the model)

- Apply engine oil on cylinder wall.
- Fit the cylinder over the piston using piston rings compressor plier.
- Install the two cylinder head dowel pins [A].
- Install the head gasket [B].
- If the starter motor had been removed, reinstall it.



› Reassemble the cylinder head

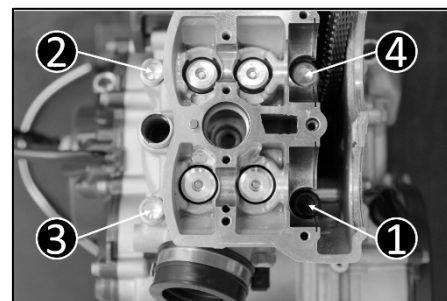
WARNING

*The two internal screws 1&4 are fitted with washers.
The black screw N° 1 is the longest.*

- Install the head screws noting the different lengths; tighten them using two steps in the tightening sequence shown:
- Install and tighten the two M6 nuts, with their copper washers.

Cylinder head screws tightening torque:

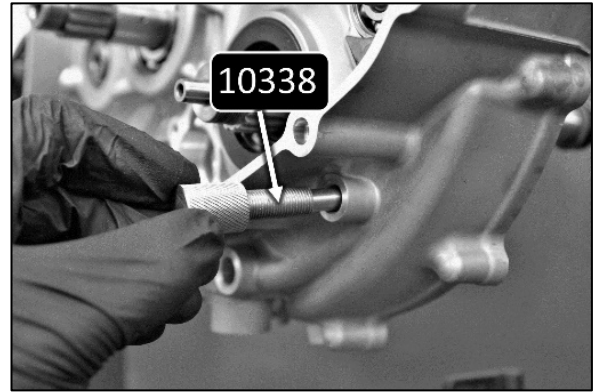
- **M10 screws:**
 1. 1st step: 30 Nm
 2. 2nd step: 45 Nm
- **M6 Nuts: 10Nm**



REASSEMBLING THE TOP END OF THE ENGINE

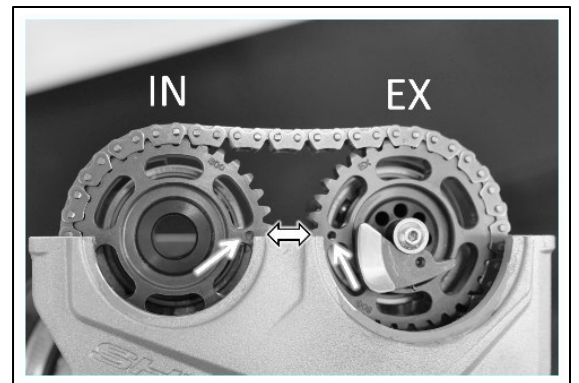
› Setting the valves timing

- Make sure the crankshaft is at top dead center, with the TDC locking tool 10338 still in place.

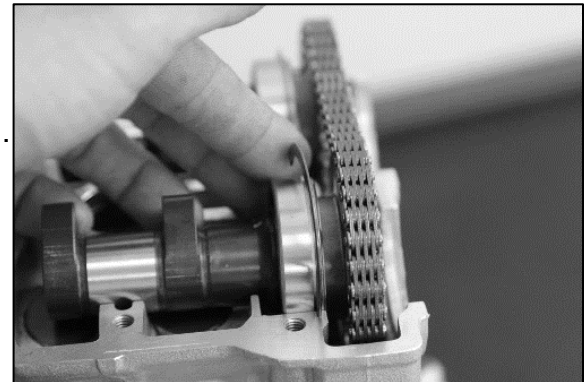


- Install the intake camshaft
- Install the exhaust camshaft

(See the picture for the timing marks)



- Install the camshafts retaining clips, half fitted in the head.
- Apply MoS2 grease to the camshafts journals.



REASSEMBLING THE TOP END OF THE ENGINE

- Make sure the two dowel pins are in place, then fit the camshaft bridge, using the proper tightening sequence.

Camshafts bridge screws tightening torque: 10Nm

WARNING

The screw n°1 is a M6 X 35

- Install the camshaft chain tensioner using a new gasket.

Torque the two fixing bolts to: 10Nm

- Install the cam tensioner adjusting bolt (pay attention to the o-ring).

Torque the tensioner adjusting screw to: 10Nm

- Remove the TDC locking tool 10338.
- Rotate the engine a few times to make sure that the valve timing is correct.
- Finally check the valve timing according to the timing marks.
- Replace the plug instead of the TDC locking tool 10338.

Torque the TDC plug to: 8Nm

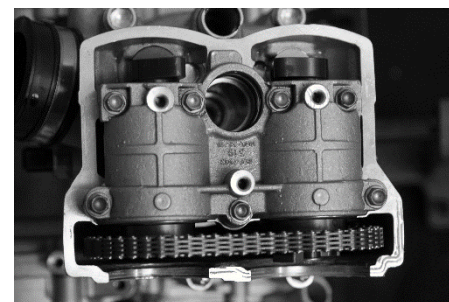
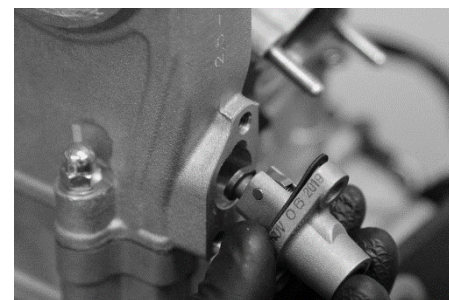
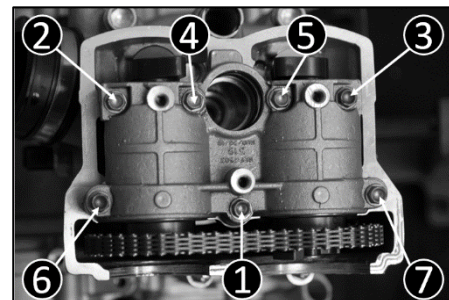
- Replace the spark plug shaft insert.

WARNING

Make sure that the O-rings are installed on the spark plug shaft insert.

- Apply a thin coat of RTV sealant over the valve cover gasket, at the camshafts end cap bores.
- Install the valve cover.
- Fit the valve cover screws.

Torque the screws to: 8Nm



» Valves clearance

- The valves clearance must be checked when the engine is cold.
- Remove the spark plug and the valve cover.
- Remove the timing plug from the crankcase.
- Install TDC locking tool 10338.
- With a feeler gauge measure the clearance between the bucket and the cam.

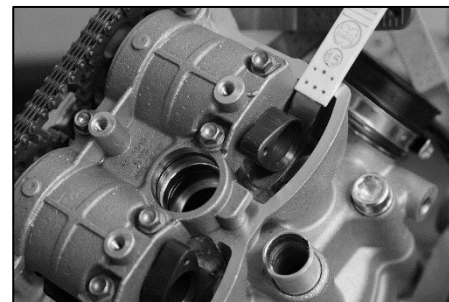
Valves clearance

Intake : 0.15 ~ 0.20 mm

Exhaust : 0.20 ~ 0.25 mm

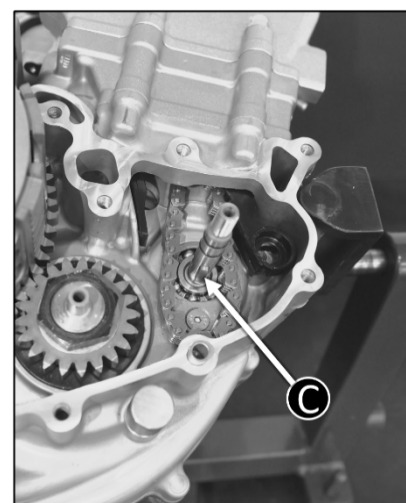
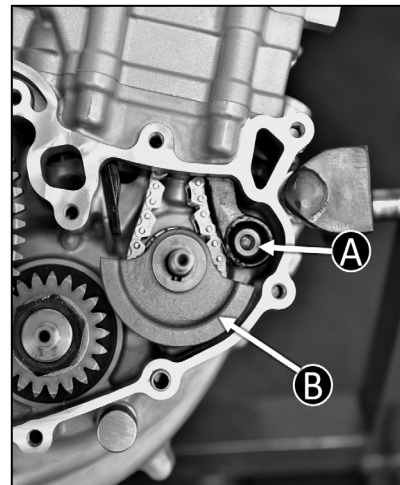
- If the clearance is not correct then replace the valves shims in order to obtain the correct clearance.
- Remove the valve bucket and shims with a magnet.
- Measure the thickness of the shims and replace with one of the correct thickness.

Select the appropriate shims from the spare parts catalog.



» Replacing the timing chain

- Remove the camshafts (see the chapter about the top end).
- Remove the clutch cover (see the chapter on « Right side » removing the clutch).
- Remove the chain tensioner adjuster.
- Remove the tensioner shoe screw **[A]**.
- Remove the timing gear **[B]**, pay attention to its feather key.
- Remove the timing chain downwards.
- Inspect the cam chain. (see «visually inspecting the cam chain»)
- To reassemble, pass the chain from below, first around the water pump shaft, then up through its channel.
- Fit the timing gear on its shaft, making sure its key **[C]** is present, and engage the chain on its teeth.
- Apply medium threadlocker to the tensioner shoe screw **[A]** and tighten it to **10Nm**.
- Set the valves timing (see "*Setting the valves timing*" section).



DISASSEMBLING THE RIGHT SIDE

›| Clutch dismantling

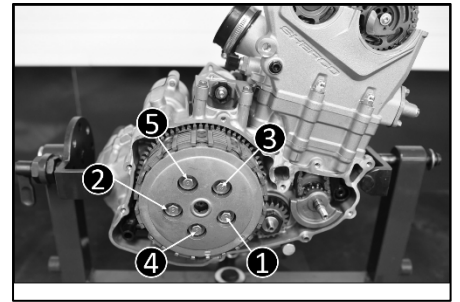
- Install TDC locking tool 10338.

WARNING

*Only use this tool for the pressure plate removal,
do not use it to remove the hub fixing nut.*

- Remove the 4 screws that holds the clutch cover.
- Remove the 5 pressure plate screws (see the picture).

Make sure that the clutch hub rotates freely.



›| Clutch inspection

- Inspect the discs to make sure they are trimmed and smooth

Friction discs thickness:

Standard: 2.95mm

Limit: 2.7mm

Warpage limit: 0.3mm

Steel discs thickness

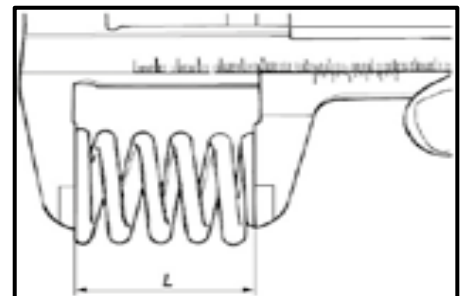
Standard: 1.4mm

Limit: 1.3mm

Warpage limit: 0.3mm

›| Check the clutch spring length

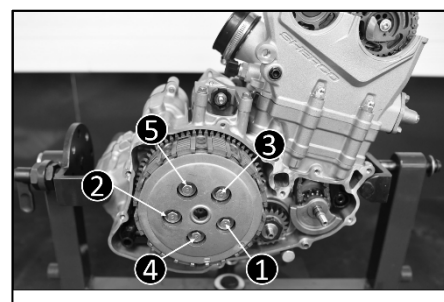
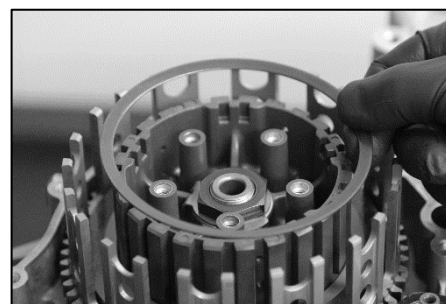
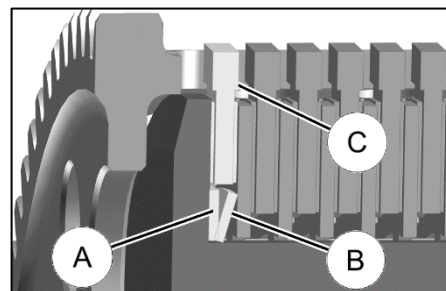
- Measure the free length of the springs.
Standard : 35.8 mm
Limit : 35 mm



›) Reassembling the clutch discs

- Soak the friction discs in engine oil.
- Install in this order :
 1. The seat washer **[A]** ,
 2. The judder spring **[B]** (the correct way; see picture)
 3. The special narrow friction disc **[C]**.
- Install all the steel and friction discs; the last one is a friction disc.
- Reinstall the pressure plate.

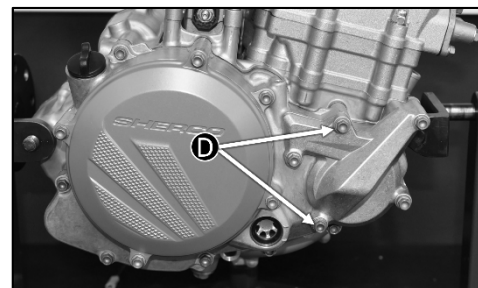
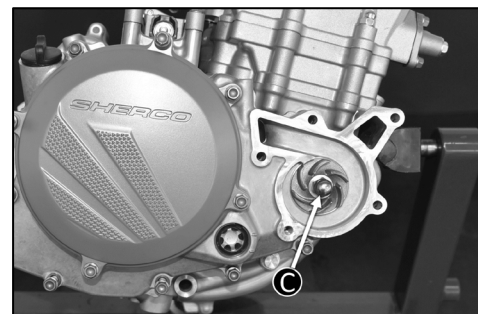
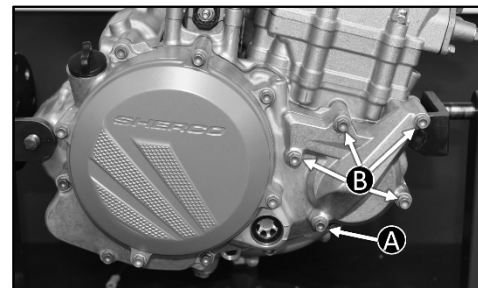
**Torque the pressure plate M6 screws to:
10Nm**



► Replacement of water pump bearings and oil seals

- In the clutch cover :

- Drain the coolant by removing the screw [A].
- Remove the other screws [B] from the water pump housing.
- Remove the water pump cover and gasket
- Remove the water pump impeller by unscrewing its nut [C], as well as its spacer.
- Remove the clutch casing.
- Heat up the clutch casing in an oven to 70°C.
- Extract the bearing, towards the **inside** of the casing.
- Extract the oil seal, towards the **outside** of the casing.
- Reassemble in reverse, not forgetting the seals under the screws [D].



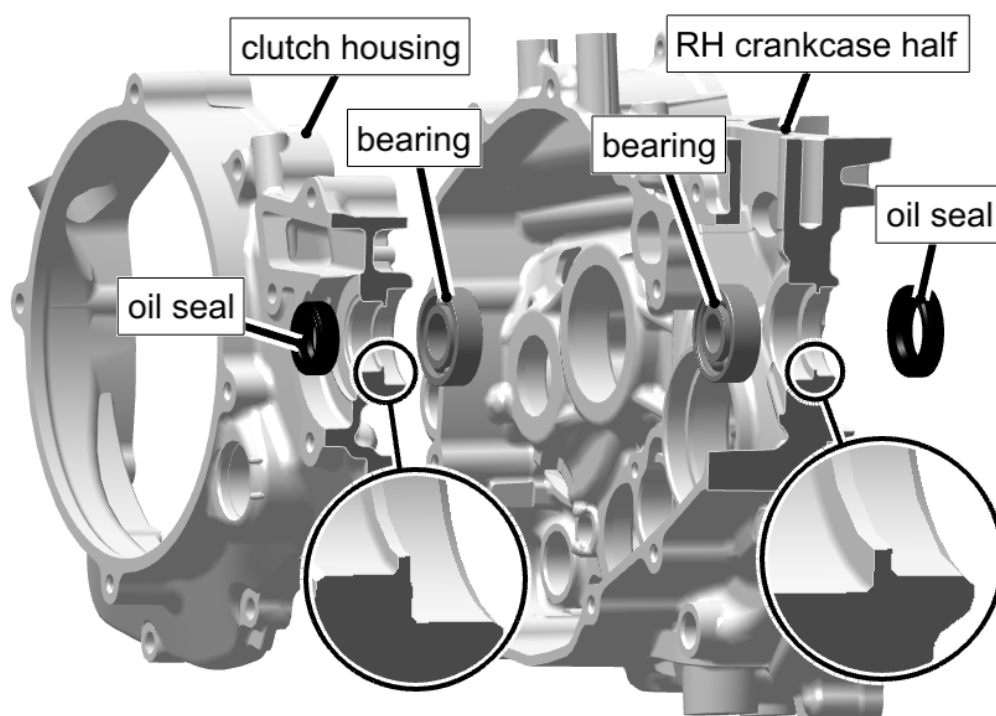
- In the main crankcase :

- Repeat the above operations, then ;
- Split the crankcases.
- Remove bearing retainer plate.
- Heat up the crankcase in oven to 70°C.
- Extract the oil seal, towards the **inside** of the crankcase.
- Extract the bearing, towards the **outside** of the crankcase.
- Reassemble in reverse order, not forgetting the seals under the screws [D]. **Tighten the screws to 10Nm.**

When reassembling the water pump impeller, do not forget the lock washer; apply strong threadlocker to its nut and **tighten to 30Nm.**

WARNING:

There is a shoulder in each bearing and oil seal housing, make sure to respect the extraction direction (see picture).



