PIAGGIO

SERVICE STATION MANUAL

1Q000958

MP3 530 hpe

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GENERAL STANDARDS NORM

General information

This section contains general information about using the manual and the vehicle as well as important safety instructions.

IMPORTANT WARNINGS AND NOTES

Each symbol has a precise meaning as shown below.

- NOTE: - This symbol indicates health risks to the operator or those nearby if the procedures described are not carried out properly become.
- ATTENTION:- This symbol indicates that the component being worked on is can be damaged if the described procedures are not carried out properly be guided.
- NOTE:- This paragraph contains additional instructions regarding the ongoing Procedures so that the operations can be carried out effectively.

REACH REGULATION WARNINGS:

To protect the health and safety of the PROFESSIONAL CUSTOMER, as intended through:

- Regulation (EC) No. 1907/2006 (REACh);
- Directive 2000/53/EC (END of LIFE VEHICLES);
- SCIP Database Directive (Article 9(1)(i)) of the Waste Framework Directive, amended modified by Directive 2018/851

The technical personnel working during ordinary and extraordinary maintenance are obliged to always wear the following personal protective equipment:

1. Chemical protection gloves unless the specific type is specifically stated is given, or if necessary, specific gloves based on the treatment to be treated fabric;
2. Mask, possibly of a chemically active type, if expressly requested;
3. Safety glasses.

The foregoing applies as an alternative to the provisions of the other regulations and those in the one laws applicable in individual countries. Regarding the use of other PPE provided by the Occupational safety is regulated, the current regulations on this subject apply.

GENERAL SAFETY INSTRUCTIONS:

1. Always wear safety glasses and appropriate clothing.
2. Always use a safety support when working under the vehicle.
3. Verify that the ignition key is always in the OFF position unless otherwise specified in the procedure
   ben.
4. Apply the handbrake (if equipped) before starting any work on the vehicle.
5. Run the engine only in well-ventilated areas to avoid exposure to carbon monoxide
   to avoid dangers.
6. When the engine is running, maintain a safe distance from moving parts, especially
   fans and belts.
7. To prevent serious burns, avoid contact with hot metal parts such as radiators
   Avoid exhaust manifold, exhaust pipe, catalytic converter and muffler.
8. Do not smoke during maintenance work.
9. To avoid possible injuries, remove rings, watches,
   Take off jewelry and loose clothing.
10. Keep your hands and other objects away from the radiator fan blades (if equipped).
    keep away!
11. The radiator fan (if equipped) is mounted on the radiator and can be installed due to an increase
    of the coolant temperature at any time. It is important to check that the engine is cool
    The fan has been disconnected from the wiring before starting work.

The units of measurement used in this manual are referred to as SI UNITS (In international system of units).Example: 24.5 ÷ 34.3 Nm

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CHECKS BEFORE DELIVERY	CON OFF

The ASR system is a driver assistance system, that the driver during acceleration maneuvers vern supported, especially on surfaces with ge less traction and under conditions that cause the rear wheel to suddenly slip can. The ASR takes effect under these circumstances automatically and reduces the power from the engine given performance within the confinement conditions predetermined limit, whereby it important for maintaining the stability of the vehicle contributes.

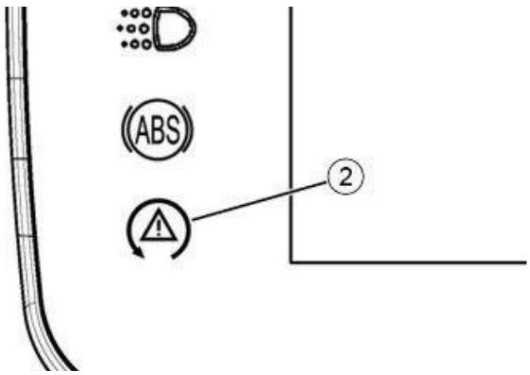
WARNING

THE ASR SYSTEM IS BASED ON DETECTION OF THE SPEED DIFFERENCE BETWEEN FRONT AND REAR WHEELS. SO THAT THE SYSTEM MAXIMUM EFFICIENCY UNDER ALL CONDITIONS MAINTAINING, IT IS NECESSARY CALIBRATION TO BE PERFORMED EVERY TIME YOU HAVE CHANGING ONE OF THE TIRES. TO CALIBRATE THE CONTROL UNIT THE BELOW PERFORM INDICATED PROCEDURES.

- BUTTON ASR «1»: activation / deactivation fouration.
- ASR WARNING LAMP «2»: Function onsanzeige.

Indicator light flashing mode:

- Switched off when the vehicle is moving: This System works, but is not active (normal Condition).
- Fast flashing when the vehicle is moving: This System works and is active (low grip and intervention to reduce engine power); special caution is recommended because the limit of liability has been exceeded; Bring the vehicle back to safety conditions by slowly releasing the throttle grip.



- Permanently switched on when the vehicle is moving: This System is deactivated and takes effect when adhesion is lost not a.

- If deactivation is intentional
  was taken (pressure of the corresponding
  button «1» for longer than 1 second
  de), we recommend the system like this
  to turn it back on as quickly as possible
  ten.
- If deactivation is NOT done
  is wanted, there is a malfunction in the ASR
  before: In this case the Diag
  nose and the reactivation of the
  system.

To ensure maximum safety of the vehicle
We definitely recommend this
to keep the system active. Deactivation could
only be necessary if you click on sub
foundations with extremely low traction
(mud, snow) starts on which the one
The ASR stopped the vehicle from moving
could prevent.

ANNOTATION

WHEN STARTING THE VEHICLE, THE ASR WARNING LIGHT FLASHES AT THE SAME FREQUENCY ABS WARNING LAMP, INDICATING A DIAG NOSE PHASE OF THE SYSTEM. IF NO ERRORS IF PRESENT, BOTH WARNING LIGHTS TURN ON AT THE SAME TIME OFF AS SOON AS YOU EXCEED 5 km/h.

WARNING

THE ASR SYSTEM IS ACTIVATED EVERY TIME THE IGNITION LOCK IS TURNED TO «ON». IF DEACTIVATED BY THE USER, THE ASR SYSTEM ONLY KEEP THE INACTIVE STATE WHEN THE VEHICLE IS TURNED ON WITH THE SWITCH TURNING OFF THE ENGINE; AT THE FOLLOWING ROTATION OF THE IGNITION LOCK, THE ASR SYSTEM AUTOMATICALLY ACTIVATES.

DANGER

IT IS NOTED THAT THE DRIVER'S ASSISTANCE SYSTEMS CANNOT CHANGE THE PHYSICAL LIMITS AND CANNOT PROVIDE CORRECT POWER MANAGEMENT

REPLACE TRACK AND IN THE CURVE. THE VEHICLE SHOULD ALWAYS BE USED TO THE EXTENT CAUTION AND COMPLY WITH THE LAWS BE USED.

DANGER

AT LOW SPEED, IE BELOW 5 km/h (3 mph), THE ASR SYSTEM IS NOT EFFECTIVE. BE PARTICULARLY CAREFUL WHEN ACCELERATING FROM A STOPPING WHEN GROUND IS LOW, PARTICULARLY FOR THE FIRST METERS.

ANNOTATION

IN CASE OF UNEVEN ROAD SURFACE, SHORT ACTIVATIONS OF THE ASR SYSTEM MAY OCCUR. THIS IS PART OF THE VEHICLE'S NORMAL OPERATIONAL CONDITION.

WARNING

THE ACTIVE ASR SYSTEM PREVENTS THE REAR WHEEL FROM REACHING HIGH ROTATION SPEEDS, WHEN THE VEHICLE IS BACKED ON THE MAIN STAND.

IT IS RECOMMENDED THAT YOU DO NOT CONTINUE USING THE THROTTLE IN THIS PARTICULAR CONDITION AS THIS WILL CAUSE ERROR SHUTDOWNS AND/OR DAMAGE CAN LEAD TO THE CATALYSTS.

DANGER

IN CASE OF A MALFUNCTION OF THE BATTERY, THE ABS - ASR SYSTEM WILL SWITCH OFF.

DANGER

POOR MAINTENANCE OF THE TIRES MAY CAUSE MALFUNCTIONS IN THE ASR SYSTEM. EVEN WITH REPEATED INTERVENTIONS OF THE ASR ROAD SURFACE WITH GOOD ADHESION OR IF WHEN YOU GIVE IT A LITTLE THROTTLE, THE WEAR AND/OR PRESSURE OF THE TIRES MUST BE CHECKED FIRST.