DISASSEMBLING THE ENGINE

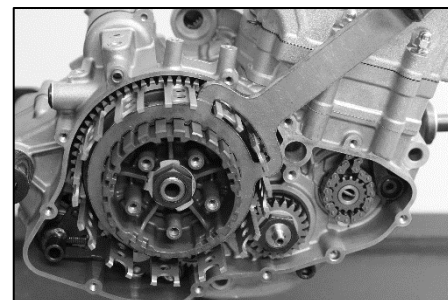
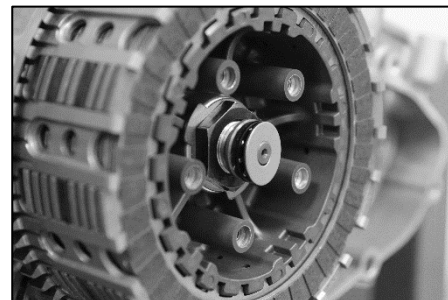
›) Removing the clutch hub and the clutch basket

- Drain the engine oil and the engine coolant.
- Remove the clutch casing.
(see “disassembling the right side” paragraph)
- Remove the pressure plate.
- Remove the clutch release bearing assembly.
- Hold the clutch hub, using tool 1814.

WARNING

Make sure TDC locking tool 10338 is not installed, if so, severe damage could occur to the crankshaft and crankcase.

- Loosen the clutch hub nut.
- Remove the hub and the basket.
- Inspect the needle bearings and replace if needed.
- Visually inspect the hub and the basket.



›) Reassembling the clutch hub components

- Install the thrust washer.
- Install the needle bearings.
- Install the clutch basket.

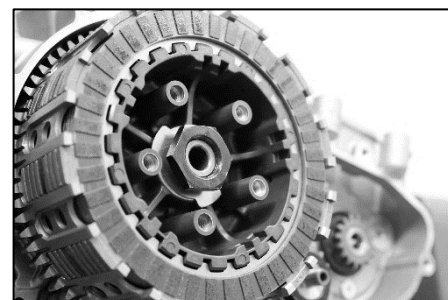
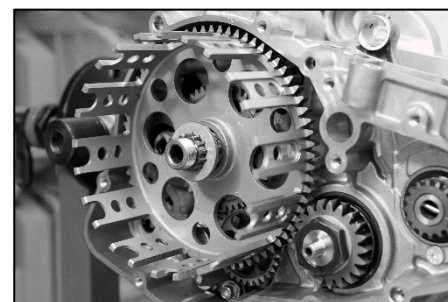
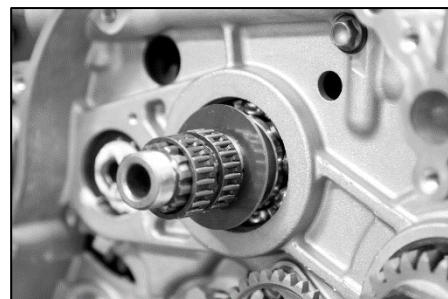
WARNING

The clutch basket gear and the crankshaft gear are paired.

- Install the splined spacer washer.
- Install the clutch hub.
- Install the lock washer.
- Degrease the threads of the shaft and the nut.
- Apply medium thread locker (blue) to the threads.
- Install the fixing nut

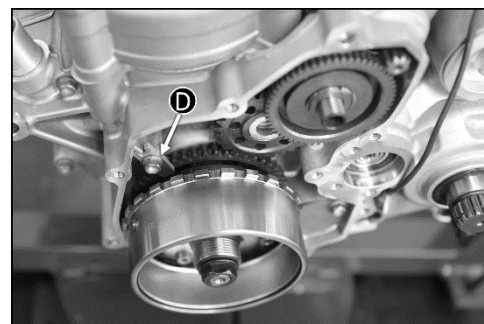
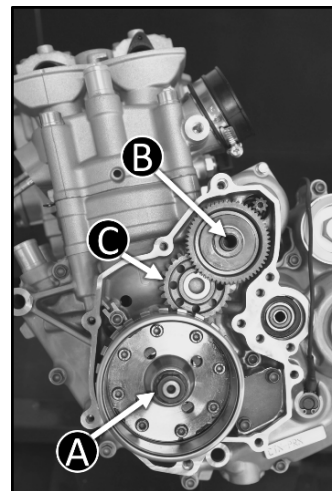
Tightening torque of the hub nut : 80Nm

- Make sure the hub rotates freely.
- Bend the special washer over the nut.
- Install the clutch discs according to the “Reassembling the clutch discs” section.



›| Removing the flywheel

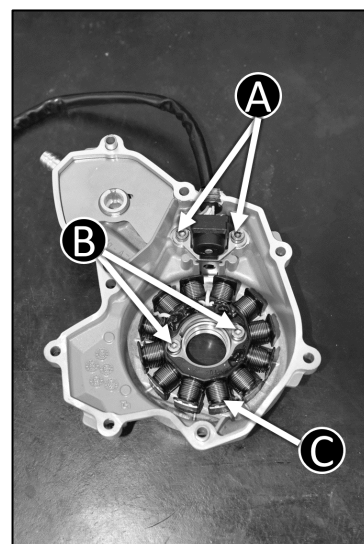
- Hold the flywheel using the tool 4753.
- Release the fixing nut **[A]**.
- Remove the flywheel using the flywheel puller R462.
- Remove the torque limiter and its axle **[B]**, idler gear **[C]** and freewheel retaining plate **[D]**.
- Remove the starter clutch.



›| Replacing the stator and sensor system

- Remove the 2 sensor retaining screws **[A]** and the 2 stator screws **[B]**.
- Remove the stator **[C]**.
- Install the new parts.
- Reinstall the screws using the proper torque with strong threadlocker.
- Do not forget the AET lock washers on the stator screws.

Torque the stator and sensor screws to: 8Nm.

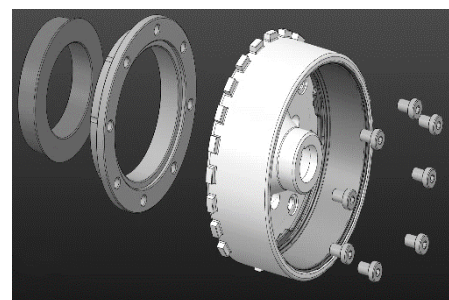


› Inspect the one-way bearing and the needle bearings

- Visually inspect the needle bearings.
- Replace if required.
- Inspect the race of the freewheel gear and the one-way bearing housing.
- Replace the freewheel gear if needed.
- Split the free wheel from the rotor by loosening the 8 M5 screws.
- Inspect the freewheel housing.
- Replace if needed.
- Finally check the rollers on the freewheel.
- Replace if required.

WARNING

If the one-way bearing must be replaced, so is the bearing housing, and vice versa

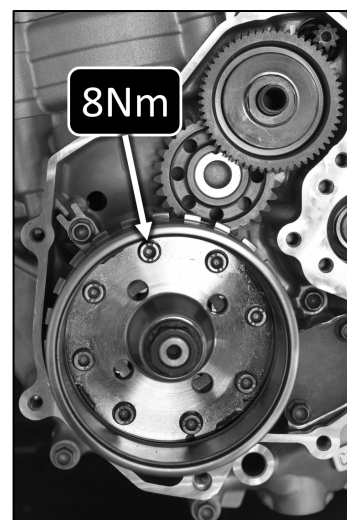


DISASSEMBLING COVER

» Reassembling the ignition case

- Install the freewheel gear.
- Fit starter idler gear.
- Inspect the rotor woodruff key, change if needed.
- Pre-assemble rotor assembly.
- Fit the one-way bearing in its housing.
- Screw the assembly to the rotor using the 8 M5 screws previously coated with medium threadlocker.

Tightening torque for M5 rotor screws: 8Nm

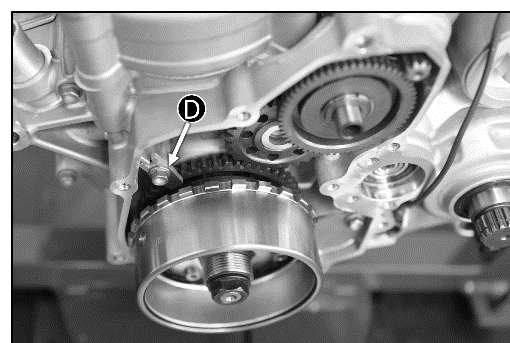


- Install the rotor (turn the flywheel counter clockwise to help the installation in the one-way bearing).
- Degrease the threads of the crankshaft and the flywheel nut, and apply high strength threadlocker.
- Install the conical washer.
- Using the flywheel holder 4753, tighten the fixing nut.

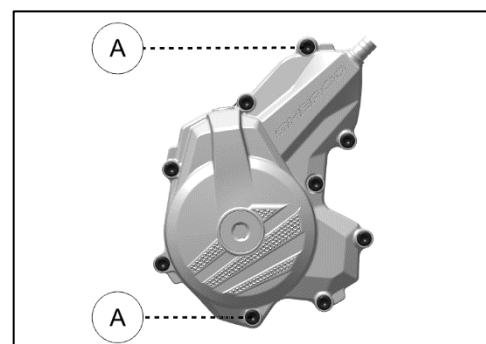
Tightening torque for M12 flywheel nut: 80Nm



- Fit the torque limiter and its axle
- Do not forget to fit the freewheel retainer [D], using medium threadlocker.



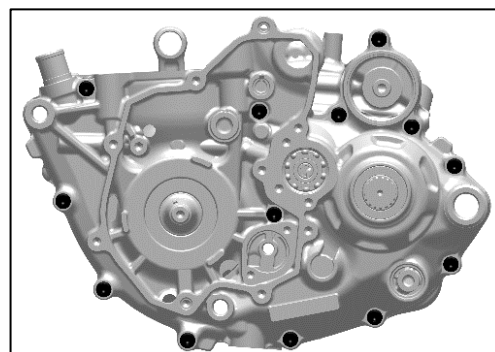
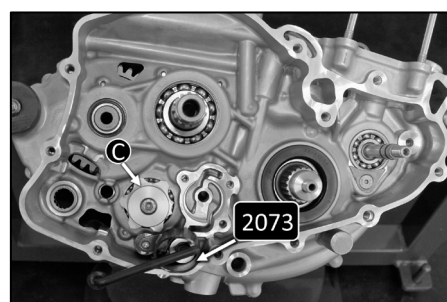
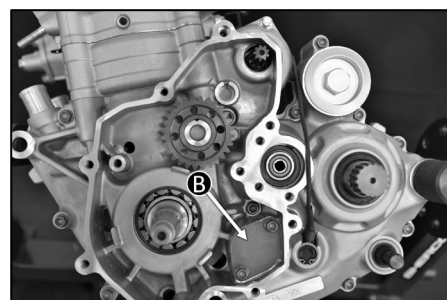
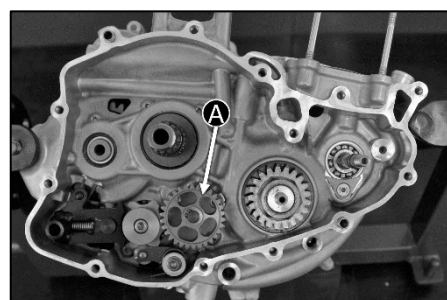
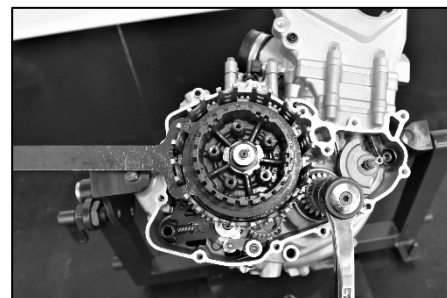
- Install the two case dowel pins at the [A] marks.
- Install a new gasket.
- Install the ignition cover and **tighten its 9 screws to 10 Nm.**
- The screws [A] are M6X35; all the others are M6X25.



CRANKSHAFT - TRANSMISSION - MAIN CRANKCASES

» Disassembling the transmission and the crankshaft

- Remove the engine from the frame (see the engine removal chapter).
- Remove the top end (see the top end chapter).
- Remove the engine starter.
- Remove the ignition components (see the ignition chapter).
- Remove the timing chain tensioner and guides.
- Remove the timing chain (see the top end chapter).
- Remove the clutch discs (see the clutch chapter).
- Hold the clutch basket with special tool 1814.
- Loosen and remove primary drive gear nut.
- Remove the clutch basket, the needle bearings and the thrust washer.
- Remove the lock ring M171 at the end of the secondary shaft.
- Remove the snap ring, washer, oil pump drive gear [A] and drive needle.
- Remove the oil pump cover.
- Remove the oil pump rotor, and its drive needle.
- Turn the engine over, and remove the ignition-side oil pump cover [B].
- Remove the two oil pumps, and theirs drive needles.
- Remove the oil pump shaft.
- Remove the gear selector shaft.
- Using special tool number 2073 hold the gearshift-locking finger and remove the gearshift drum plate [C].
- Remove special tool number 2073.
- Loosen and remove the 13 main crankcase screws, from the left-hand side of the engine.



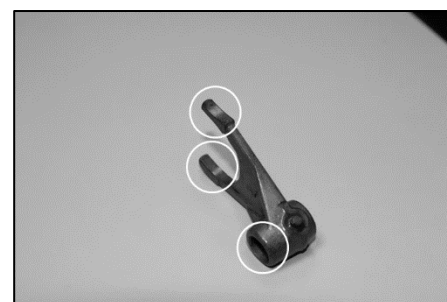
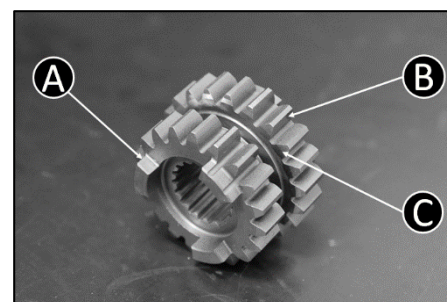
DISASSEMBLING CRANKCASES

- Lay the engine on its ignition-side, and then lift the left half-case.
- Remove the crankshaft.
- Remove the counter shaft.
- Remove the shift forks axles, and the shift forks. Pay attention to their rollers.
- Remove the gearshift drum.
- Remove the gearbox shafts.



› Checking the gearbox

- Check the condition of all gears.
- Inspect the engagement dogs **[A]**, look at all of the gear teeth **[B]** and fork groove **[C]** on each gear.
If any of the parts are damaged or badly worn they should be replaced.
- Check the condition of all the shifting forks.
Replace the shifting forks if needed.
- Check the gearshift drum; inspect its slots: make sure it is not deformed, damaged or badly worn.
Replace the gearshift drum if needed.



» Checking the crankshaft

Big end radial clearance

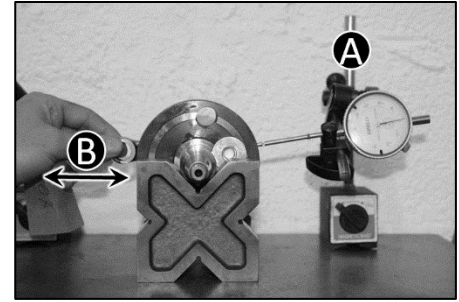
- Place the crankshaft in a set of V blocks and install a dial indicator as shown [A].
- Push the conrod [B] back and forth towards the indicator. The difference between the two measurements is the radial clearance.

Radial play of the big end bearing:

Standard: 0.015 mm – 0.020 mm

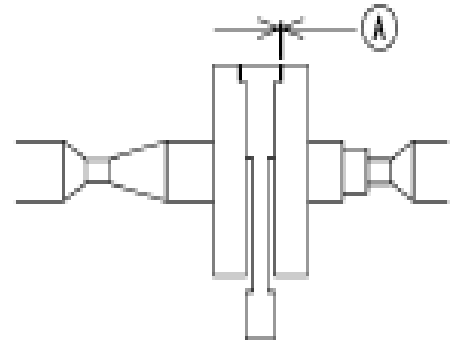
Maximum clearance: 0.06 mm

If the radial play exceeds the tolerance, the crankshaft / conrod kit must be replaced.



Big end axial play

- Using feeler gauges, measure the big end axial play [A].
Big end axial play: Standard: 0.2 mm ~ 0.3mm
Tolerance limit: 0.55 mm
If the big end axial play exceeds the tolerance, the crankshaft / conrod kit must be replaced.



Checking the run out

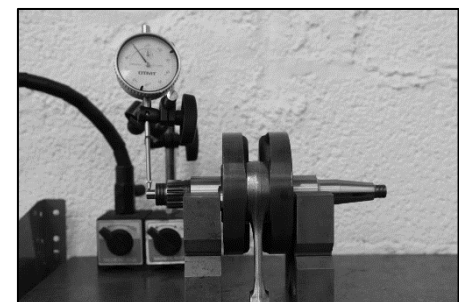
- Place the crankshaft on V-blocks or a suitable stand, place dial indicators as shown.
- Turn the crankshaft and record the measurements. The difference between the measurements is the crankshaft run out.

Run out:

Standard: ≤ 0.02 mm

Tolerance limit: 0.08 mm

If the run out exceeds the tolerance, replace the crankshaft or true it so that it meets the tolerance.



DISASSEMBLING CRANKCASES

» Checking the crankcases

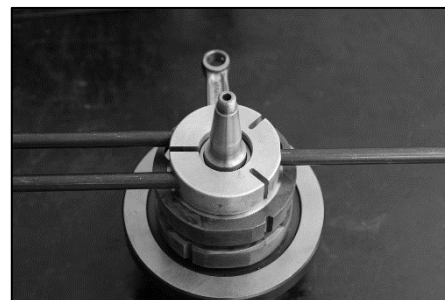
- Inspect the general condition of the crankcases for wear and cracks.
 - Replace the crankcases if needed.
 - Check the condition of all the bearings. Replace the bearings if required.
 - Inspect the crankshaft bearings inner races.
- Replace the crankshaft bearings if needed.
- To replace them, remove the bearing inner ring from the crankshaft by heating the tool R464, and then applying it to the inner ring.

WARNING

Heat up only the tool; do not heat the bearing ring directly!

WARNING

The radial play in the roller bearings must be practically zero.

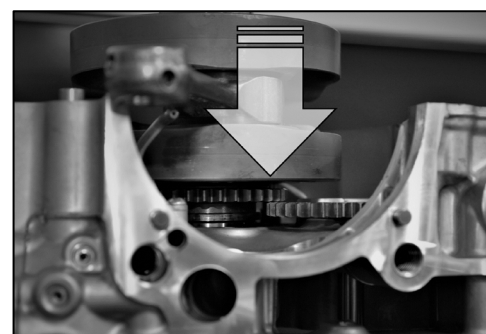
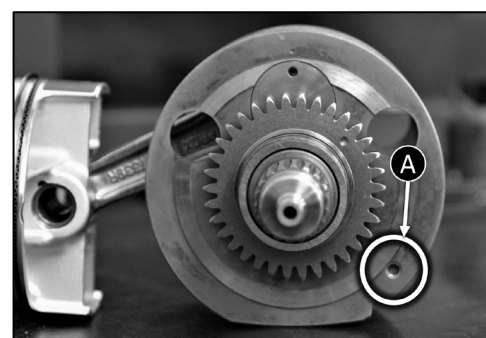
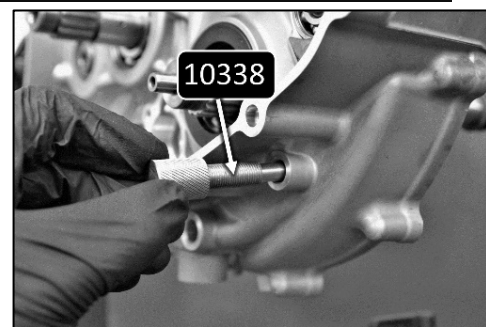


WARNING

*During the rebuild,
replace all
seals & gaskets (paper, O-ring...).*

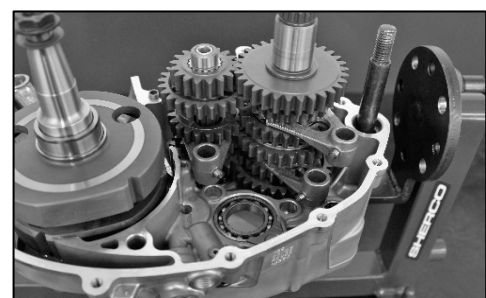
» **Crankshaft / balancer shaft timing:**

- Fully screw the TDC timing tool 10338 into the right-hand crankcase half.
- Install the balancer shaft in the right-hand half case, matching its mark with the one on the crankcase.
- Rest the crankshaft against the TDC timing tool 10338, and rotate it until it engages in the crank web's indexing recess **[A]**.
- Unscrew TDC timing tool 10338 to lower the crankshaft and engage the balancer gear, making sure the timing is correct.



» **Gearbox assembling:**

- Install a new roller on each shift fork.
- Fit both gearbox shafts, not forgetting the thrust washer at the end of the secondary shaft.
- Engage the shift forks in their respective grooves in the gears.



- Install the gearshift drum.
- Place the shift fork rollers in their respective grooves in the gearshift drum, making sure their rollers stay in place.
- Install the shift fork shafts



WARNING

The center fork shaft is the shortest.



WARNING

Do not forget to lubricate all of the rotating and sliding parts.

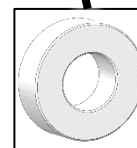
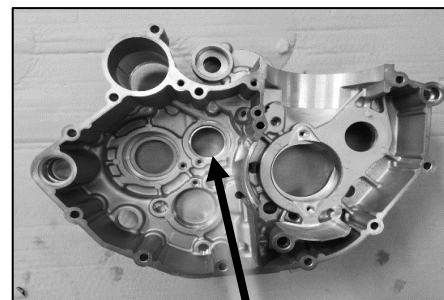
REASSEMBLING CRANKCASES

WARNING:

Crankcase or gearbox replacement on the 250-300 SEF engines requires checking the end play of the primary shaft, and adjusting if needed.

CHECKING THE PRIMARY SHAFT END PLAY

- Fit the tool 8945 in the left crankcase, instead of the primary shaft bearing 0874.
- Install the primary shaft, the gasket, the three dowel pins and close the crankcase, tightening all **13 screws to 10Nm**.

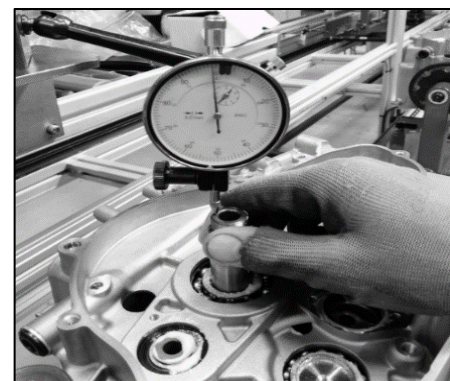


- Using a dial indicator, check the end play of the primary shaft.

WARNING

Make sure the primary shaft rotates freely.

- Remove the right side crankcase and remove the tool. Adjust the end play placing a shim washer between the crankcase and the bearing 0874.



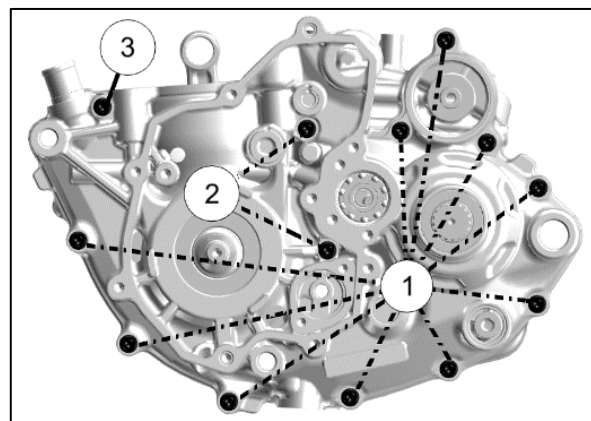
The end play must be between 0 and 0,1mm.

Shim washer	
Thickness	REF
0,5mm	8920
0,4mm	8921
0,3mm	8922
0,2mm	8923
0,1mm	8924

• » Reassembling main crankcase

- Fit a new crankcase gasket, the three centering dowel pins and fit the left half-case on the previously assembled set.
- Screw in the 13 main crankcase screws; refer to the table for screw lengths.

Torque the 13 main crankcase screws to: 10 Nm.

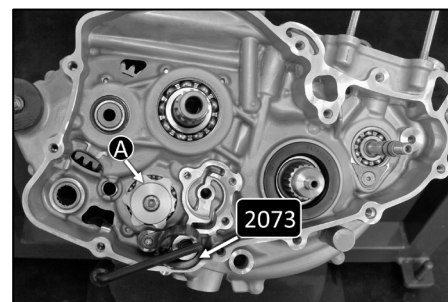


N°	L	QTY	REF.
1	M6X50	10	3235
2	M6X70	2	3826
3	M6X60	1	0551

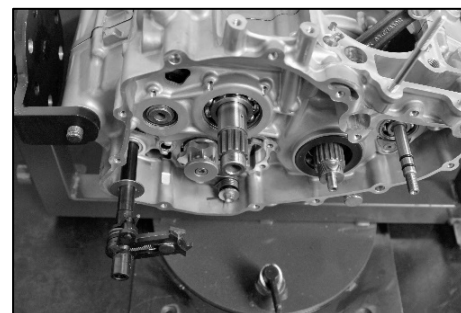
- Fit lock ring M171 onto drive shaft end.
- Using the 2073 tool, hold the gearshift locking finger down.



- Fit the gearshift drum plate [A] with its pin, and the screw with medium threadlocker.

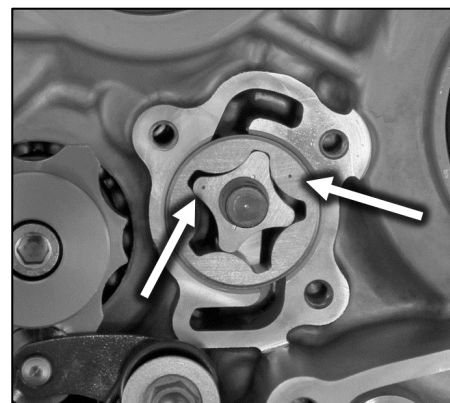


- Remove the tool 2073.
- Install the gear selector shaft, with its washer towards the inside of the engine.

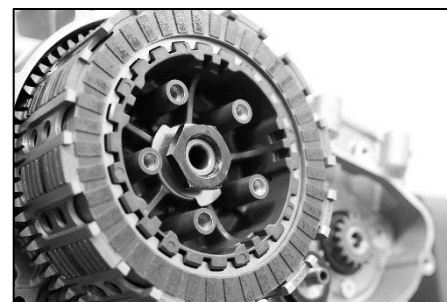
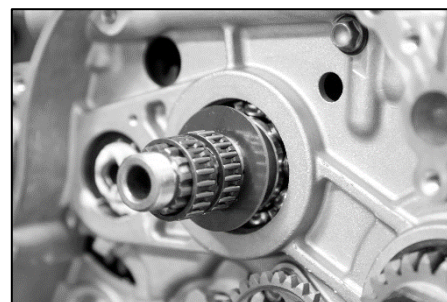


REASSEMBLING CRANKCASES

- Install the oil pumps shaft, its drive pin and the right-hand side oil pump, with the rotor markings facing outwards.
- Fit the oil pump cover, and tighten the screws to **7Nm** with medium threadlocker.
- Install the drive pin, the drive gear, the washer and its lock ring.



- On the transmission input shaft install the thrust washer, the needle bearings, the clutch basket, the splined washer and the clutch hub.
- Degrease the crankshaft and the input shaft threads.
- Install the lock washer, put medium threadlocker on the threads and fit the primary drive nut.

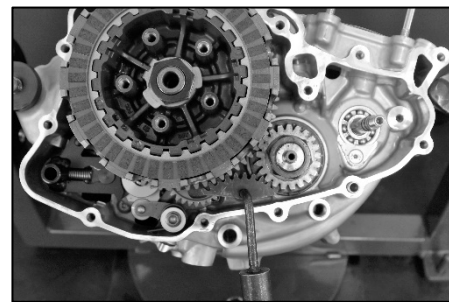


REASSEMBLING CRANKCASES

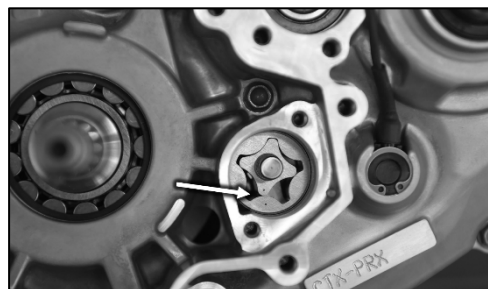
- Install special tool 1817 and torque the crankshaft gear nut.

Torque the crankshaft gear nut to: 120 Nm.

- Reassemble the clutch set.
(see “reassembling the clutch components” chapter)

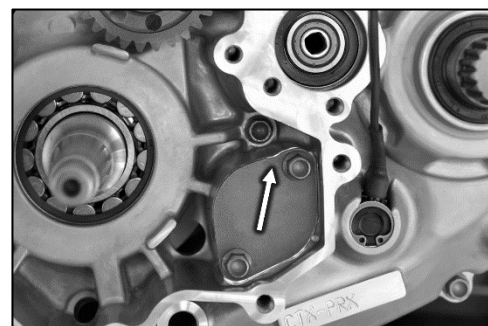


- Fit the two oil pumps with their drive pins on the left-hand side, with the rotor markings facing outwards.



- Fit the oil pump cover with medium threadlocker, paying attention to the direction, its notch is shown by the arrow:

Torque of the oil pump cover: 7 Nm.



- Install the engine starter
- Install the top-end (see “reassembling the top-end” chapter)
- Fit the freewheel assembly and starter gear.
- Install the spark plug.

Torque the spark plug to: 15 Nm.

WARNING

Apply thread locker to all of the internal engine threads except the 5 clutch pressure plate screws.

TIGHTENING TORQUES

STANDARD TORQUE		THREADLOCKER
M5	6 Nm	
M6	10 Nm	
M8	24 Nm	
M10	40 Nm	
MOTOR TIGHTENING TORQUES		THREADLOCKER
Magnetic drain plug	15 Nm	
Drain plug with prefilter	15 Nm	
Oil filter cover	15 Nm	
Spark plug (with copper grease)	15 Nm	
Bolt for bleeding cooling system	6 Nm	
Ignition sensor screw	8 Nm	•
Bolt for draining cooling system	6 Nm	
Clutch slave cylinder screw	9 Nm	
Exhaust bolt	10Nm	
Cylinder head M10 screws : 1 st step 2 nd step M6 nuts	30 Nm 45 Nm 10 Nm	
Camshaft cap	10 Nm	
Chain tensioner screw (x2)	10 Nm	
Chain tensioner screw (x1)	10 Nm	
Timing control plug	8 Nm	
Chain guide screw	10 Nm	•
Clutch pressure plate screws	10 Nm	
Water pump cover	11 Nm	
Rotor nut	80 Nm	•
Clutch nut	80 Nm	•
Ignition cover screws	10 Nm	
Crankcase screws	10 Nm	
Gear selector drum screw	10 Nm	
Oil pump cover	7 Nm	
Balancer shaft nut	30 Nm	•



TIGHTENING TORQUES

FRAME TIGHTENING TORQUES		THREADLOCKER
Rear wheel axle nut	100 Nm	
Aluminum sub frame bolts	24 Nm	•
Front wheel axle nut	40 Nm	
Front fork / axle bolts / axle M6	15 Nm	
Brake pad bolt	8 Nm	•
Bottom plate fork bolts	12 Nm	
Upper plate fork bolts	17 Nm	
Motor screw	60 Nm	
Swing arm nut	100 Nm	
Cylinder head-frame screws	23 Nm	

THROTTLE BODY

Cleaning the throttle body

› Required tools

- MOTUL Net Carb or parts cleaner
- 2,5 mm Allen key
- Screwdriver with 7mm socket
- 8mm wrench



› Removing the throttle body

- Remove the seat
- Remove the fuel tank
- Remove the throttle body clamps
- Remove the throttle body cover
- Remove the throttle cable
- Remove the throttle body

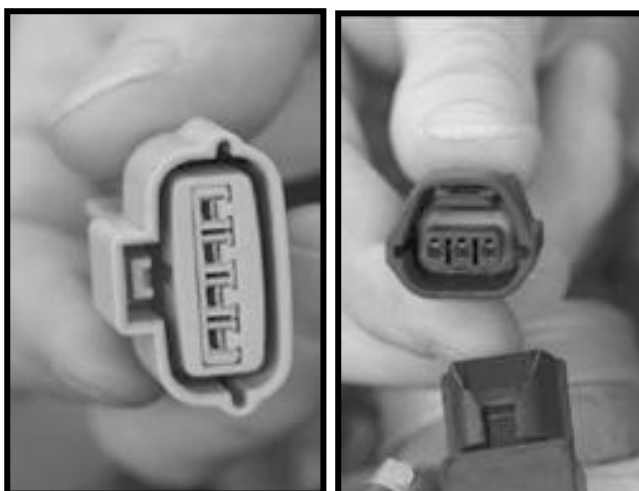


THROTTLE BODY

- Disconnect each connector.
- Visually inspect the connectors.