The status of the ASR system (activated/deactivated fourth) is also shown on the digital display when the Vehicle CONFIGURATION menu is selected (see section **“Digital display”).**

HOW THE ASR WARNING LAMP WORKS

STATUS ASR-SYSTEM	ASR WARNING LAMP WHEN OFF ENGINE OR KEY ON«ON»	ASR WARNING LAMP WITH THE ENGINE RUNNING AND DRIVING VEHICLE	ASR DURING DRIVING IN OPERATION (CONDITION LOWER GROUND GROUND)
ASR ACTIVE and calibrated	«ASR» symbol: flashes slowly at 1 Hz	«ASR» symbol: Off tet	«ASR» symbol: flashes quickly 5 Hz
ASR ACTIVE not calibrated		«ASR» symbol: lights up permanently	«ASR» symbol: flashes quickly 5 Hz
ASR intentionally deactivated	«ASR» symbol: lights up permanently	«ASR» symbol: lights up permanently	
ASR does not work (malfunction)	«ASR» symbol: lights up permanently	«ASR» symbol: lights up permanently	
ASR programming phase (successful)		«ASR» symbol: flashes slowly at 1 Hz; at the next start of the motor, symbol switched off if the programming is successful.	
ASR-Programmierphase (not successful)		«ASR» symbol: lights up permanently the next time you start the Motors if the programming was not successful.	

CALIBRATION PROCEDURE ASR SYSTEM

Calibrate the ASR system before driving the vehicle is delivered to the customer. **It is advisable, the procedure also after the replacement one or more tires.**

• Wait until the diagnostic phase of the systems ASR and ABS is completed;

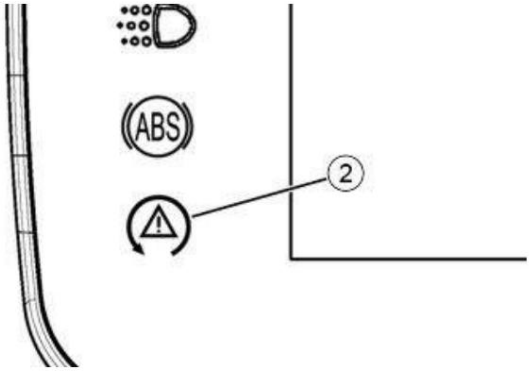
• **Start the engine and drive in a short straight line Distance** on a flat road at **more than 5 km/h (3.1 mph)** and the blinker goes out

Wait for the ABS warning light to turn off. If the Tires need to be changed, wait until The ASR warning light also stops flashing.

• **Stop** and let the engine idle at least Run **for 5 seconds ;**

• Press the ASR «1» button and select one of the Brake lever pulled for at least 7 seconds hold on.

• **Activating** the process for learning
the wheel diameter or for ASR calibration
is indicated by the ASR control lighting up
Lamp «2» confirms with slow flashes
tight.
• **At a constant speed of**
30÷40 km/h (18.6÷24.8 mph) accelerate and
hold this **for at least 8 seconds .** The Bei
maintaining vehicle speed in the correct range to
complete the procedure
is indicated by faster flashing of the ASR con
Troll lamp **«2»** confirmed.



• **The end of the process** is marked by the **sale**
The ASR indicator lamp «2» is displayed
and the **ASR system is now functional.**
• **To save** the process, **the engine**
by turning the ignition key to the **position**
Switch off "OFF" and wait at least 60 seconds
before turning **it** to **«ON»** again
Wait until a gear is engaged.

• **Complete the process within 5 minutes** when the **ASR indicator light «2» lights up steadily remains,** it means that the **procedure failed.**

Therefore, the calibration process of the ASR must be repeated until a positive result is obtained.

Regarding the ASR indicator light after detection:

- Procedure OK: ASR indicator light OFF and system active. If the ignition switch is...
  next time it is set to "ON", the new wheel diameter will be saved.
- Procedure failed: ASR INDICATOR LAMP SOLID ON and system active
  (for safety) with previously recorded wheel diameter value or standard value (if never
  previously recorded).

ANNOTATION

HOWEVER, THE SYSTEM IS ABLE TO PERFORM AN AUTOMATIC CALIBRATION AFTER A TIRE CHANGE.

Aesthetic control

Aesthetic control:

- Lack
- Fitting the plastic parts together
- scratches

- Dirt

Check torques

Control of torques

- Safety torques

- Fastening screws

Safety torques:

- Rear shock absorber top mount
- Lower mounting rear shock absorbers
- Front shock absorber top mount
- Lower mounting front shock absorbers
- Fastening slide rods
- Fastening brake calipers
- Fastening screws front wheels
- Front wheel axle nuts
- Rear wheel axle nut
- Fasteners swingarm frame - engine
- Handlebar fastening nut
- Lower threaded ring on side steering tubes
- Upper threaded ring on side steering tubes
- Lower threaded ring middle steering tube
- Upper threaded ring middle steering tube
- Constant velocity joints

Electrical system

- Battery
- Main switch
- Headlights: high beam, low beam, parking lights (front and rear) and the corresponding controls to shine
- Headlight adjustment in accordance with applicable laws
- Brake light switch on front and rear brakes and corresponding brake light lamp
- Turn signals and indicator control
- Instrument lighting
- Instruments: Fuel level gauge and water temperature gauge
- Indicator lights on the instrument unit
- Horn
- Electric starting

• Switch off the engine using the emergency stop switch

• Electric opening of the seat with remote control

• Lock - Unlock Button Roll Lock System **TO OBTAIN**

BEST PERFORMANCE, THE BATTERY MUST BE FULLY CHARGED BEFORE USE. INADEQUATE BATTERY CHARGE PRIOR TO FIRST SET AND LOW BATTERY FLUID LEVEL WILL RESULT IN PREMATURE BATTERY AGING.

DANGER

WHEN INSTALLING THE BATTERY, ATTACH THE PLUS CABLE FIRST AND THEN THE NEGATIVE CABLE.

WARNING

THE BATTERY ELECTROLYTE IS TOXIC AND CAN CAUSE SERIOUS BURNS. IT CONTAINS SULFURACIC ACID.
CONTACT WITH EYES, SKIN AND CLOTHING
ABSOLUTELY AVOID.
IF IN EYES OR SKIN, RINSE WITH PLENTY OF WATER FOR 15 MINUTES AND THEN IMMEDIATELY SEEK A DOCTOR.
IF TAKING THE LIQUID, IMMEDIATELY DRINK LARGE AMOUNTS OF WATER OR VEGETABLE OIL. NOTIFY A DOCTOR IMMEDIATELY.
BATTERIES GENERATE EXPLOSIVE GASES; KEEP AWAY FROM OPEN FLAMES, SPARKS AND LIT CIGARETTES. WHEN CHARGING BATTERIES IN CLOSED ROOMS, THE ROOMS MUST BE WELL VENTILATED. ALWAYS WEAR SAFETY GLASSES WHEN WORKING NEAR BATTERIES.

KEEP AWAY FROM CHILDREN.

DANGER

NEVER USE FUSES OF GREATER CAPACITY THAN THE STATED CAPACITY. USE OF AN INCORRECT PERFORMANCE FUSE CAN CAUSE DAMAGE TO THE VEHICLE AND IS A FIRE HAZARD.

Level controls

Level controls:

- Brake fluid level

- Fluid level Roll-Lock system - Oil level rear

wheel transmission

- Engine coolant level

- Engine oil level

Test drive

Test drive:

- Cold start

- Function of the instruments

- Reaction to accelerating

- Stability during acceleration and braking

- Front and rear brake function

- Efficiency parking brake

- Front and rear shock absorber function

- Excessive noise
- Efficiency locking and unlocking system Roll Lock

Static control

Static check after the test drive:

• Start with a warm engine

• Idle stability (when turning the handlebars) •

Smooth rotation of the steering

• Possible leakage of liquids

• Function of the cooling fan

DANGER

TIRE PRESSURE MUST BE CHECKED AND ADJUSTED WHEN TIRES ARE COLD.

DANGER

DO NOT EXCEED THE SPECIFIED TIRE PRESSURE AS THE TIRE MAY BURST.

Functional control

Functional check:

• Hydraulic brake system: lever travel

• Clutch: Check correct functioning

• Motor: General functional check and no excessive noise

• Other: Check vehicle documents, check frame number and engine number, on-board tools,

Attaching the license plate, checking locking devices, checking tire pressure, installing

Rearview mirrors and any accessories

Special work for the vehicle

TOOLS SUPPLIED

The on-board tool kit consists of:

- Key for adjusting the shock absorbers

tension;

- Fuses removal tool.

The on-board tools are located in the helmet compartment.

LICENSE PLATE HOLDER

DANGER

ANNOTATION

ONLY THE LICENSE PLATE HOLDER IN THE THE VEHICLE IS SUPPLIED WITH ASSEMBLY AS YOU EQUIPPED WITH THE APPROVED MANDATORY REAR SPOTLIGHTS.

Change unit of measurement

When the **SETTINGS** function is called

by briefly pressing the **“UP”** or buttons

Scroll through **“DOWN”** and open the **“CONFIG**

RATION" by briefly pressing the **"SET"** button

call.