- Clean with carb cleaner or universal product cleaner.
- Blow out with compressed air.



THROTTLE BODY

›) Cleaning of throttle body

- Clean the throttle body with Net Carburetor
- Make sure you clean perfectly the edges of the butterfly valve on each side by opening it completely.
- Clean the injector.
- Blow out with compressed air.



›) Replace the throttle body

- Put back all the parts together, put some connector grease inside the electrical connectors (TPS plug, injector plug)

If you remove the throttle body manifold, make sure to fit it back the right way.



- Set the throttle cable
- Disconnect the ECU connector. Inspect it
- Clean with carb cleaner or universal product cleaner
- Blow out with compressed air.



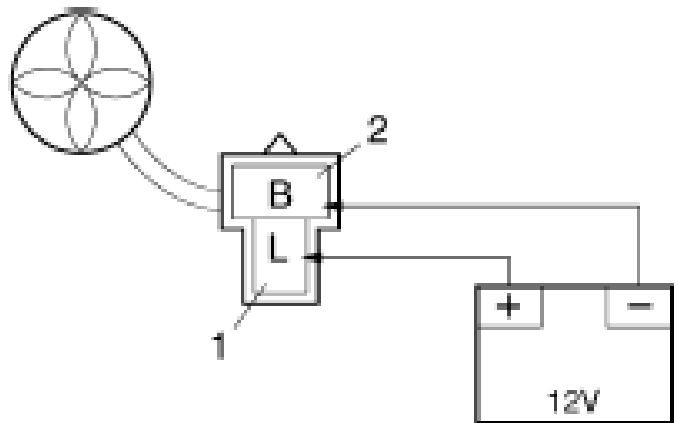
- Apply connector grease.



ELECTRICAL INSTALLATION CHECKING

1- Fan control

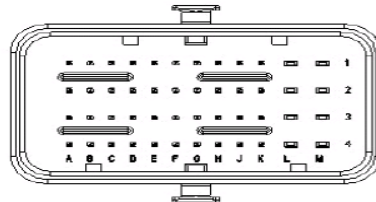
- Disconnect the fan wiring harness.
- Connect a 12V battery directly to the fan has shown on the diagram.
- Make sure the fan turns correctly without any hard point or unusual noise.



2-CDI

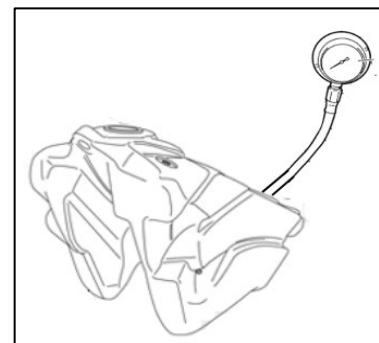
1	VSENS	CAN_H	CAN_L	CPS -	CPS +	protecte d	protecte d	protecte d	protecte d	Main Relay	VBR	IGN
2	ACC_R	Rpm Gauge	Canister Purge	TSW	protecte d	MAP	SGND2	protecte d	Stop SW	FAN Motor (optional)	Hego HEATER	protecte d
3	ACC_L	MIL	SGND1	STA2	ground	TIA	TPS	VEH SPEED	protecte d	FUEL pump	PGND	PGND
4	VBK	VBD	STB2	STA1	STB1	TCO	Hego lens	protecte d	Carb SW	protecte d	INJ (I)	PGND
A	B	C	D	E	F	G	H	J	K	L	M	

Grounds
Supplies
Logic or Freq inputs
VR Freq inputs
Freq outputs
Analog inputs
Logic or Analog inputs
Communications lines
1A outputs
ATM36 outputs
ignition



3-Fuel pump control

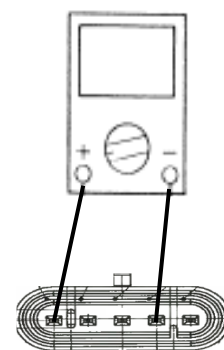
- Disconnect the fuel pump hose and connect the pressure measuring tool ref: **8691**.
- Pressurize the pump by operating the starter.
- A constant pressure of **3 bars** must be measured.



Fuel pump supply control:

- Connect a multimeter between the positive terminal of the pump (green wire) and the negative terminal of the pump (blue wire).

Supply voltage 12V



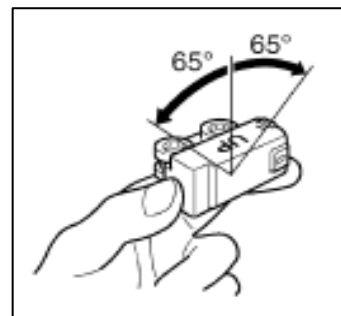
›| 4-Tilt sensor control

- Remove the sensor from its location, leaving it connected to the electrical harness.
- Using a multimeter, measure the output voltage of the angle sensor. Positive plug on the blue wire and negative on the black wire.

Sensor values:

Under 65°: 0.4 – 1.4V

Over 65°: 3.7 – 4.4 V



›| 5-Checking the voltage regulator

- Voltage regulator :

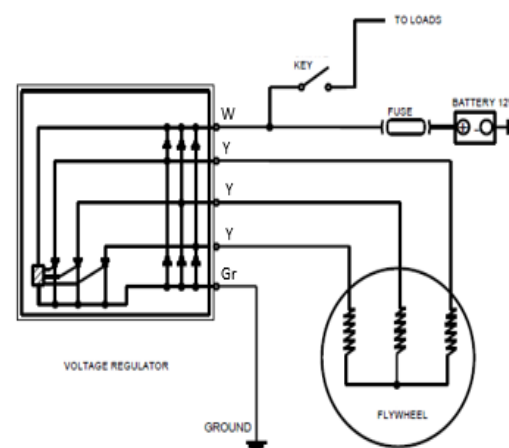
On regulator output (White wire)

At 3500 Rpm: 14.4V +/- 0.5V

- Diode bridge rectifier check :

Connect a multimeter between the positive (white wire) and each of the phase (yellow wire).

Resistance should be noted in only one way of measurement.



›| 6-Battery control

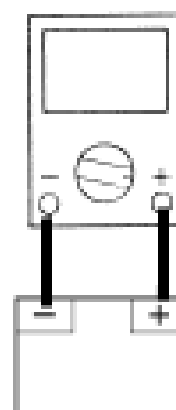
- Connect a multimeter to the + and the – terminals of the battery and check its voltage

Value readings:

12.8V → Charged battery

12.7V or under → Charge battery

Under 12V → Replace battery



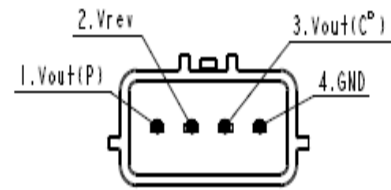
7-Map sensor control

- Check the output voltage of the sensor.
- Connect the multimeter to the sensor (harness side) between terminal N°3 (positive) and terminal N°4 (negative).

Then, between terminal N°1 (positive) and terminal N°4 (negative).

Sensor output voltage:

Between 3 and 5 V



8-TPS control

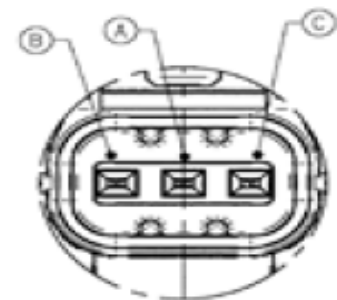
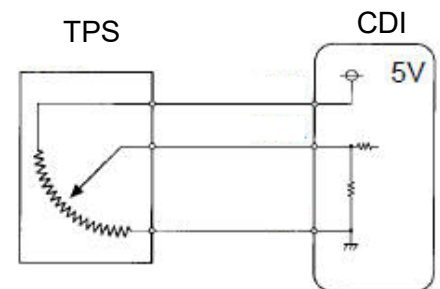
- Measurement of the output voltage of the TPS sensor.
- Connect a multimeter to the output terminals of the TPS sensor (Positive [B] – negative [A]) by keeping it in the fully closed position:

TPS sensor output voltage: 0.4V – 0.6V

- TPS sensor input voltage measurement.

Connect a multimeter to the input terminals of the TPS sensor (Positive [C] – negative [A]).

TPS sensor input voltage : 5V



- Measurement of the resistance TPS sensor:
- Remove the throttle body and measure the resistance directly across the sensor.

Closed butterfly valve :

Between ⊕ (red) and ⊖ (black): 5 +/- 20%

Between signal (blue) and ⊖ (black): 1,25 ~ 1,55

Between signal (blue) and ⊕ (red): 5.3 +/- 20%

Open butterfly valve :

Between ⊕ (red) and ⊖ (black): 5 +/- 20%

Between signal (blue) and ⊖ (black): 4.6 +/- 20%

Between signal (blue) and ⊕ (red): 2.05 +/- 20%

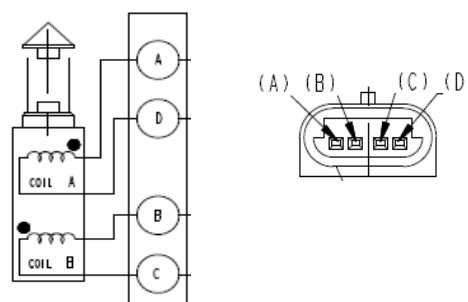


9-Stepper motor control

- Checking the stepper motor coils.
- Connect the multimeter to the sensor (harness side) between terminal [A] and terminal [D].

Then, between the terminal [B] and terminal [C].

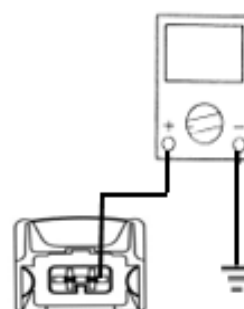
There must be electrical continuity between the terminals; if not, replace the motor.



10-Injector control

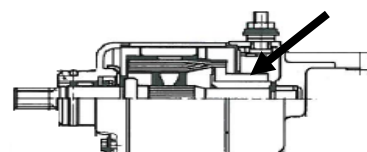
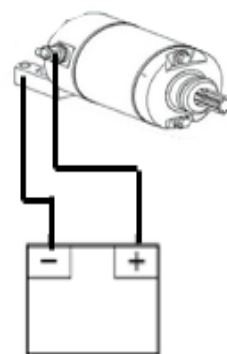
- Measure the input voltage of the injector.
- Connect a multimeter between the green supply wire and the earth.

Injector supply voltage : 12V



11-Starter control

- Remove the starter and clamp it in a vise.
- Connect a battery directly to the starter (⊕ on the starter terminal, ⊖ on the starter body) as shown on the diagram.
- In case of unusual operation, open the starter body to clean the contact between the brushes and the commutator.



12-Checking the alternator

Checking the resistance of the alternator windings:

Connect the multimeter between each phase of the alternator (yellow wire) and measure the resistance.

Winding resistance: $0.44\Omega \pm 15\%$

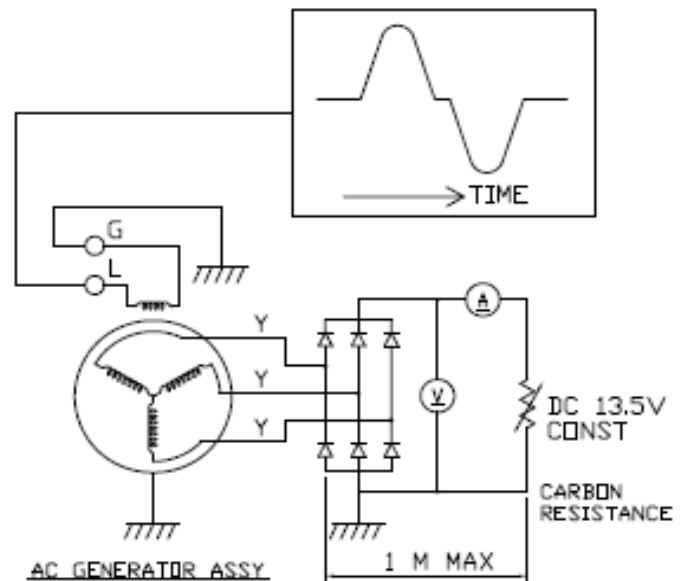
Checking the alternator output voltage:

Connect the multimeter between each phase of the alternator (yellow wire) and ground (multimeter in AC position)

Measure the output voltage.

At idle speed: $22V \pm 2V$

At 6000 rpm: $77V \pm 3V$



13-Hall sensor control (Crankshaft)

Sensor resistance check:

Connect the multimeter between the blue and green wires of the sensor and measure the resistance.

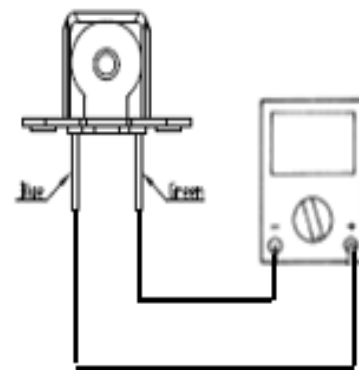
Sensor resistance: $120\Omega \pm 10\%$

Check the output voltage of the sensor:

Connect the multimeter between the blue wire and the ground $\ominus$, and check the voltage.

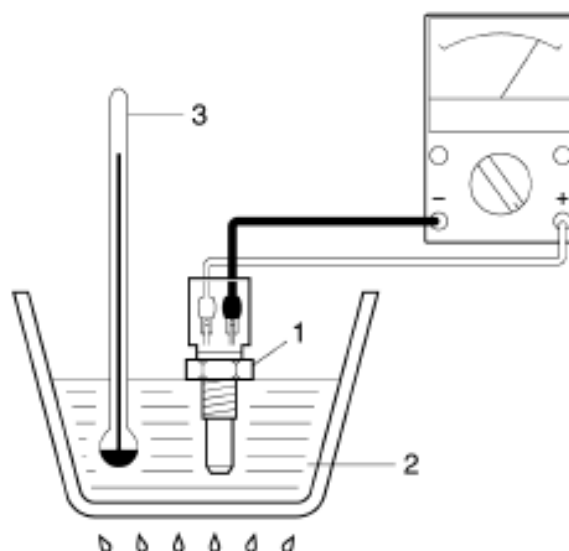
At 300 rpm: 1.7V minimum

At 10000 rpm: 120V maximum



14-Water sensor control

- Drain the coolant.
- Remove the temperature probe.
- Immerse the sensor ① in a container filled with coolant ②.
- Immerse a thermometer ③ in the liquid to monitor 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, referring to the table below.



TEMP (°C)	RESISTANCE (Ω)
25	3000
30	2415
40	1620
50	1081
60	748
70	528
80	379
90	278
100	206

15-Ignition coil control

- Checking the resistance of the primary coil.

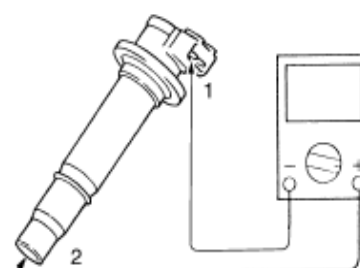
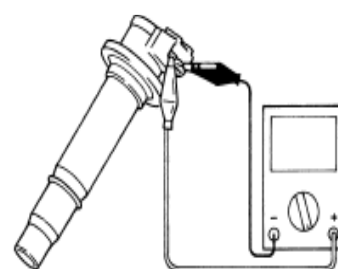
Connect the multimeter as shown in the diagram and measure the resistance.

Primary winding resistance :
Between 0.85 and 1.5 Ω

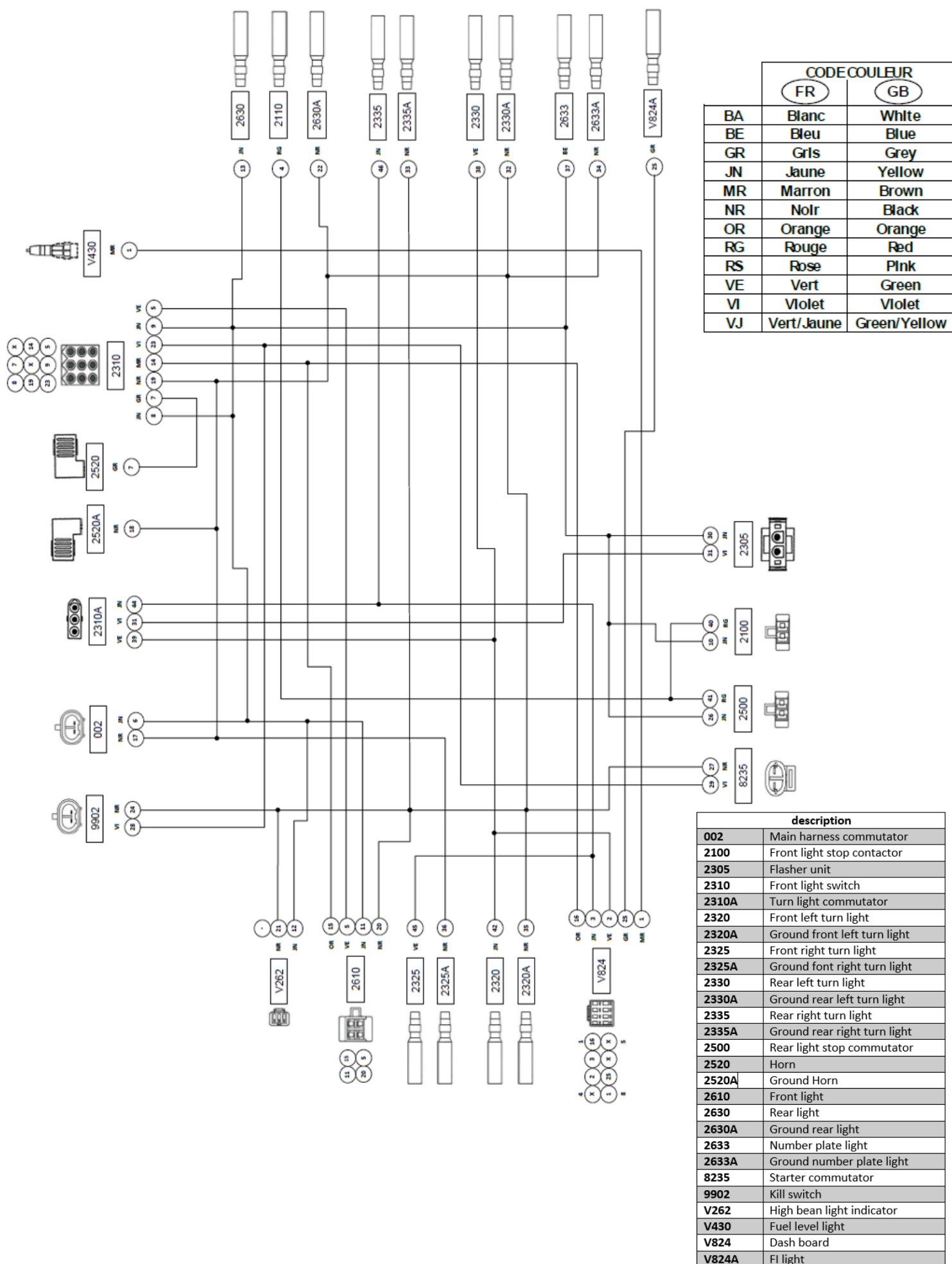
- Checking the resistance of the secondary coil.

Connect the multimeter as shown in the diagram and measure the resistance.

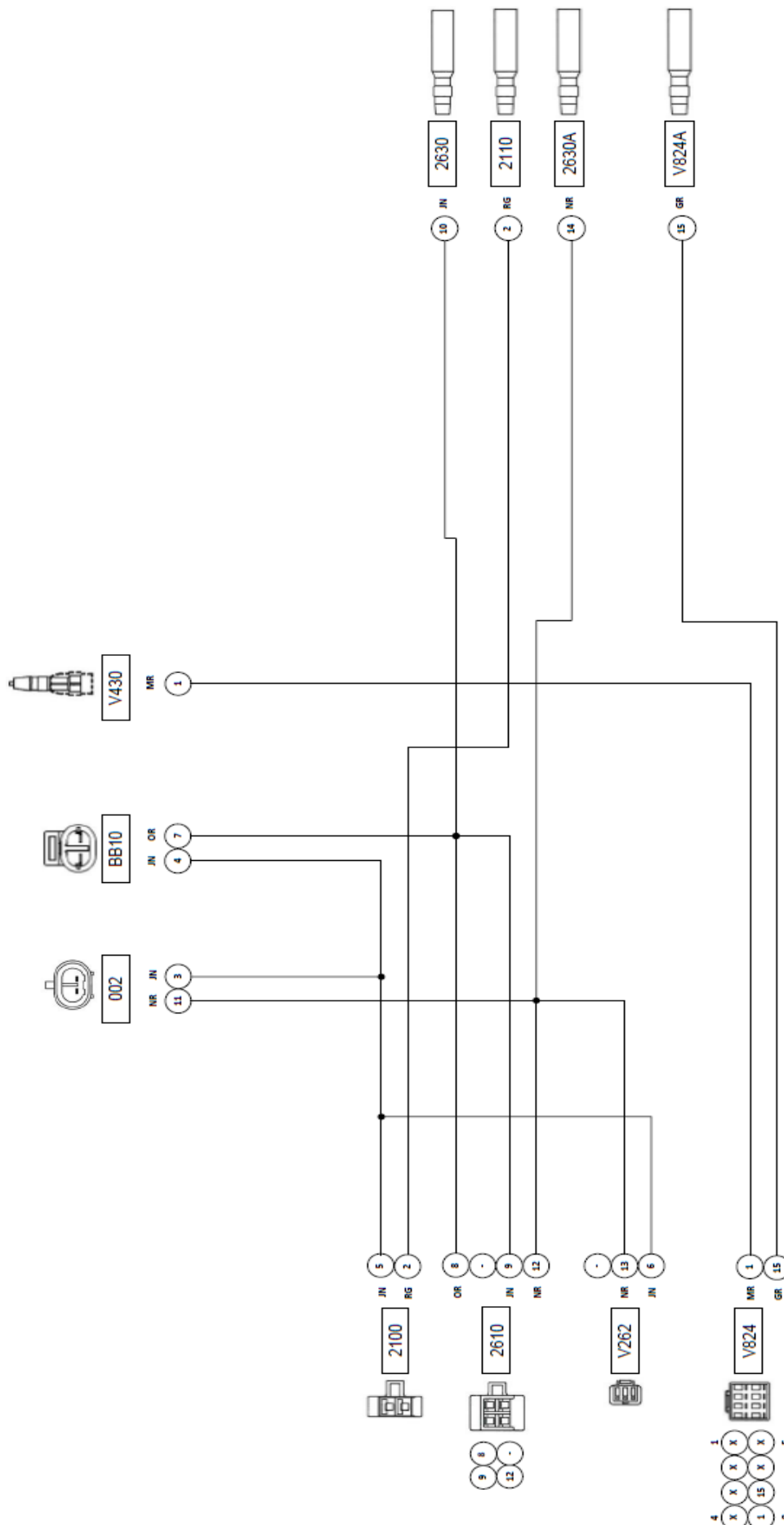
Secondary coil resistance :
Between 10 and 14 KΩ



Homologated lights wiring diagram (8145)



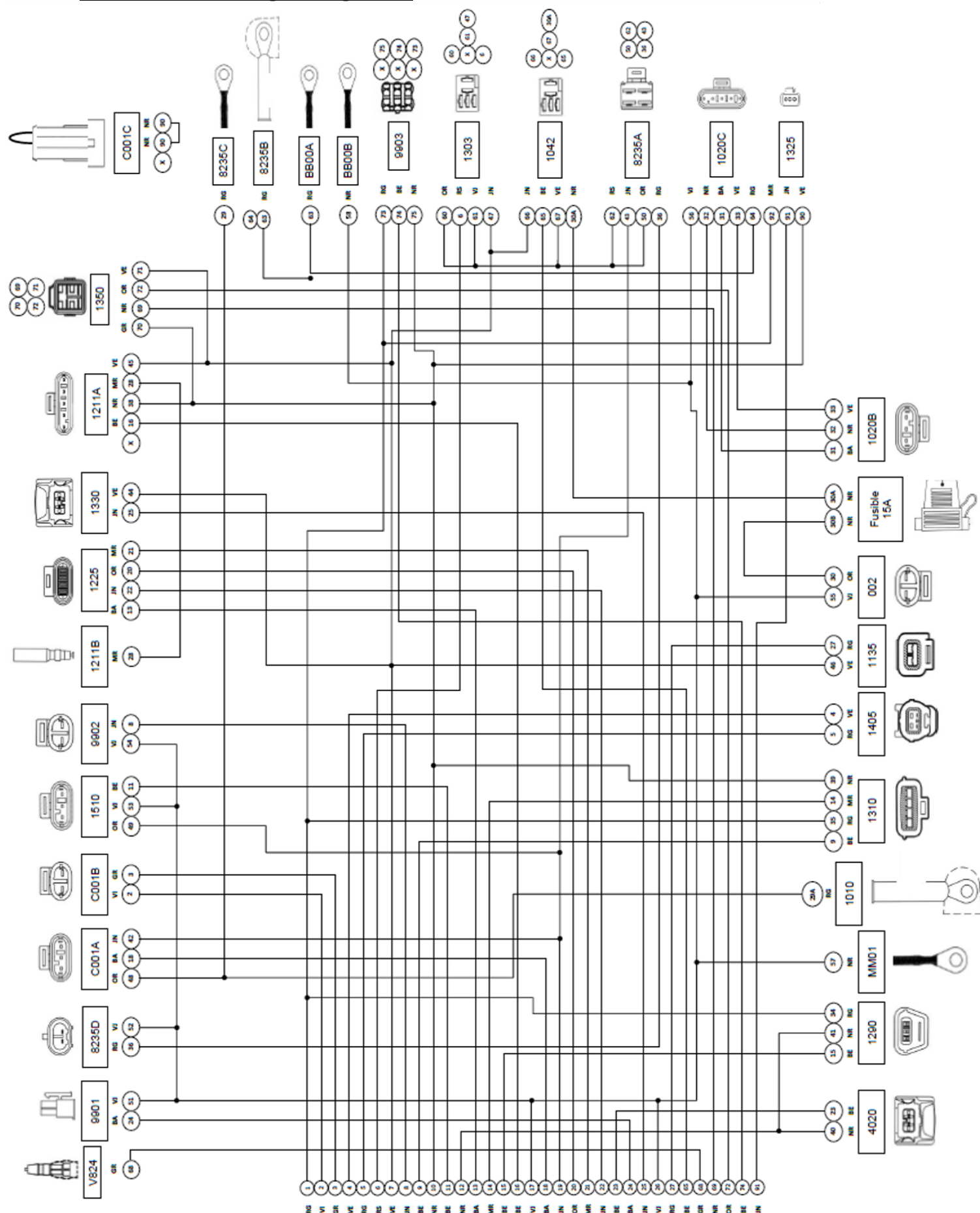
»I Racing lights wiring diagram (6845)



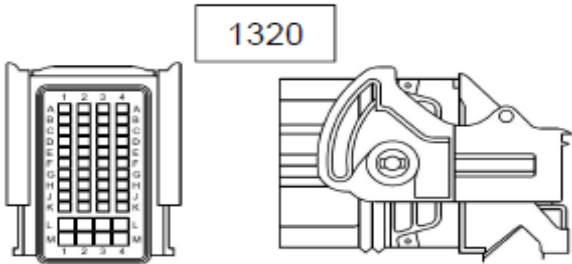
	CODE COULEUR	
	FR	GB
BA	Blanc	White
BE	Bleu	Blue
GR	Grfs	Grey
JN	Jaune	Yellow
MR	Marron	Brown
NR	Noir	Black
OR	Orange	Orange
RG	Rouge	Red
RS	Rose	Pink
VE	Vert	Green
VI	Violet	Violet
VJ	Vert/Jaune	Green/Yellow

description	
002	Main harness commutator
2100	Front brake light contactor
2110	Stop rear light
2610	Front light
2630	Rear light
2630A	Ground light
Bb10	Light switch
V262	High beam light indicator
V430	Fuel level light
V824	Dash board
V824A	FI light

» Main wiring diagram (11549)



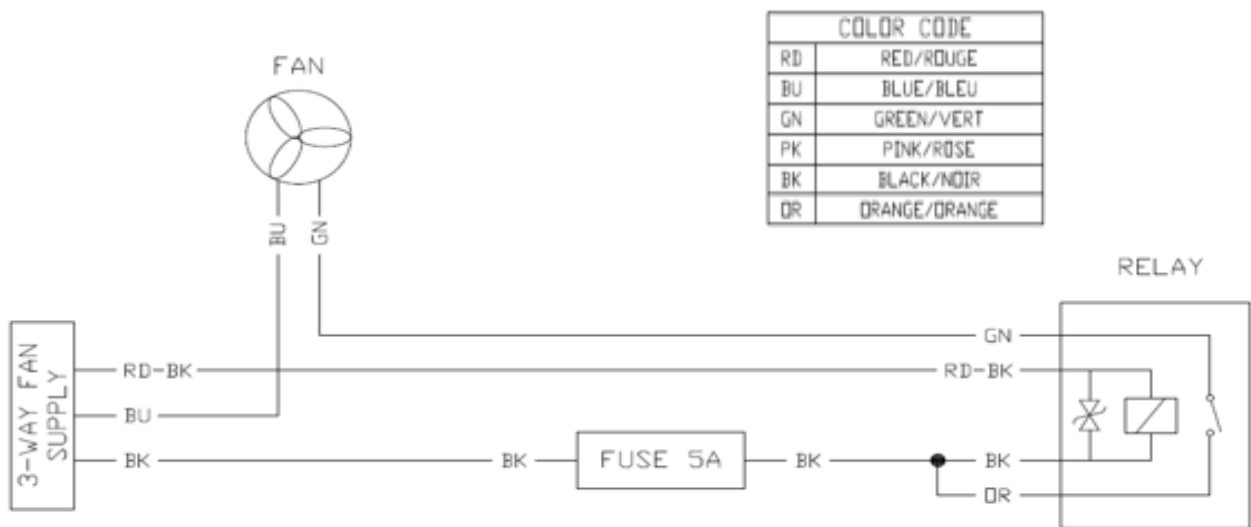
WIRING HARNESS



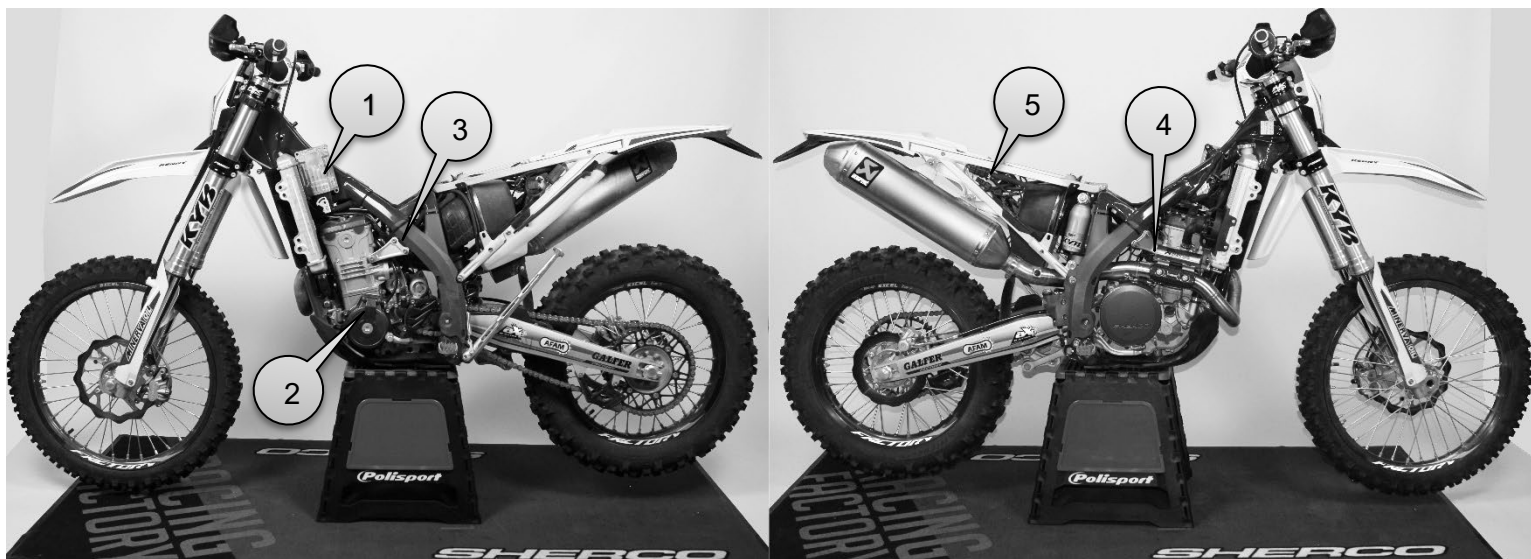
	1	2	3	4	
A	1	X	65	18	A
B	2	X	68	19	B
C	3	X	12	20	C
D	4	74	13	21	D
E	5	X	X	22	E
F	X	9	14	23	F
G	X	10	15	69	G
H	X	X	X	X	H
J	X	8	X	24	J
K	6	11	X	X	K
L	7	72	16	25	L
M	27	X	17	26	M
	1	2	3	4	