By briefly pressing the **“UP”** or buttons

"DOWN" select the parameter:

- Speed: The desired one

  Select unit of measurement: Km/h, mph

  mpg ENG / mph mpg USA / ON, OFF.
- Temperature: The desired measurement

  select degree: degrees C°, F° / ON,

  OFF.

Select the desired parameter by briefly pressing

press the **"SET"** button .

Setting the clock

When the **SETTINGS** function is called

by briefly pressing the **“UP”** or buttons

Scroll through **“DOWN”** and open the **“CONFIG**

RATION" by briefly pressing the **"SET"** button

call.

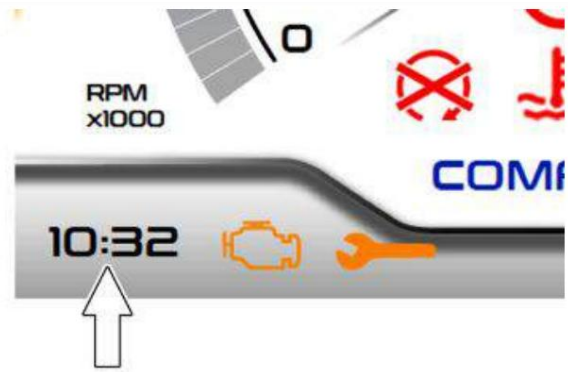
By briefly pressing the **“UP”** or buttons

"DOWN" select the desired parameter

only:

- Clock setting (hours, minutes,

  Leave)
- 12h
- 24 hours



- Leave

Select the desired parameter by briefly pressing

press the **"SET"** button .

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TECHNICAL DATA	DT

This section describes general features of the vehicle.

Regulations

This section contains the general regulations for safety and maintenance work on the vehicle
stuff played back.

Safety regulations

- Ensure there is adequate ventilation in the workshop when working on the vehicle while it is running
Engine must be carried out. The rooms must be well ventilated. If necessary, have to
Appropriate extraction systems must be used. Never run the engine indoors
sen. The exhaust fumes are toxic.
- The electrolyte contains sulfuric acid. Eyes, clothing and skin must be protected. Schwe
Felic acid is highly corrosive. In case of contact with eyes or skin, rinse immediately with plenty of water
see a doctor immediately.
- The battery produces hydrogen. Hydrogen gas can be highly explosive. Especially during
When charging the battery, do not smoke near the battery, keep away from naked flames and have fun
avoid formation of marks.
- Gasoline is extremely flammable and can be explosive under certain conditions. In Ar
Smoking is not allowed in the working area, keep open flames away and avoid the formation of sparks.
- The brake pads must be cleaned in well-ventilated rooms. The compressed air jet must
be directed so that the dust created by the abrasive material is not inhaled. The
Brake pads do not contain asbestos, but inhaling the dust is still harmful.

Maintenance instructions

- Only original PIAGGIO spare parts and the lubricants recommended by the manufacturer
turn around. Non-original or unsuitable spare parts can damage the vehicle.
- Only use special tools designed for this vehicle.
- When reinstalling, always use new gaskets, sealing rings and split pins.
- After removing the individual components, they must be covered with a non-flammable or flame-retardant material
Cleaned with solvents. All work surfaces, with the exception of conical connections,
Lubricate before reassembly.
- After reassembly, check whether all components are installed correctly and function properly
kidneys.
- Use only metric tools for removal, overhaul and reassembly. The
Screws, nuts and bolts of the metric system are not the same as those of the English inch system
tems interchangeable. The use of unsuitable tools or parts can cause damage to the
Drive vehicle.

- When working on the electrical system, pay particular attention to the correct cable connections

Pay attention when connecting ground and battery.

Chassis and engine number

The frame and engine numbers consist of

a prefix and a number, each on

are stamped on the frame or the engine.

These numbers must be included when ordering from Er

parts of the sentence must always be specified. Check

Check whether the frame number on the vehicle matches the

Number in the vehicle documents matches

true.

DANGER

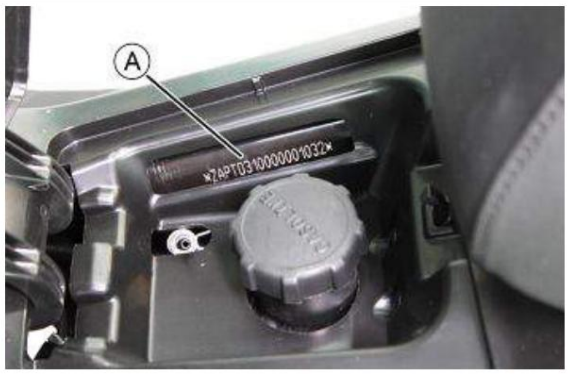
A CHANGE OF THE FRAME NUMBER IS A PUNISHMENT AND MAY, AMONG OTHERS, RESULT IN CONFUSION OF THE DRIVING A VEHICLE.

Frame number

To read the frame number **«A» ,** open it

the access flap to the tank cap and the

Lift the fuel drip pan flap.

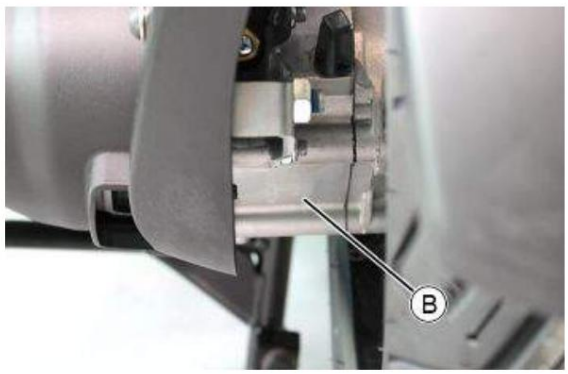


Engine number

The engine number **«B»** is near the bottom

Rear left shock absorber bracket

punched.



CHASSIS AND ENGINE NUMBER

Technical information	Description/Value
Frame prefix	ZAPTD3100
Engine prefix	**TD31M**

Vehicle data

VEHICLE DATA

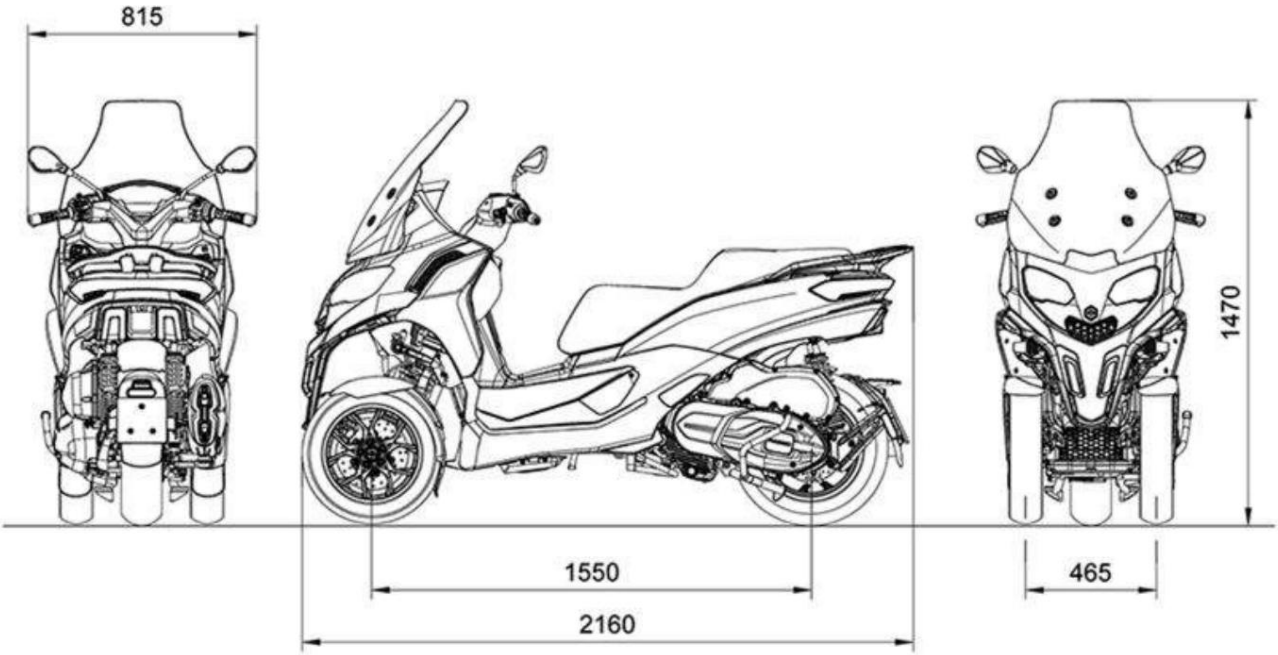
Technical information	Description/Value
Frame	Made of steel pipes and pressed steel sheet
Front suspension	Roll system with parallelogram suspension, with two die-cast aluminum arms, two side tubes and shock absorbers with hydraulic locking system
Rear suspension	Two gas shock absorbers with preload control.
Front brake	Double hydraulic disc brake Ø 258 mm with brake lever on the right of the handlebar; ABS with brake assist.
Rear brake	Hydraulic disc brake Ø 240 with brake lever on the left handlebars; ABS with brake assist.
Combination brake system	Works on 3 discs at the same time, hydraulically via the pedal operated on the running board; ABS with brake assist.
Wheel rim gene type	Made of light metal.
Front rims	13" x 3,00
Rear wheel rim	14" x 4,50
Front tires	Tubeless 110/70 - 13" 48S
rear tire	Tubeless 140/70 - 14" 68S
Tire pressure front tires	2 bar
Rear tire pressure (with passenger)	2,4 (2,6) bar
Vehicle mass ready to drive	280 Kg
Technically permissible maximum mass at full load	460 Kg
Battery	12V-12Ah