	Description
002	light harness commutator
1010	Starter
10208	Alternator
1020C	Regulator
1042	light relay
1135	Ignition coil
1211A	Fuel pump
12118	Fuel gauge
1225	Stepper
1290	TPS
1303	Ignition relay
1310	Air flow sensor
1320	ECU
1330	Injector
1350	Oxygen sensor
1405	TDC sensor
1510	Fan motor group
4020	Cooling sensor
8235A	Starter relay
82358	Starter battery commutator
8235C	Ground starter commutator
82350	Engine starter commutator
9901	Switch Map
9902	Kill switch
9903	Tilt Sensor
8800A	Battery
COOIA	Shunt
C0018	Diagnostic tool conn ector
COOIC	Shunt
V824	Fl light
Fusible	Fuse 15A
MMOOI	Ground
BB00B	battery ground
1325	engaged gear sensor

» Fan wire harness (3577)



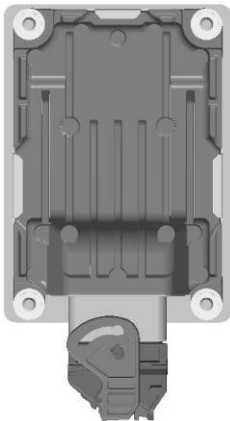
SYNERJECT INJECTION SYSTEM PRESENTATION

1.1- Injection system

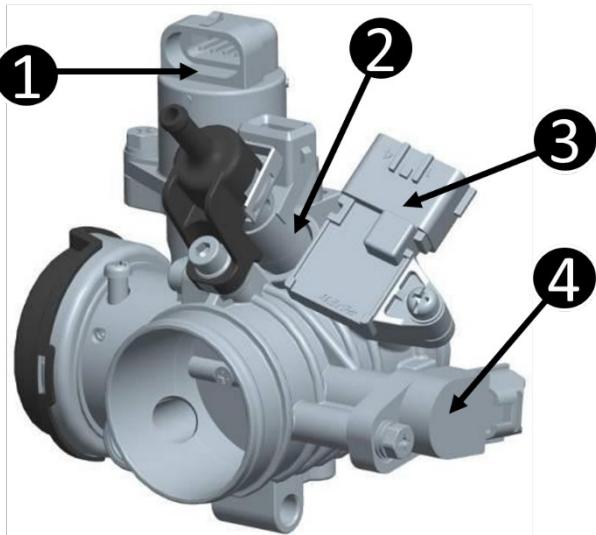
Your Sherco is equipped with a Synerject injection system that is composed of a M3C computer, a Ø 42mm throttle body, a special ignition system and a special harness.

N°	DESIGNATION	EMPLACEMENT
1	Synerject M3C Computer	Left side of the frame top tube
2	Engine speed sensor (pick-up)	Upper part of the ignition cover
3	Synerject Ø 42mm throttle body	
4	Water temperature sensor	The rear of the cylinder head
5	Diagnosis connector with double water protection (labeled ECU)	At the right rear side panel

Picture 1 : Synerject M3C Computer



Picture 2 : Synerject Ø42mm throttle body



N°	DESIGNATION
1	Stepper motor: Idle and engine braking management
2	Fuel injector
3	TMAP sensor : Air Temperature/Air Pressure
4	TPS: Butterfly valve Throttle Position Sensor



1.2- Description Exxodiag diagnosis Tools référence 4967

The diagnostic tool allows you to perform diagnostic operations, make updates to the injection mapping and to determine certain information (serial number of the motorcycle, number of hours of operation, etc.).

1.3- Diagnosis tool kit contents.

The kit consists of a USB to MUX output cable, a MUX device, a MUX to motorcycle diagnostic connector cable, an installation CD and a user manual.

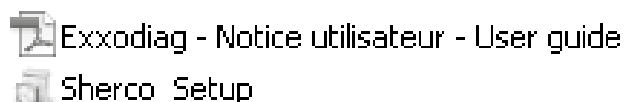
1.4- Installation of the diagnosis tool

In case of problem during the installation please contact EXXOTEST at +33 (0)4 50 02 34 34 or by e-mail at courrier@exxotest.com

A- Installing the software and drivers

- Open the installation CD on your computer

- Run "sherco_setup"



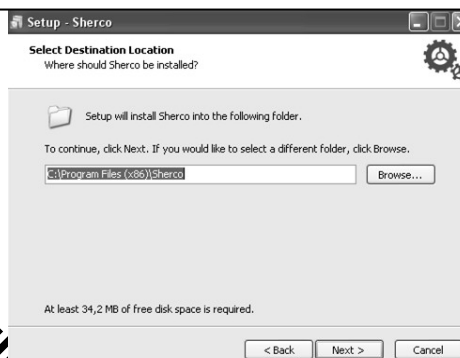
- Select the language.



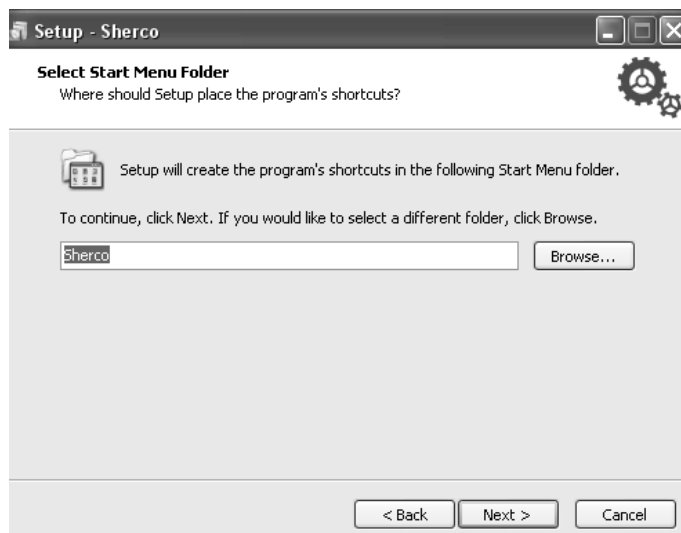
- Click on « Next ».



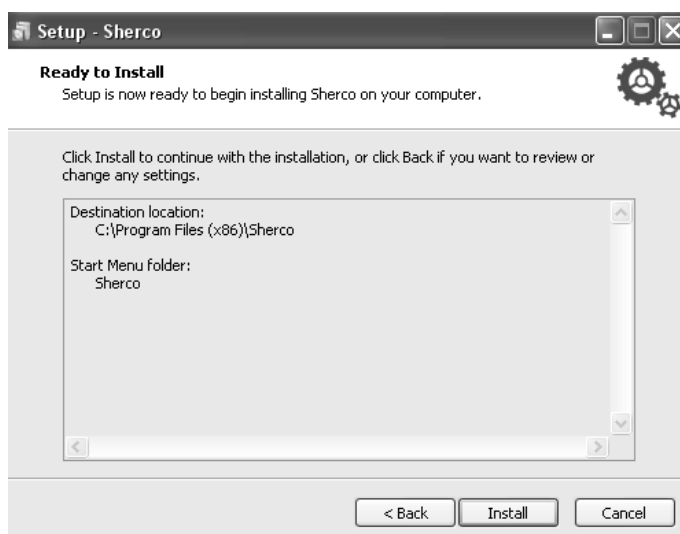
- Choose the installation folder.



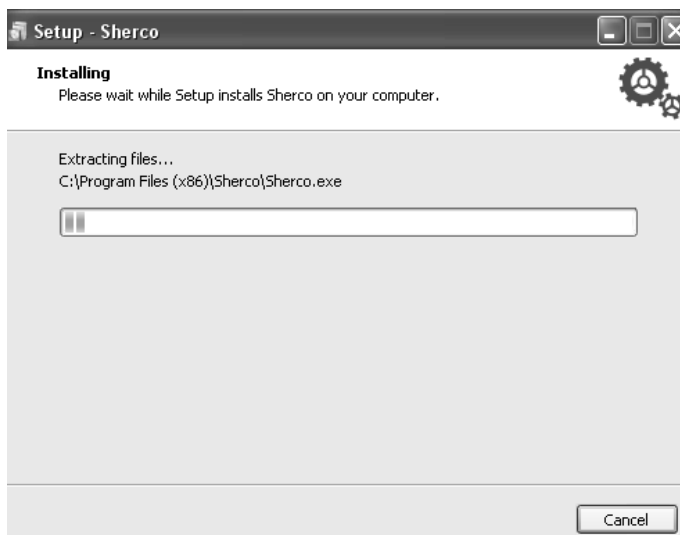
- Click on « Next ».



- Click on « Install ».



- Installation in progress.



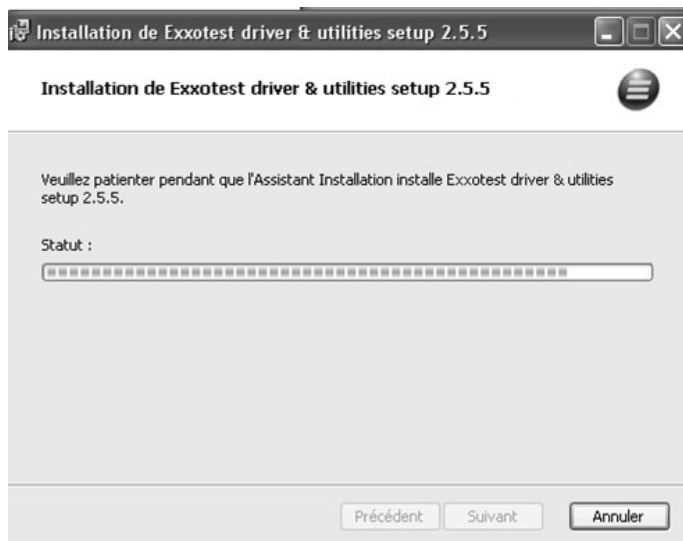
- Check the box « Start the driver installation » and click on « Finish ».



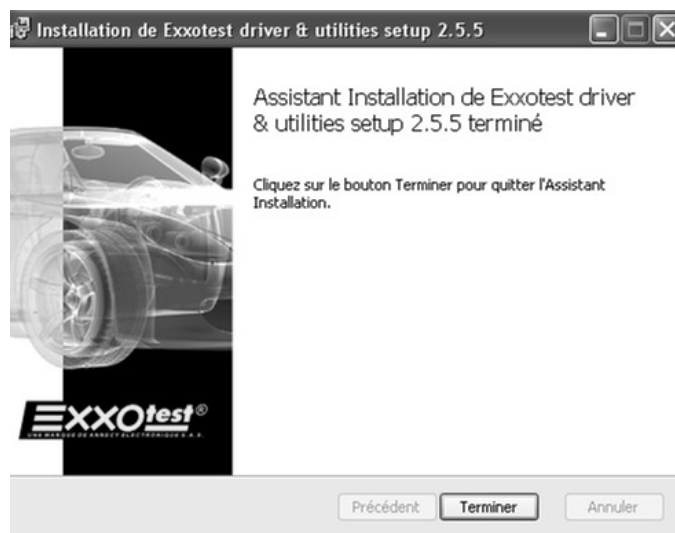
- The following window will open. Read the terms of the license agreement. Check the box « I accept the terms of the license agreement » and click on « Install ».



- Installation in progress.



- The following window will open. Click on « Finish ».



The installation is complete.

B- Connect the « MUXDIAG II » cable and its interface to a USB port on your computer

Connect the cable to the diagnostic connector of the motorcycle.

Make sure the « MUXDIAG II » unit is properly powered by checking the LED :

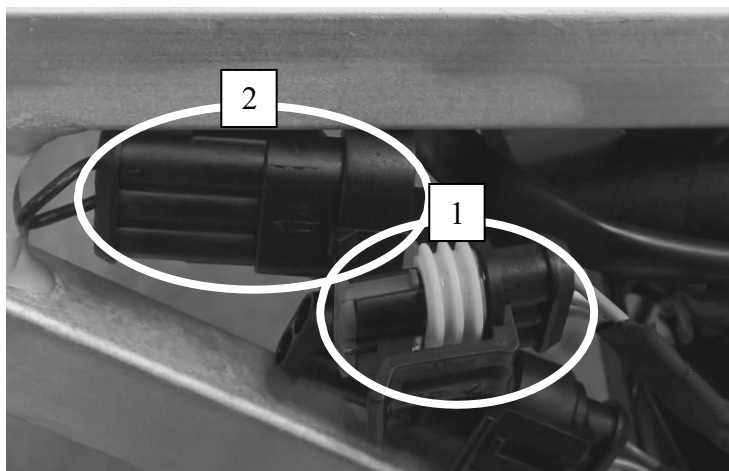
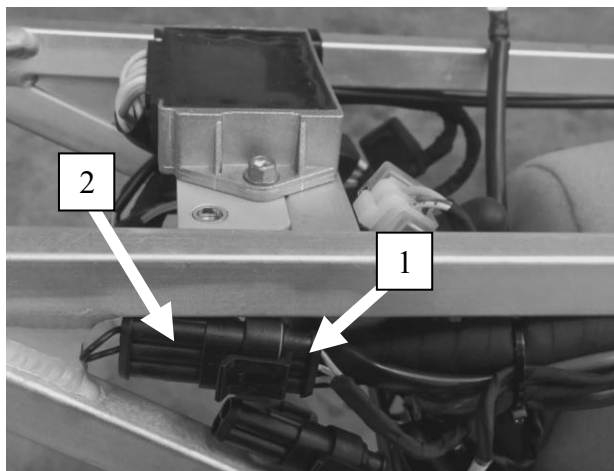
- Solid blue: PC connection properly established.
- Flashing blue: communication with PC in progress.
- Blue off: no connection to the PC, or device in standby; it can also indicate a problem with the USB connector.
- Solid green: firmware issue.
- Flashing green (slow): firmware correctly run.
- Flashing green (fast): communication with PC in progress.
- Green off: no firmware.
- Solid red: correct power supply to the card.
- All LEDs OFF: the outlet is not powered on, or is off or USB in on standby mode.

2.1- Connection with Keyless system

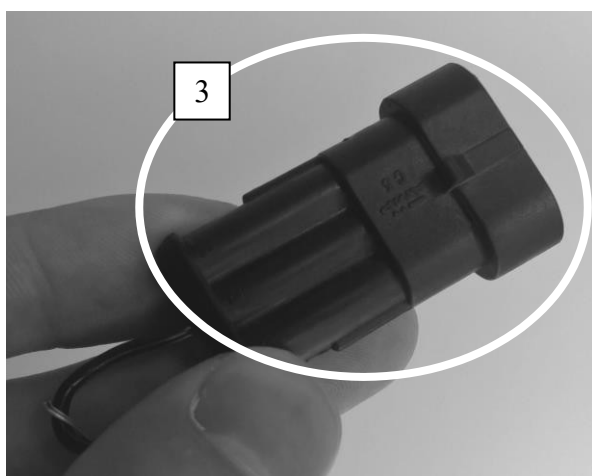
Sherco had a Keyless system on its motorcycles, which allows the bike to switch on without any key and switch off automatically after 30 seconds of non-use.