Engine data

ENGINE DATA

Technical information	Description/Value
Type	Single cylinder 4-stroke engine
displacement	530 cm³
Bore x stroke	97,5 x 71 mm
Compression ratio	11,5 ± 0,5 : 1
Engine idle speed	1,600 ± 100 U/Min
Valve control	Four valve, single, chain controlled overhead camshaft.
Valve clearance (cold)	Suction: 0.15mm Outlet: 0.15mm
Maximum Performance	32,5 kW bei 7.250 U/min
maximum torque	50,0 Nm bei 5.250 U/min
drive	Continuously variable automatic transmission with expansion discs and Torque support, V-belt, automatic self-ventilating dry centrifugal clutch, drive compartment with cooling fan. Reverse gear with electric actuation.
Rear wheel transmission	With gears in oil bath.
lubrication	Engine lubrication with chain-controlled cam pump (in the housing) and double mesh and paper filter.
cooling	With pressure circulation of liquid.
Motorstart	Electric
ignition	Inductive electronic high-performance ignition integrated with the injection, variable ignition timing advance, separate ignition coil and double spark plug.
Pre-ignition	With three-dimensional map controlled by the control unit
spark plug	NGK MR7BI-8 / MR8BI-8
Electrode gap	0,7 ÷ 0,9 mm
care	Electronic injection with electric fuel pump.
care	Bleifreies Benzin max. E10 (ROZ 95)
Exhaust	Absorption exhaust with catalytic converter and lambda sensor.
Emissions standard	EURO 5

Dimensions and weight



Filling quantities

FILLING QUANTITIES

Technical information	Description/Value
Engine oil	1,7 Liter
Gear oil	250 cm³
coolant	~ 1,8 l
Petrol tank	13,7 ± 0,5 l

Torque guidelines

FRONT BRAKE

Name	Torque guidelines in Nm
Connection of the brake caliper line to the side steering tube	25 ÷ 28 Nm (18 ÷ 21 lb*ft)
Connection of the brake line to the brake caliper	20 ÷ 25 Nm (15 ÷ 18 lb*ft)
Connection line - brake pump	20 ÷ 25 Nm
Brake caliper connecting screw	22 ÷ 27 Nm (16 ÷ 20 lb*ft)
Fastening screw brake caliper to bracket	20 ÷ 25 Nm (15 ÷ 18 lb*ft)
Brake fluid bleeder screw	8 ÷ 12 Nm (5.9 ÷ 9 lb*ft)
Front brake disc screws	8 ÷ 10 Nm (5.9 ÷ 7 lb*ft)

REAR BRAKE

Name	Torque guidelines in Nm
Adjusting nut for parking brake cable	10 Nm
Brake line connection on the rear brake caliper	20 ÷ 25 Nm (15 ÷ 18 lb*ft)
Connection line - brake pump	20 ÷ 25 Nm

Name	Torque guidelines in Nm
Connection pipe-hose screws	13 ÷ 18 Nm (10 ÷ 13 lb*ft)
brake disc rear wheel brake (°)	5 ÷ 6,5 Nm (3.7 ÷ 4.8 lb*ft)
Fastening screws for the rear brake caliper	41,5 ÷ 51,5 Nm (31 ÷ 38 lb*ft)
Fastening screws for the retaining bracket Lines	6 ÷ 8 Nm
Fastening screws for the rear brake caliper cable Parking	6 ÷ 10 Nm
brake - Fastening screw for the brake caliper on the bracket (°)	24 ÷ 27 Nm (18 ÷ 20 lb*ft)

(°) Apply LOCTITE screw locking medium strength type 243.

PEDAL-COMBI BRAKES

Name	Torque guidelines in Nm
Connection line - brake pump	20 ÷ 25 Nm
Fastening screw brake pedal to the frame	20 ÷ 25 Nm
Fastening screw brake fluid reservoir combination brake with	1 ÷ 1,7 Nm

ABS SYSTEM

Name	Torque guidelines in Nm
Connections cables - ABS control unit	19 ÷ 21 Nm
Connections lines - ABS distributor	20 ÷ 25 Nm
Fastening screws ABS control unit to bracket	6 ÷ 10 Nm
Fastening screws holding plates rigid cables ABS	4 ÷ 6 Nm
Fixing screw for ABS control unit holder	6 ÷ 10 Nm
ABS sensor tensioning screws	6 ÷ 10 Nm (4.4 ÷ 7 lb*ft)

FRONT SUSPENSION

Name	Torque guidelines in Nm
Fastening nuts constant velocity joints	18 ÷ 20 Nm (13 ÷ 15 lb*ft)
Bolzenmutter Lenkarm	20 ÷ 25 Nm (15 ÷ 18 lb*ft)
Lower shock absorber mount	19 ÷ 26 Nm (14 ÷ 19 lb*ft)
Upper shock mount	19 ÷ 29 Nm (14 ÷ 21 lb*ft)
Attachment sliding shaft suspension locking system	6,5 ÷ 10,5 Nm (4.8 ÷ 8 lb*ft)
Attachment of electric motor to roll lock device	11 ÷ 13 Nm (8 ÷ 10 lb*ft)
Fastening the pump bolt to the roll-lock device	11 ÷ 13 Nm (8 ÷ 10 lb*ft)
Attachment of pump to roll-lock device	11 ÷ 13 Nm (8 ÷ 10 lb*ft)
Fastening potentiometer to roll lock device	8 ÷ 10 Nm (5.9 ÷ 7 lb*ft)
Fastening the sensor to the Roll-Lock saddle	2,5 ÷ 2,9 Nm (1.8 ÷ 2.1 lb*ft)
Lower threaded ring of the side steering tube	12 ÷ 15 Nm (9 ÷ 11 lb*ft)
Upper threaded ring of the side steering tube	20 ÷ 24 Nm (15 ÷ 18 lb*ft)
Pressure regulator on brake distributor	18 ÷ 20 Nm (13 ÷ 15 lb*ft)
Connection to pump for roll lock device	20 ÷ 25 Nm (15 ÷ 18 lb*ft)
Connection line brake caliper Roll Lock system on the side steering tube	25 ÷ 28 Nm (18 ÷ 21 lb*ft)
Pipe end pieces on brackets for steering bearings	7 ÷ 11 Nm (5.2 ÷ 8 lb*ft)
Cable control saddle roll lock	10 Nm
Fastening screw sliding shaft on the shock absorber	45 ÷ 50 Nm (33 ÷ 37 lb*ft)
Connecting screws arms	45 ÷ 50 Nm (33 ÷ 37 lb*ft)
Mounting screws arms on side steering tubes	45 ÷ 50 Nm (33 ÷ 37 lb*ft)
Mounting screws arms on the middle steering tube	45 ÷ 50 Nm (33 ÷ 37 lb*ft)
Fastening screws connecting flange wishbone	20 ÷ 25 Nm (15 ÷ 18 lb*ft)
Mounting screws brake caliper suspension locking system	20 ÷ 25 Nm (15 ÷ 18 lb*ft)
Front wheel fastening screws	19 ÷ 24 Nm (14 ÷ 18 lb*ft)
Fastening screws brake disc segment for the suspension locking system	20 ÷ 25 Nm (15 ÷ 18 lb*ft)

REAR SUSPENSION

Name	Torque guidelines in Nm
Upper shock mount	33 ÷ 41 Nm (24 ÷ 30 lb*ft)
Lower shock absorber mount	33 ÷ 41 Nm (24 ÷ 30 lb*ft)
Shock absorber retaining bracket - housing	20 ÷ 27 Nm (15 ÷ 18 lb*ft)
Rear wheel axle	104 ÷ 126 Nm (77 ÷ 93 lb*ft)
Exhaust mounting arm mounting screw	27 ÷ 30 Nm (20 ÷ 22 lb*ft)

STEERING

Name	Torque guidelines in Nm
Lower steering tube threaded ring (middle steering tube)	10 ÷ 12 Nm (7 ÷ 9 lb*ft)
Upper steering tube threaded ring (middle steering tube)	32,5 ÷ 40 Nm (24 ÷ 30 lb*ft)
Handlebar mounting screw	50 ÷ 55 Nm (37 ÷ 41 lb*ft)
Fixing screws U-bolt handlebar gear unit	7 ÷ 10 Nm (5.2 ÷ 7 lb*ft)

FRAME

Name	Torque guidelines in Nm
Swingarm adjustment bushing	5 ÷ 7 Nm (3.7 ÷ 5.2 lb*ft)
Fastening bolts engine arm - frame arm	32,5 ÷ 40 Nm (24 ÷ 30 lb*ft)
Swingarm adjustment bushing nut	54 ÷ 60 Nm (40 ÷ 44 lb*ft)
Bolt swingarm - engine	98 ÷ 118 Nm (72 ÷ 87 lb*ft)
Bolt frame - swingarm	54 ÷ 60 Nm (40 ÷ 44 lb*ft)
Main stand fixing bolts	31 ÷ 39 Nm (23 ÷ 29 lb*ft)

EXHAUST

Name	Torque guidelines in Nm
Exhaust heat protection mounting screw	4 ÷ 5
Exhaust mounting screw on bracket	27 ÷ 30
Tightening the lambda sensor on the exhaust manifold	20 ÷ 30
Tightening the exhaust manifold-exhaust connector	12 ÷ 14
Fastening clamp for exhaust manifold - exhaust silencer	15,5 ÷ 18,5

LUBRICATION

Name	Torque guidelines in Nm
Oil pump cover screws	0,7 ÷ 0,9 Nm (0.52 ÷ 0.66 lb*ft)
Oil pump fastening screws to the housing	5 ÷ 6 Nm (3.7 ÷ 4.4 lb*ft)

CYLINDER KIT AND VALVE TIMING

Name	Torque guidelines in Nm
spark plug	11,0 ± 1,0
Screws cylinder head - cylinder	11,0 ± 1,0
Fastening nuts cylinder head - cylinder	13 Nm + 90° + 90°
Mounting nuts cylinder head exhaust/intake	10 ÷ 12 Nm (7 ÷ 9 lb*ft)
Cylinder head lubrication control nozzle	5 ÷ 7 Nm (3.7 ÷ 5.2 lb*ft)
Coolant temperature sensor - cylinder head	22,0 ± 1,0
Injector mounting screw	3 ÷ 4 Nm (2.2 ÷ 3 lb*ft)
Decompression device screw	7 ÷ 8,5 Nm (5.2 ÷ 6.3 lb*ft)
Fastening screw chain tensioner pad	10 ÷ 14 Nm (7 ÷ 10 lb*ft)
Pick-up housing	3 ÷ 4 Nm (2.2 ÷ 3 lb*ft)
Screws intake manifold	11 ÷ 13 Nm (8 ÷ 10 lb*ft)
Valve cover fastening screws	7 ÷ 9 Nm (5.2 ÷ 6.6 lb*ft)
Throttle body fastening screws	11 ÷ 13 Nm (8 ÷ 10 lb*ft)
Cylinder head mounting screws	10 ÷ 12 Nm (7 ÷ 9 lb*ft)
Fastening screws for camshaft bracket	4 ÷ 6 Nm (3 ÷ 4.4 lb*ft)
Chain tensioner screw	4,5 ± 0,5 Nm
Fastening screws clamping device	11 ÷ 13 Nm (8 ÷ 10 lb*ft)

DRIVE COVER

Name	Torque guidelines in Nm
Nut guided pulley	92 ÷ 100 Nm (68 ÷ 74 lb*ft)
Drive pulley nut	160 ÷ 175 Nm (118 ÷ 129 lb*ft)
Fasteners M8 drive cover	23 ÷ 26 Nm (17 ÷ 19 lb*ft)
Fasteners M6 drive cover	11 ÷ 13 Nm (8 ÷ 10 lb*ft)
Threaded ring coupling	65 ÷ 75 Nm (48 ÷ 55 lb*ft)
Screws air baffle	7,0 ± 1,0 Nm
Screws water pump cover	3 ÷ 4 Nm (2.2 ÷ 3 lb*ft)
Noise protection cover - drive cover	7,0 ± 1,0 Nm
Alternator cover screws	11 ÷ 13 Nm (8 ÷ 10 lb*ft)

FLYWHEEL COVER

Name	Torque guidelines in Nm
Chain tensioner support complete chain guide - housing	3,5 ± 0,5 Nm
Flywheel mounting nut	115 ÷ 125 Nm (85 ÷ 92 lb*ft)
Fasteners stator	8 ÷ 10 Nm (5.9 ÷ 7 lb*ft)
Fastening screws for the blow-by line	3 ÷ 4 Nm (2.2 ÷ 3 lb*ft)
Fastening screws for freewheel to alternator	13 ÷ 15 Nm (10 ÷ 11 lb*ft)
Stator wiring fixing screws	3 ÷ 4 Nm (2.2 ÷ 3 lb*ft)
Screws holder protective wall	6,0 ± 1,0 Nm
Minimum oil pressure sensor	12 ÷ 14 Nm (9 ÷ 10 lb*ft)
Impeller water pump	5,0 ± 1,0 Nm

ENGINE CASE AND CRANKSHAFT

Name	Torque guidelines in Nm
Countershaft fastening nut	25 ÷ 29 Nm (18 ÷ 21 lb*ft)
Engine oil	12 ÷ 16 Nm (9 ÷ 12 lb*ft)
filter oil drain plug engine oil	24 ÷ 30 Nm (18 ÷ 22 lb*ft)
Motor housing connecting screws	11 ÷ 13 Nm (8 ÷ 10 lb*ft)
Oil pump screws	5 ÷ 6 Nm (3.7 ÷ 4.4 lb*ft)
Fastening screws gear to crankshaft	12,0 ± 1,0 Nm
Screws partition oil pump room	3,5 ± 0,5 Nm

COOLING

Name	Torque guidelines in Nm
Impeller water pump	5,0 ± 1,0 Nm
Screws water pump cover	3 ÷ 4 Nm (2.2 ÷ 3 lb*ft)
Bleed screw	3,5 ± 0,5 Nm

THROTTLE CABLES

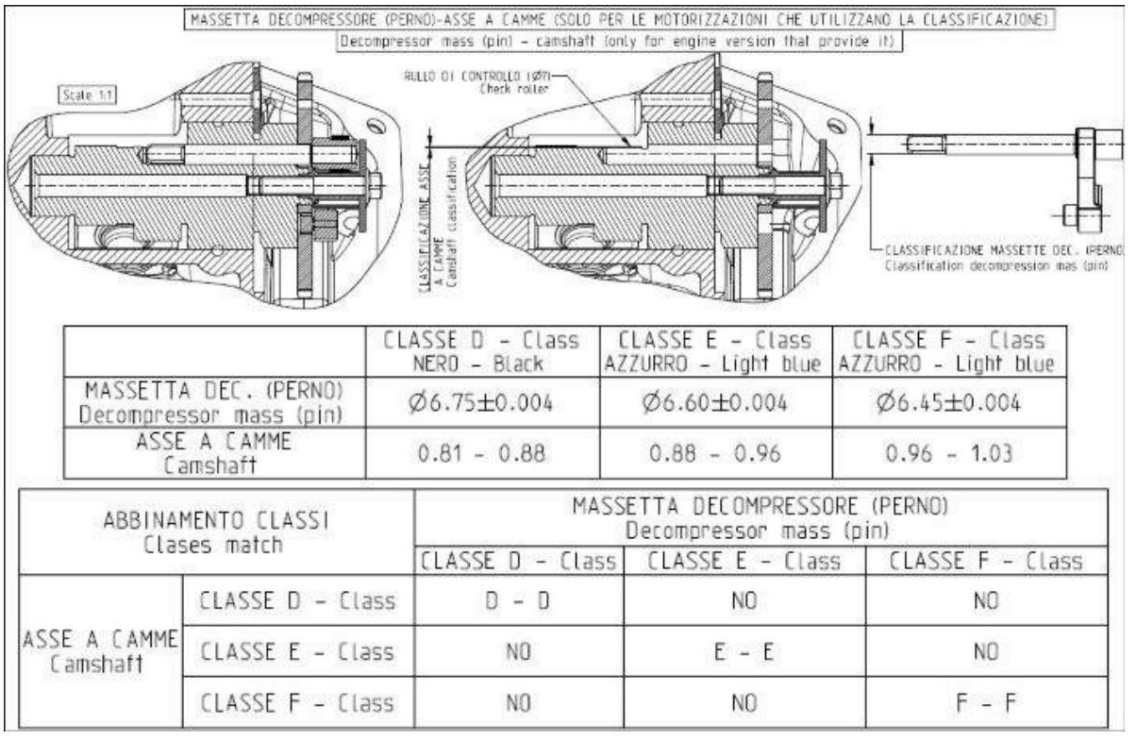
Name	Torque guidelines in Nm
Adjusting nuts cables	5 ÷ 6 Nm
Fastening screw cover on the throttle body	6 ÷ 10 Nm