This last point blocks the diagnosis; this is why it is necessary to rule the following steps down below before doing it.

1. Remove the plug (1) from the connector (2) (located on the rear sub frame – on the right side of the bike).



2. Take the shunt (3) (*reference 6267*) and connect the plug (1) into it.



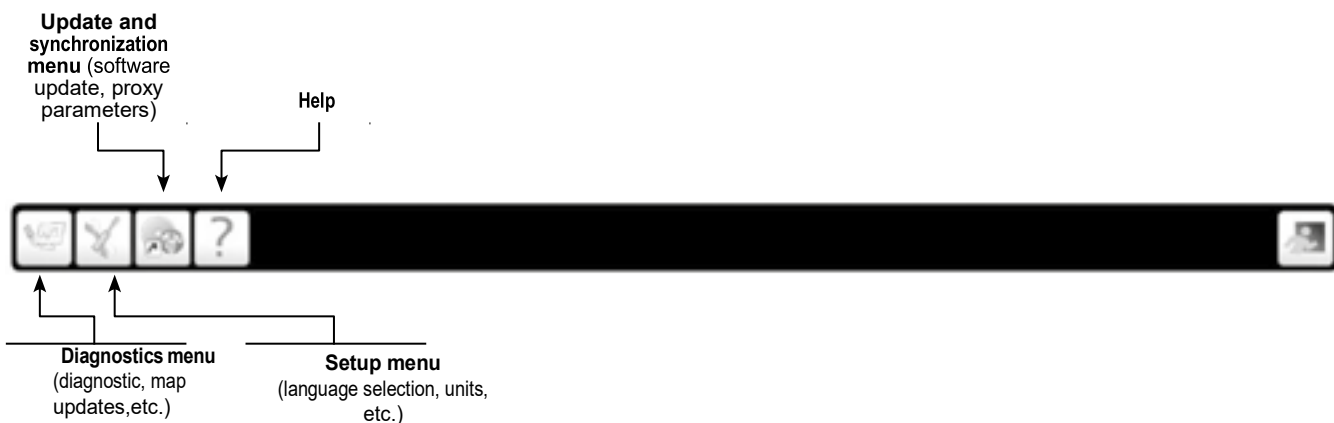
3. You can now do the diagnosis by following the next steps.

Information : To set up the connection with the motorcycle, the motorcycle must be switched on (On). To navigate through the different menus, the USB cable with the «MUXDIAG II» device only may be connected to the computer..

Run the software using the icon



The following menu will come up :



2.2- Software settings : configuration menu



In this menu, you can modify :

Configuration

	Communication peripheral	USB MUX DIAG V2 n°5438	
	Language	English	
	Authorization level	After sales	
	Type of unit	☒ "Default" unit ☐ Equivalent unit	

Sherco v0.08

Configuration

	Communication peripheral	USB MUX DIAG V2 n°5438	
	Language	English	
	Authorization level	After sales	
	Type of unit	☒ "Default" unit ☐ Equivalent unit	

- The diagnostic plug. You can refresh the list by hitting the button. The number must match the number of the « MUXDIAG II » device.
- The languages available in the software: English, French, Spanish, Portuguese, German, Italian (the installation CD provided may not include all languages). Update the software-> page 53).
- Set the unit system.



- Click to return to the homescreen.

- Click to save the changes.



2.3- Update menu and synchronization



A- In this menu, you can update the diagnostic software tool

- To determine whether an update is available, check that you have an Internet connection, and then click on the following icon



- If an update is available, the following window will come up:



- If no update is available, the following message will come up:



- Click on  to start downloading the update.



- The following message will come up
- Click on  to start installation



- Resume the installation process -> page 41. It is not necessary to restart the installation of the drivers

B- Configuration of Internet access parameters

It may be necessary to set up a proxy server to access the Internet.

- Click on 

- Fill in the following settings if necessary.

Configuration of proxy settings

☐ None

☒ Use the following settings

Customized settings

Address / Port		
User		
Password		

- Click on  to save your changes.



2.4- Using the software

Diagnostic menu and injection mapping update



General

- Click on « Sherco ».

Choose vehicle

After sales USB MUX DIAG V2 N°5438		Sherco
---------------------------------------	----------------------	---------------------------------------

- Click on « M3C ».

Choose ECU

After sales USB MUX DIAG V2 N°5438 Sherco		M3C
---	----------------------	------------------------------------

- You get the following menu :

Choose vehicle

After sales USB MUX DIAG V2 N°5438 Sherco M3C	Identification
	Parameter reading
	Trouble codes reading
	Trouble codes clearing
	ECU updating
	Actuator tests

A- Identification

You can check the identification of the following (serial number, hours of operation, calibration number)

Reading of current setting...

Factory USB MUX DIAG V2 N°5438 Sherco M3C	VIN code	VNB5430E32B001821
	Overall engine operating hour counter	0.0 h
	ECU Board Serial Number	2011929783
	Software Version	QR010010
	Hardware Version	S19003704029
	Calibration	25EUS01.

B- Parameter measurements

General parameters (speed, pressure, stepper, etc.)

Choose category...

 After sales
 USB MUX DIAG V2 N°5438
 Sherco
 M3C

Engine information

Throttle Position

Misc

1- Engine information

Displayed below are the main system values:

Reading of current setting...

 After sales
 USB MUX DIAG V2 N°5453
 Sherco
 M3C


RPM

0 tr/mn

Engine Temperature

31 °C

Battery Voltage

11.9 V

Air temperature

28 °C

Ambient pressure

1012 mb

Stepper position

0

Throttle position

0 %

Details:

- Stepper Position: The air valve (stepper) opening value -> $35 < 50 < 75$ If the value is too low: there could be an air leak at the engine air intake If the value is too high: there could be dirt in the injector butterfly area

Note : The correct air valve motor value should be 15mm and 2mm with the motor idling and at 80°C.

- Butterfly position: With the engine stopped it should be 0%: the maximum opening value should be 100%. If the value is not 0% with the engine stopped it means that it needs to be adjusted. Perform a system reset several times (Switch the ignition off. Wait until the ECU relay shuts. Put it on the bike). The pitch should be 0.5%.
- Emergency stop button: the status of the emergency stop button. 0: off, 1: on.
- Engine status: ES (engine ready to start), ST (engine running), IS (engine is at idle), PL (acceleration), PU (deceleration), PUC (injection cutoff deceleration)

2- Other less frequently used values appear in the windows

Throttle position :

- The adjustment value for the minimum throttle butterfly opening should be (in V):
 $0.4 < 0.5V < 0.6$

Miscellaneous :

- Manifold Pressure (mb): pressure at the injector nozzle body measured by the TMAP sensor
- Engine synchronization status: engine cycle recognition. 0: engine not in phase.
1: engine running in phase.
- The full engine idling adaptation (%): not activated function

C- Reading the default codes

When you click on "read default codes" the system starts checking.

Choose vehicle	
After sales USB MUX DIAG V2 N°5438 Sherco M3C	Identification
	Parameter reading
	Trouble codes reading
	Trouble codes clearing
	ECU updating
	Actuator tests

If no default appears, exit the menu by clicking on this icon



If a default appears:

Breakdown list...	
After sales USB MUX DIAG V2 N°5438 Sherco M3C	Fugitive failure Permanent failure
	Throttle Position Sensor (P0122)
	Electric fuel pump (P0231)
	Air pressure sensor (P0107)
	Intake air temperature sensor (P0113)
	Stepper motor (P1508)
	Cooling fan (P0485)

Details of breakdown code...

After sales
 USB MUX DIAG V2
N°5438
 Sherco
 M3C



Throttle Position Sensor (P0122)

Short circuit to ground or overload

- Number of occurrence of present failure = 59
- RPM = 0 tr/min
- Engine Temperature = -40 °C
- Battery voltage = 4.0 V
- Air Temperature = 29 °C
- Ambient pressure = 64 mb
- Applied Ignition angle = -29 °CRK
- Injection Time = 35 ms
- Engine state = ES
- Overall engine operating counter = 0 h
- Engine operating minute counter since last engine start = 237 min
- Throttle Position in degrees = 0 °TPS
- Intake manifold air pressure = 1360 mb
- Mass air flow = 40 mg/tdc
- Adaptive value of integral term of the idle speed controller = -50.00 %

You can get the details of the default by clicking on the default display:
Record the defaults and exit the menu by clicking on this icon



Note :

- 1- Transient default/permanent default: a transient default becomes permanent after a certain number of engine cycles of the following components (injector, fuel pump, etc). For a permanent default to disappear it takes 40 cycles without the engine default reappearing.
- 2- Fan Default : If there is no fan installed on the bike, there will always be a rise in the fan default code (P0485)

D- Erasing default codes

- 1- If a default appears : go to the menu « Erasing default codes »

Choose vehicle

After sales
 USB MUX DIAG V2
N°5438
 Sherco
 M3C

Identification
Parameter reading
Trouble codes reading
Trouble codes clearing
ECU updating
Actuator tests



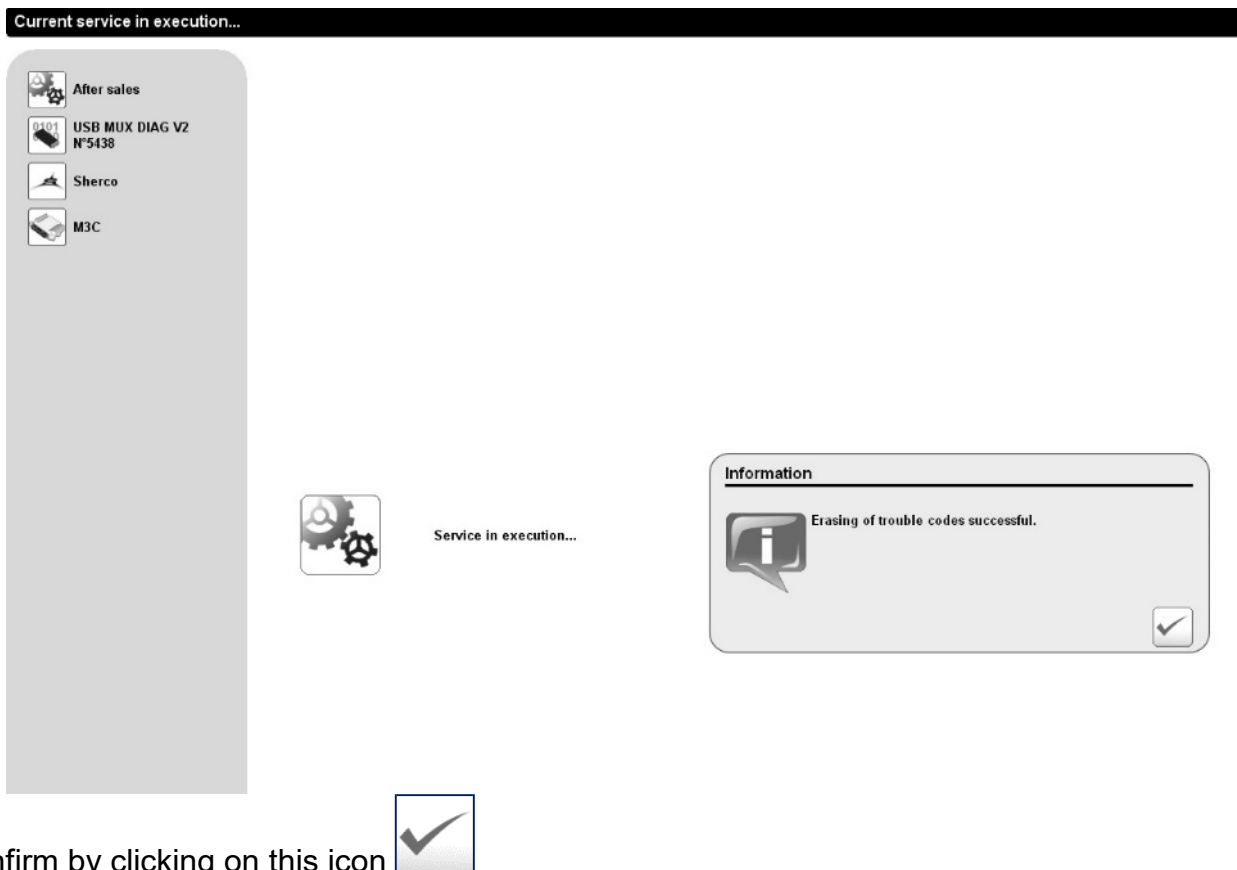
Effacer tous les codes défauts ?

Click this icon

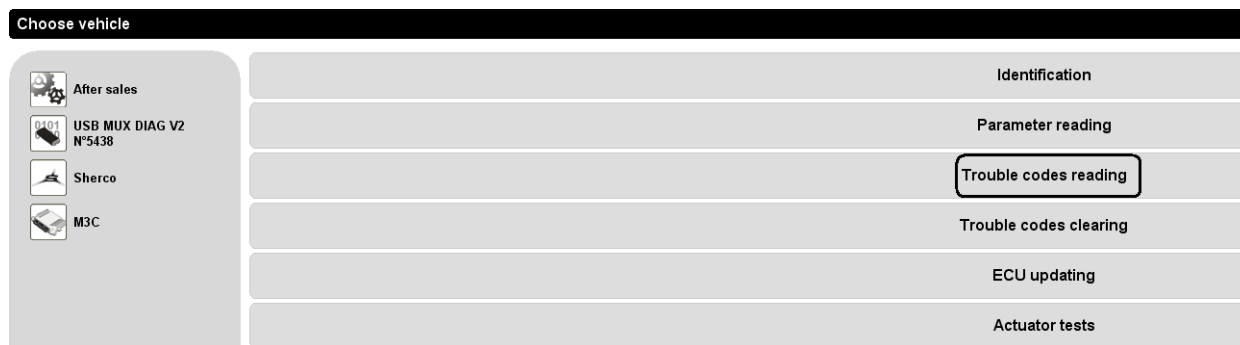


in order to erase all of the default codes

The following screen will appear:



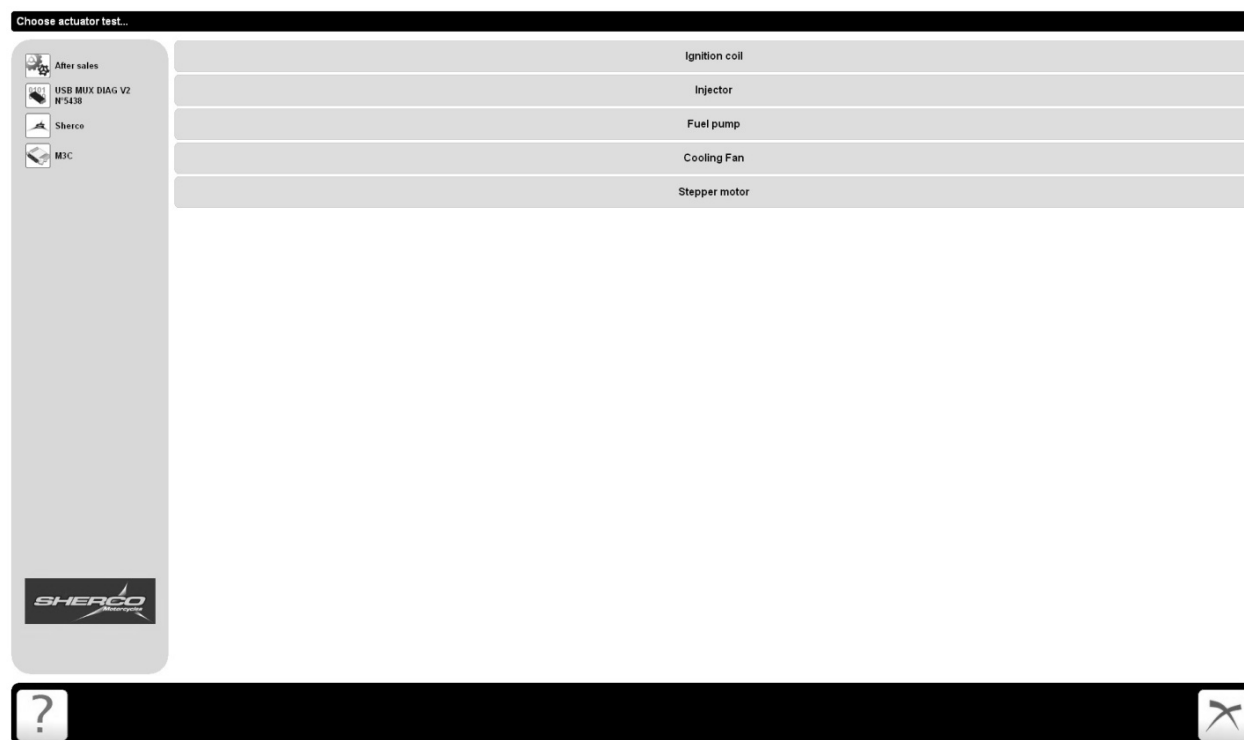
2- Return to the menu « reading default codes »



Check and make sure that the defaults are the same as before. Check/replace the defective parts. Check all of the connections.

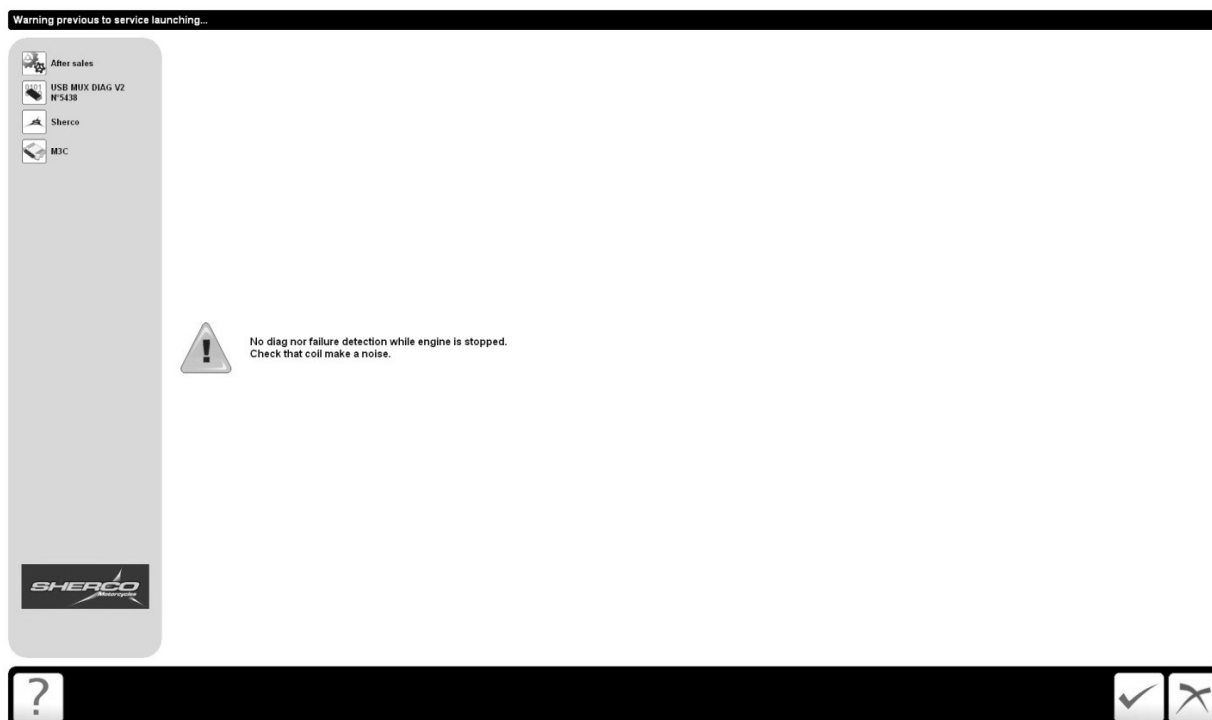
E- Test the actuators

In addition to reading default codes, you can also check some of the system components:

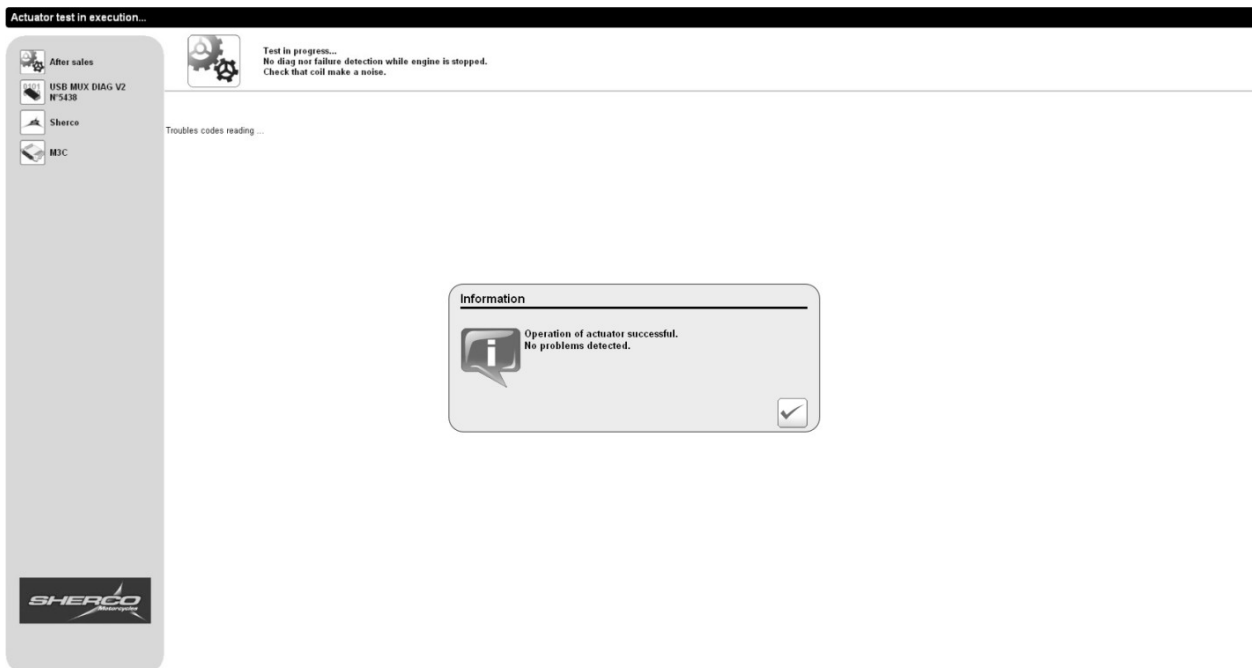


1- Ignition coil

When you launch the ignition coil test, the following message will appear :



The system is not able to detect an ignition coil failure with the engine stopped. The test results will be the same if the coil is faulty or not. Therefore, when testing the ignition coil make sure that the engine makes the correct sound for a properly functioning ignition coil.



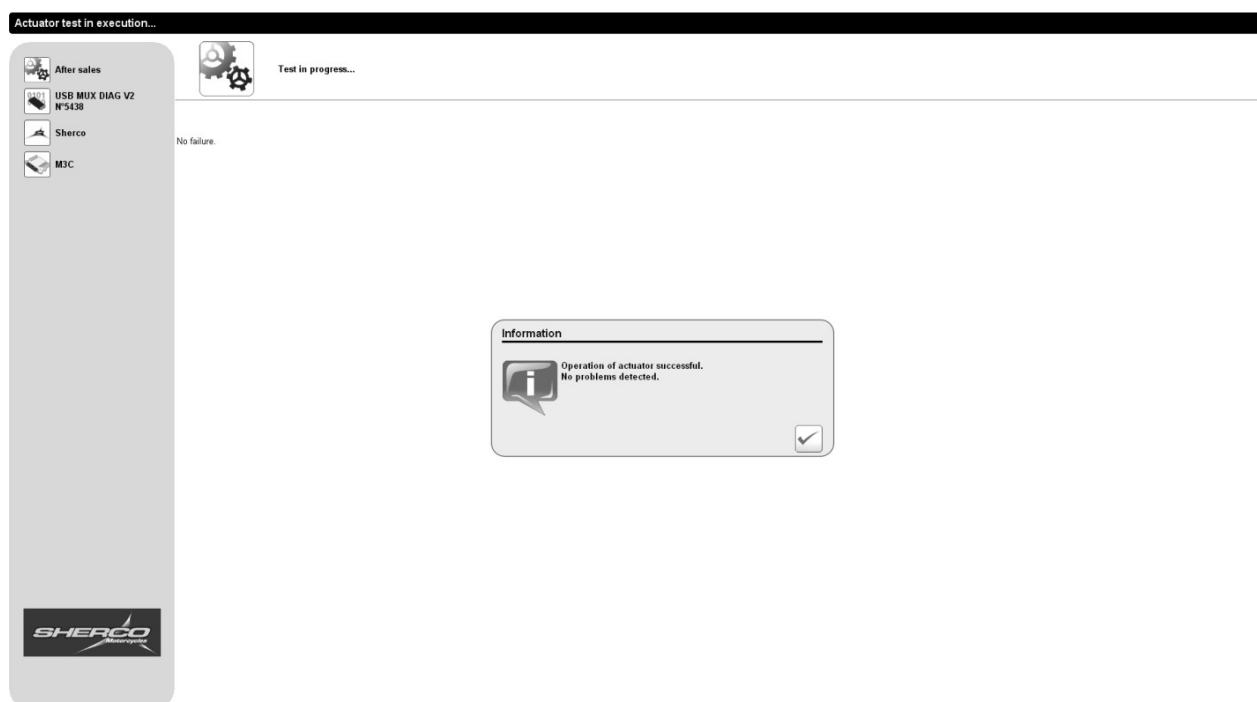
2-Injector

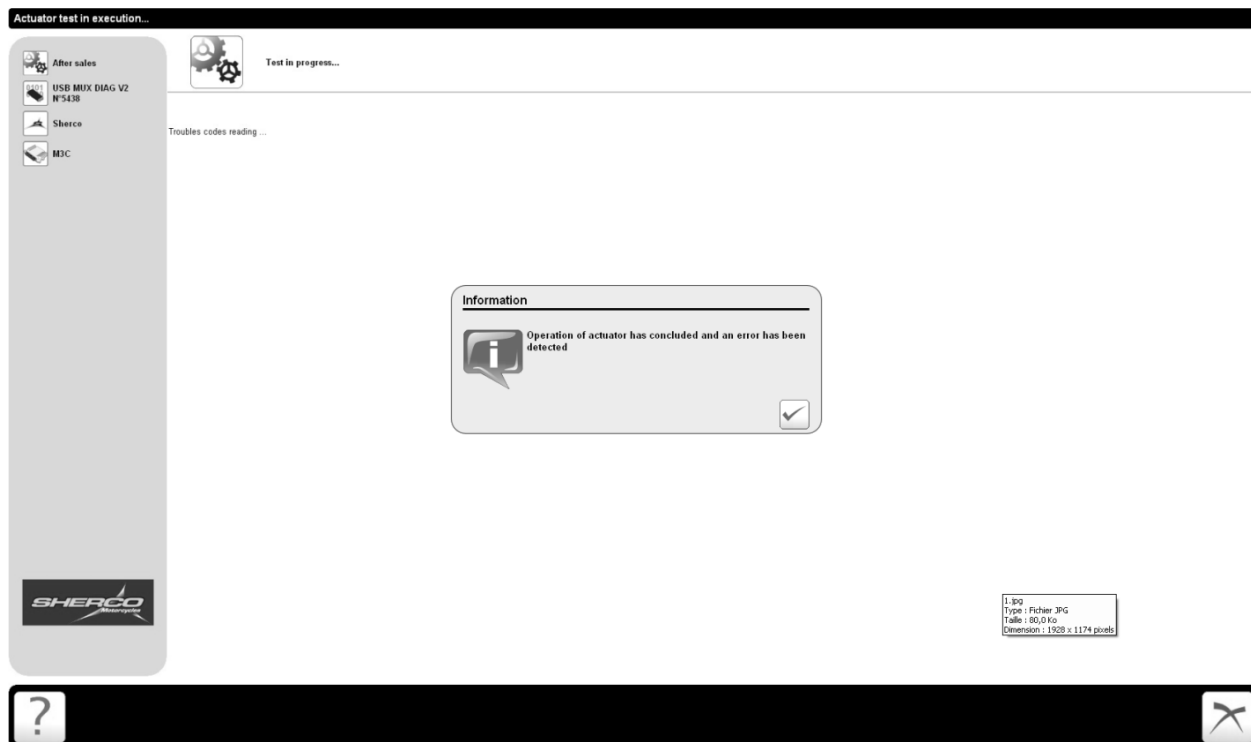
This is the same type of test as with ignition coil. Make sure that the injector issues a snap when activated.

3-Fuel pump / fan / stepper

For the fuel pump, the fan and the stepper (air valve) perform a standard test. If there is a default it will appear as a classic default.

Example of a functioning stepper:





Stepper default:

In the event of a reoccurring default, check/change the defective parts.

Note: The fan test is meaningless if the bike is not equipped with a fan.

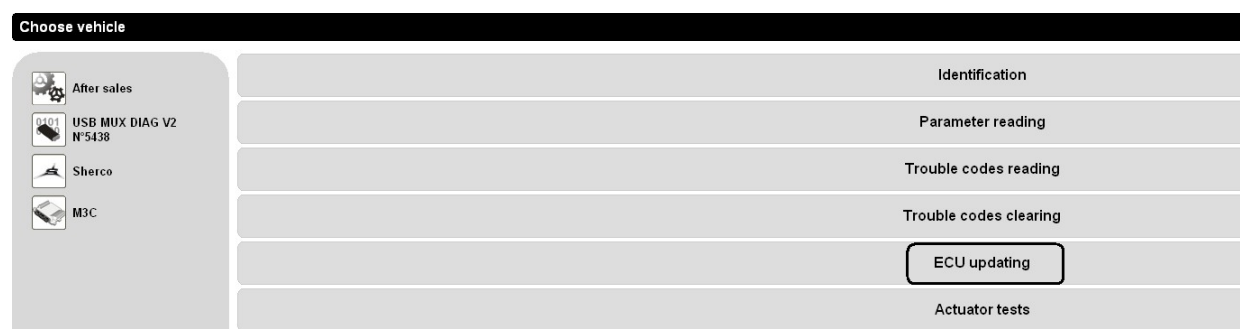
F- Updating the computer

By using the diagnostic tool, it is possible to make updates to the injection mapping (calibration). An example would be: installing a racing silencer or if there is an update from the factory. These files will be freely available on sherconetwork:

You must pay attention to the model, the displacement, the type of silencer, etc.

If in doubt, contact our technical support.

- 1- Download the desired update (file.mot)
- 2- Power up the motorcycle
- 3- Click on the computer update





Update ECU now ?

Confirm by clicking on this icon



Select the previously downloaded calibration file (.mot) and click open.

4- The file is downloading



Downloading ... (14.2%)

WARNING!

DO NOT TURN OFF THE MOTORCYCLE DURING THE DOWNLOAD OPERATION (FLASH)

**DO NOT ABRUPTLY STOP THE FLASH DOWNLOAD PROCESS
RISK OF IRREPARABLE DAMAGE TO THE CALCULATOR!**

5- At the end of the download the fuel pump will start and the following message will appear :

INFORMATION : Download was successful



Confirm by clicking on this icon

6- Check to make sure that the correct calibration file was allocated by clicking on « Identification »

Choose vehicle	
After sales USB MUX DIAG V2 N°5438 Sherco M3C	Identification Parameter reading Trouble codes reading Trouble codes clearing ECU updating Actuator tests

Check to make sure that the file name matches the file that was download

Lecture des paramètres en cours...

 Usine  USB MUX DIAG V2 N°5453  Sherco  M3C 	Numéro de série du véhicule (VIN)	BS630E3DB003296
	Compteur temps d'utilisation moteur	0.0 h
	N° de série du calculateur	2011980210
	Version logicielle	QR010010
	Version matérielle	S180037040Z9
Calibration	25EUS01.	

Note: Serial number information and operating hours are not reset to zero during a calibration update.

7- Start the motorcycle and make sure that the engine parameters are normal (idle, stepper opening, etc).

G- Screen printing function

If you are communicating with technical support and need help identifying potential problems you can perform a screen print operation by pressing F10 on your keyboard. This will allow you to attach these files to your inquiry.

The "identification" screen contains all of the important information about the motorcycle (serial number of the bike, number of hours of operation, calibration, etc).

Reading of current setting...		
 Factory  USB MUX DIAG V2 N°5438  Sherco  M3C 	VIN code	VNBS430E32B001921
	Overall engine operating hour counter	0.0 h
	ECU Board Serial Number	2011929783
	Software Version	QR010010
	Hardware Version	S180037040Z9
	Calibration	25EUS01.
	 	

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