REVERSE GEAR SYSTEM

Name	Torque guidelines in Nm
Reverse gear control bushing ring nut. Reverse gear	66 ÷ 74 Nm (49 ÷ 55 lb*ft)
system oil filler plug	15 ÷ 17 Nm (11 ÷ 13 lb*ft)
Reverse gear cover screws	11 ÷ 13 Nm (8 ÷ 10 lb*ft)
Reverse gear motor mounting screws	11 ÷ 13 Nm (8 ÷ 10 lb*ft)

Revision dates

CLASSIFICATION BOLT/DECOMPRESSION MASS - CAMSHAFT



	CLASSE D - Class NERO - Black	CLASSE E - Class AZZURRO - Light blue	CLASSE F - Class AZZURRO - Light blue
MASSETTA DEC. (PERNO) Decompressor mass (pin)	Ø6.75±0.004	Ø6.60±0.004	Ø6.45±0.004
ASSE A CAMME Camshaft	0.81 - 0.88	0.88 - 0.96	0.96 - 1.03

ABBINAMENTO CLASSI Clases match		MASSETTA DECOMPRESSORE (PERNO) Decompressor mass (pin)		
		CLASSE D - Class	CLASSE E - Class	CLASSE F - Class
ASSE A CAMME Camshaft	CLASSE D - Class	D - D	NO	NO
	CLASSE E - Class	NO	E - E	NO
	CLASSE F - Class	NO	NO	F - F

CLASSIFICATION DECOMPRESSION MASS (BOLT) - CAMSHAFT

	Class D (black) Ø	Class E (light blue)	Class F (light blue)
Decompression mass (bolts)	6.75 ± 0.004	Ø 6.60 ± 0.004	Ø 6,45 ± 0,004
camshaft	0,81 - 0,88	0,88 - 0,96	0,96 - 1,03

COMBINATION CLASSES

	Decompression mass (Bolt) - Class D	Decompression mass (Bolt) - Class E	Decompression mass (Bolt) - Class F
Cam Axle - Class D	D - D	NO	NO
Cam Axle - Class E	NO	AND AND	NO
Cam Axle - Class F	NO	NO	F - F

Bolt/decompression compound

- Class identification: D - E - F

- Stamping of the class identifier: bolt their

camshaft

- Class identification: D - E - F

- Stamping of the class identifier: camshaft view of the valve control gear ring

ANNOTATION

THE CLASSES OF TWO COMPONENTS MUST BE IDENTICAL.

Check the pressure value in the combustion chamber in the starter motor to ensure that it is within the following listed acceptance limits, as well as the determination of the engine drive speeds.

The test must be carried out with a charged battery and ambient temperature

Use a pressure gauge to measure the (relative) pressure value on the drive and the corresponding motor speeds.

PRESSURE TEST COMBUSTION CHAMBER IN THE STARTING DRIVE

	Engine speed drive (rpm) 415	**Relative pressure (bar)**
MIN		5,2
MAX	550	7,2

Built-in games

cylinder head

Operating limits of the valves

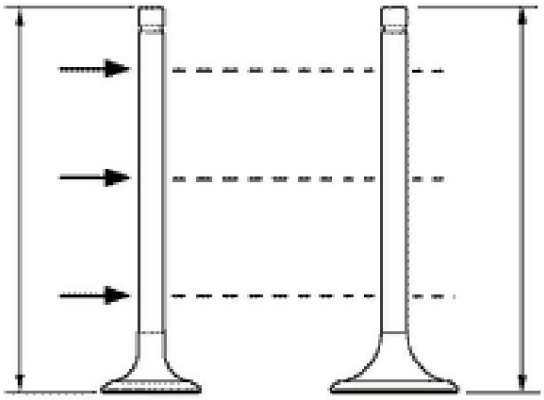
- Measure the diameter of the valve stem at the three locations shown in the figure.

STANDARD DIAMETER

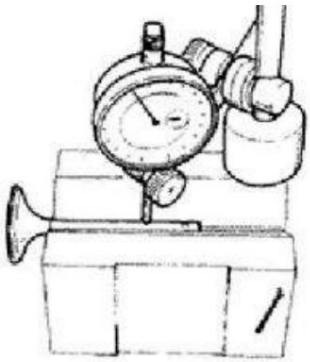
Technical information	**Description/Value**
Suction:	4,987 ÷ 4,972 mm
Outlet:	4,975 ÷ 4,960 mm

SMALLEST ALLOWABLE DIAMETER

Technical information	**Description/Value**
Suction:	4,96 mm
Outlet:	4,945 mm



- Measure the bend of the valve stem. Plus that
Place the valve on a V-shaped holder and the
Measure the bend with a dial indicator.

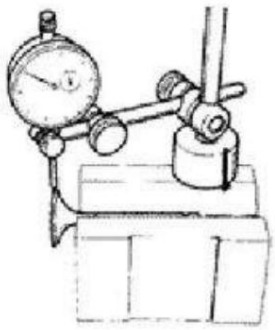


Technical specifications

Permissible limit:

0,1 mm

- The rounding of the valve head with a dial indicator
measure. To do this, the dial indicator must be at right angles
be attached to the valve head. The valve
is rotated on a V-shaped holder.



Technical specifications

Permissible limit:

0,03 mm

Guide clearance - valve clearance

- After measuring the diameter of the valve guide and the diameter of the valve stem, the
Calculate the fitting clearance between the valve guide and the stem.

SUCTION

Technical information	Description/Value
Standard installation clearance:	0,013 ÷ 0,04 mm
Permissible limit:	0,08 mm

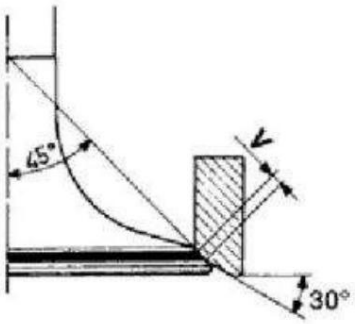
OUTLET

Technical information	Description/Value
Standard installation clearance:	0,025 ÷ 0,052 mm
Permissible limit:	0,09 mm

STANDARD LENGTH OF VALVE

Technical information	Description/Value
Suction:	95,0 ± 0,3 mm
Outlet:	94,2 ± 0,3 mm

Seat - valve mating surface



Technical specifications

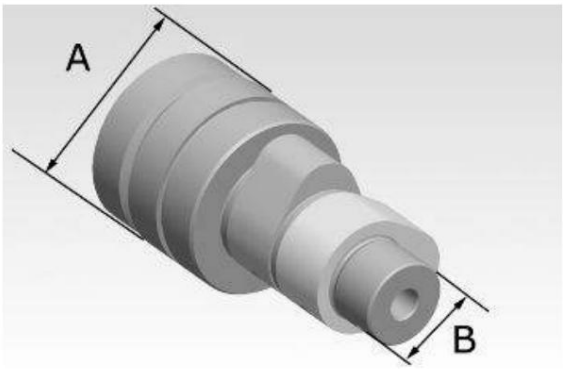
Default value:

1 ÷ 1,3 mm

Permissible limit:

1,6 mm

Camshaft treads



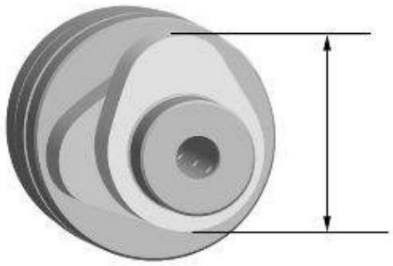
STANDARD DIAMETER

Technical information	Description/Value
Tread A Ø:	42 - 0,060 -0,085 mm
Tread B Ø:	20 - 0,020 -0,041 mm

SMALLEST ALLOWABLE DIAMETER

Technical information	Description/Value
Tread A Ø:	41,910 mm
Tread B Ø:	19,940 mm

Height cam



STANDARD HEIGHT

Technical information	Description/Value
Suction	31,982 mm
outlet	31,297 mm

ALLOWABLE LIMIT

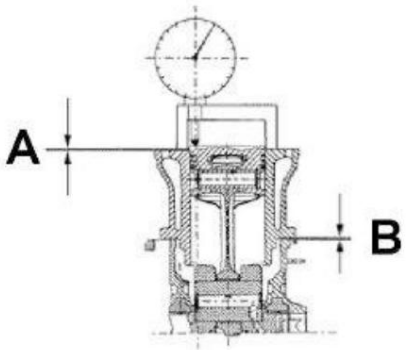
Technical information	Description/Value
Suction	31,747 mm
outlet	31,064 mm
Standard-Axialspiel:	0 ÷ 0,22 mm
Largest permissible axial play:	0,3 mm

System for calculating seal strength

System for calculating the seal thickness

Includes the compression ratio.

THE VALUE "A" TO BE DETERMINED IS THE MEASURE FOR THE EXCESS OR PISTON BOTTOM RESIDUE ACROSS THE TOP CYLINDER SURFACE.
THE VALUE «A» IS NEEDED TO DETERMINE THE THICKNESS «B» OF THE CYLINDER BASE GASKET (FOR BALANCE THE COMPRESSION RATIO). EVER NEXT THE PISTON BOTTOM OUT OF THE CYLINDER THE MORE STRONGER THE CYLINDER BASE GASKET «B» TO BE FITTED MUST BE. THE FURTHER THE PISTON INTO THE CYLINDER, THE REVERSE THE THINNER THE CYLINDER BASE GASKET TO BE FITTED MUST BE.



Technical specifications

Compression ratio

11,5 ± 0,5 :1

CYLINDER BASE GASKET THICKNESS

Name	Ma_A	Strength
MEASURED VALUE «A»	- 0,185 ÷ - 0,10	0,4
MEASURED VALUE «A»	- 0,10 ÷ + 0,10	0,6
MEASURED VALUE «A»	+ 0,10 ÷ + 0,185	0,8

ANNOTATION

THE VALUES INDICATED WITH «-» CORRESPOND TO THE RESIDUE OF THE PISTON BOTTOM REGARDING THE CYLINDER SURFACE.

ANNOTATION

DIMENSION «A» MUST BE MEASURED WITHOUT GASKET ATTACHED TO «B»

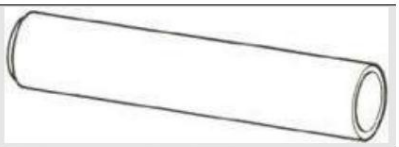
TABLE OF CONTENTS

TOOLS

WORK

SPECIAL TOOL

Stock code number	Description	
001330Y	Tool for installing steering head bearing cups	
001467Y002	Basket for bearings with outside diameter Ø 73 mm	
001467Y006	Pliers for removing 20 mm bearings	
001467Y007	Basket for bearings with outside diameter Ø 54 mm	
001467Y008	Pliers for removing bearings with Ø 17 mm	
001467Y014	Pliers for removing bearings with Ø 15 mm	

Stock code number	Description	
001467Y017	Basket for bearings with outside diameter Ø 39 mm	
001467Y031	Basket	
001467Y031	Pliers for removing bearings with Ø 15 mm	
001467Y035	Basket for bearings with outside diameter Ø 47 mm	
006029Y	Punch mandrel for installing steering bearing seats on the fork shaft	
020004Y	Punch mandrel for removing the steering bearings from the steering tube	

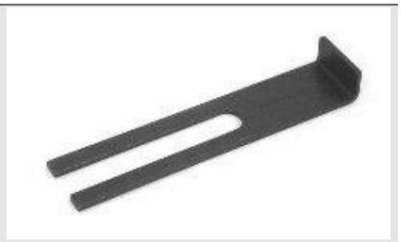
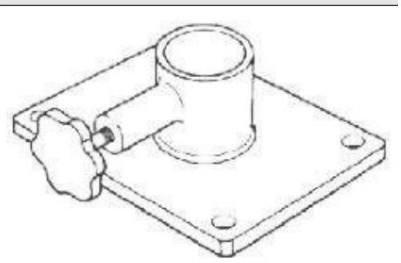
Stock code number	Description	
020055Y	Key for threaded ring fork shaft	
020193Y	Pressure gauge for oil pressure control	
020201Y	Tube for inserting the spacer bushing	
020262Y	Plate for housing separation	
020306Y	Impact mandrel for installing the valve sealing rings	
020335Y	Magnetic holder for dial indicator	

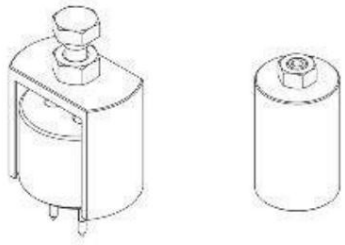
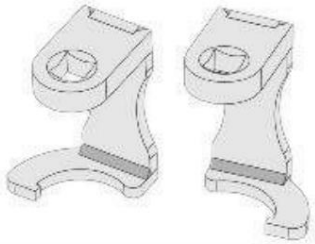
Stock code number	Description	
020357Y	Adapter 32 x 35 mm	
020358Y	Adapter 37 x40 mm	
020359Y	Adapter 42 x 47 mm	
020360Y	Adapter 52 x 55 mm	
020364Y	Guide 25 mm	
020376Y	Handle for adapter	

Stock code number	Description	
020382Y012	Cylindrical spacer (tool for removing the valves)	
020412Y	Guide 15 mm	
020424Y	Impact mandrel for installing the roller container of the guided pulley	
020431Y	Oil seal valve puller	
020434Y	Connection for oil pressure control	
020439Y	Guide 17 mm	

Stock code number	Description	
020444Y	Tool for attaching and removing the clutch to the guided pulley	
020456Y	Adapter Ø 24 mm	
020458Y	Lower steering tube bearing puller	
020459Y	Impact mandrel for installing bearings on the fork shaft	
020467Y	Flywheel puller	
020470Y	Assembly tool for piston pin retainers	

Stock code number	Description	
020472Y	Key to block the alternator	
020475Y	Tool for checking piston position	
020476Y	screw bolt	
020478Y	Punch mandrel for needle sleeve	
020479Y	Tool for blocking the countershaft	
020480Y	Fuel pressure control tool kit	

Stock code number	Description	
020482Y	Motor mount	
020483Y	Guide (30mm)	
020512Y	Fork for installing the piston	
020527Y	Motor mount stand	
020604Y011	Adapter to equip	
020648Y	Charge individual battery	
020565Y	Face wrench for blocking the alternator	

Stock code number	Description	
020661Y	Replacement kit for integral seal water pump	
020674Y	Clamp for installing the piston Ø 95 mm	
020892y	Key threaded ring for side steering tube	
020922Y	Diagnose-Instrument	
020924Y	Bluetooth for PADS diagnostic device	
021017Y	Diagnostic cable EOBD E5	

Stock code number	Description	
021021Y	Fuse drive pulley	
021022Y	Stop guided pulley	
021023Y	Key to lock the ring nut	
021024Y	Key to lock the control socket	

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MAINTENANCE WAR

REAR GAS SHOCK ADJUSTMENT

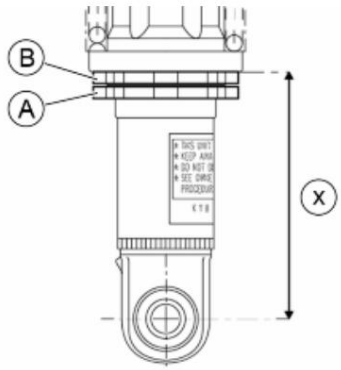
To adjust the preload of the rear gas shock absorbers, proceed as follows:

1. The special key for the shock absorbers Use setting, the key from below insert and with two teeth of the threaded ring connect.

2. Unscrew the lower threaded ring **«A»** until it is a few millimeters from the upper threaded ring.

3. Turn the adjusting threaded ring **«B»** until the prescribed values have been reached.

4. Pull the lower threaded ring **«A»** up to An Screw on the upper threaded ring and tighten.



Prescribed values «x»

Position 1 min. preload; driver only: **100 - 105 mm**

Position 2 max. preload; Driver, passenger and luggage: **119 mm**

DANGER

DRIVING WITH THE SPRING PRELOADING NOT PROPERLY ADJUSTED TO THE DRIVER AND PASSENGER WEIGHT CAN IMPROVE DRIVING COMFORT AND AFFECT DRIVING PRECISION.

WARNING

TO RISK OF INJURY (ABRASIONS).
AVOID SHOCK WHEN ADJUSTING
DAMPER PROTECTIVE GLOVES MUST BE WEAR.

WARNING

IT IS ABSOLUTELY ADVISED NOT TO USE THE INTRODUCTORY CREDITS
DIFFERENCE ON THE TWO SHOCK ABSORBERS
LIGHTLY ADJUST

DANGER

PERFORM THE ADJUSTMENT PROCESS WHEN THE EXHAUST IS COLD AND WEAR APPROPRIATE PROTECTIVE GLOVES AND WEAR CLOTHES.

ANNOTATION

WITH ITS TWO TEETH THE KEY CAN FOR THE INDIVIDUAL POSITIONS SHOWN IN BOTH DIRECTIONS CAN BE USED.

RESET MAINTENANCE SYMBOL

Every time you turn the ignition key to **"ON",** after the initial testing of the fitting boards if less than 300 km (186.41 mi) to missing for the next inspection, the flashes given symbol for 5 seconds.

When the mileage reaches the inspection is, the symbol remains every time the ignition is turned Pressing the key to **«ON»** switches it on permanently until the inspection is carried out.

To reset the maintenance symbol as follows proceed:

- select the **“BATTERY”** function .

- Press the **"SET"** button for more than 10 seconds hold down.

- When you release the button it will correspond de maintenance step reset and the symbol disappears.

METHOD FOR ADJUSTING THE THREADED RINGS ON THE SIDE STEERING TUBE

To tighten the threaded rings on the side

To adjust the steering tubes, proceed as follows:

- The windshield and the upper sports remove disc.

- Remove the front of the shield.

Use the special tool and as follows proceed:

- Loosen the upper threaded ring.

- The lower threaded ring with the specified tighten to the desired torque.

Torque guide values (N*m)

Lower threaded ring of the side steering tube res 4 ÷ 5

- Pull the upper threaded ring by hand until you reach the end screw tight.

- The upper threaded ring with the specified tighten to the desired torque.

Torque guide values (N*m)

Upper threaded ring of the side steering tube res 38 ÷ 42 Nm

- Reset the vehicle body.

Maintenance program table

SCHEDULED MAINTENANCE TABLE

I: CHECK AND CLEAN, ADJUST, LUBRICATE OR REPLACE AS NECESSARY.

C: CLEAN, R: REPLACE, A: ADJUST, L: LUBRICATE

km x 1,000 (mi x 1,000)	1 (0,6)	10 (6,2)	20 (12,4)	30 (18,6)	40 (24.9)	50 (31,1)	At 12 Sweet	At midnight Sweet
Safety locks	,	,		,		,		
spark plugs		R	R	R	R	R		
Main stand		L	L	L	L	L	L	L
Brake cable brake caliper suspension locking system		A	A	A	A	A		
drive belt		R	R	R	R	R		
Diagnosis with instrument	,	,	,	,	,	,	,	,
Air filters and seals		R	R	R	R	R		
Engine oil filter	R	R	R	R	R	R	R	R
Valve clearance			A		A			
Clutch unit		,	,	,	,	,		
Running shoes / variator rollers		R	R	R	R	R		
Guided pulley - roller container		,	,	,	,	,		
Electrical system and battery	,	,	,	,	,	,		
Brake system	,	,	,	,	,	,		
coolant	,	,	,	,	,	,	,	R
brake fluid	,	,	,	,	,	,	,	R
Engine oil	R	R	R	R	R	R	R	R
Rear gear oil	R	,	R	,	R	,	,	,
Headlight adjustment		,		,		,		
Brake pads	,	,	,	,	,	,	,	,
Tire pressure and wear	,	,	,	,	,	,	,	,
Test drive	,	,	,	,	,	,	,	,
suspension		,	,	,	,	,	,	,
Middle and side steering tube	A	A	A	A	A	A	,	,
Power transmission								,
Workload (minutes)	110	I 165	I 270	I 165	I 270	I 165	I 50	80

ANNOTATION

EVERY PROGRAMMED MAINTENANCE MUST BE CHECKED FOR THE EXISTENCE OF ANY ERRORS AND THE CORRECTNESS OF THE PARAMETERS USING THE DIAGNOSTIC DEVICE.

ENSURE THE VEHICLE CALIBRATION IS UPDATED AFTER YOU HAVE PERFORMED THE UPDATING OF THE DIAGNOSTIC DEVICE.

suggested products

The Piaggio Group recommends the products of "Official partner Castrol" for the planned regular maintenance of their vehicles.

Use lubricants and fluids that are the same have higher quality or higher specifications, than specified in the regulations. this is also valid for possible refilling.

TABLE OF RECOMMENDED PRODUCTS

Product	Description	Declarations
Engine oil 5W-40	Synthetic-based lubricant for The 4-Stroke Engine.	SAE 5W-40; JASO MA, MA2; API SL; THAT A3

Product	Description	Declarations
Gear oil 75W-140	Synthetic lubricant for gears and drives.	SAE 75W-140, API GL-5
Brake fluid DOT 4	Synthetic brake fluid.	SAE J 1703; FMVSS 116; ISO 4925; ASS AND NC 956 DOT4
Antifreeze ready to use, paint rot	Antifreeze based on ethylene glycol with added organic Corrosion inhibitors. Color red, ready to use.	ASTM D 3306 - ASTM D 4656 - ASTM D 4985 - CRADLE NC 956-16
Grease	Yellow-brown lithium-based grease and medium fiber, suitable for various Applications.	ISO LX-BCHA 3 - DIN 51 825 K3K -20
Liquid-repellent spray grease	Spray grease containing calcium, stringy, liquid-repellent.	White spray grease based on calcium complex soap NLGI 2; ISO-L-XBCIB2

CONVERSION UNIT - FROM ANGLO-SAXON SYSTEM TO INTERNATIONAL SYSTEM (AND).

Technical information	Description/Value
1 inch (in)	25,4 Millimeter (mm)
1 foot (ft)	0,305 Meter (m)
1 We (mi)	1,609 Kilometers (km)
1 Gallone US (gal US)	3,785 liters (l)
1 pound (lb)	0.454 Kilograms (Kg)
1 cubic inch (in^3)	16.4 cubic centimeters (cc)
1 pound foot (lb ft)	1,356 Newton Meter (N m)
1 mile per hour (mi/h)	1,602 kilometers per hour (km/h)
1 pound per square inch (PSI)	0,069 (Bar)
1 Fahrenheit (°F)	32+(9/5) Celsius (°C)

spark plug

The engine installed on the vehicle has two spark plugs.

Unscrew the fastening screw and the Flap on the left side of the vehicle **"A"** with help a small one inserted into the recess, Remove the screwdriver.

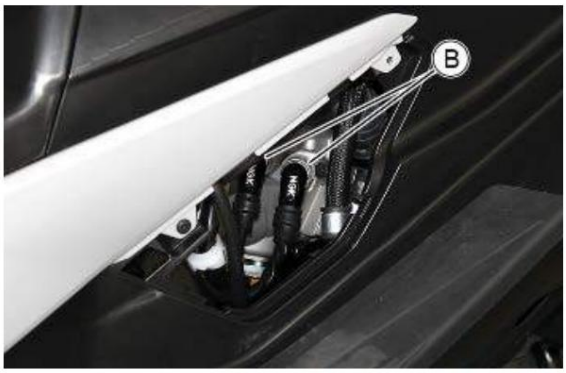
Proceed as follows:

1. Remove the ignition cable plug **«B»** from the ignition disconnect candles;

2. The spark plugs with a special spark plug Turn out the key

3. When reinstalling the spark plugs with the correct inclination all the way by hand tighten;

4. Use the candle wrench only for tightening turn around



5. Push the plug **«B»** onto the ignition as far as it will go

put candles;

6. Reattach the flap. Pay attention,

that the rear hook is inserted correctly.

DANGER

THE SPARK PLUGS MUST BE REMOVED WHEN THE ENGINE IS COLD. WORKING ON THE SPARK PLUGS ARE DESCRIBED IN THE SCHEDULED MAINTENANCE TABLE. THE USE OF NON-COMPLIANT TAX EQUIPMENT OR CONTROL DEVICES OR OTHER THAN THAT SPECIFIC SPARK PLUGS CAN CAUSE SERIOUS DAMAGE TO THE ENGINE.

ANNOTATION

THE USE OF SPARK PLUGS OTHER THAN THOSE SPECIFIED OR OF SPLITCH CAPS THAT ARE NOT SPARK SUPPRESSED MAY CAUSE MALFUNCTIONS IN THE VEHICLE ELECTRICAL SYSTEM.

Gear oil

control

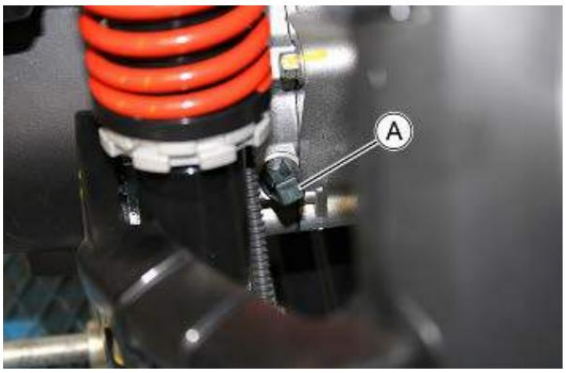
- Place the vehicle on level ground

Set the main stand.

- Unscrew the oil dipstick **«A»** with one

Clean with a clean cloth, reinsert and

screw it in completely.

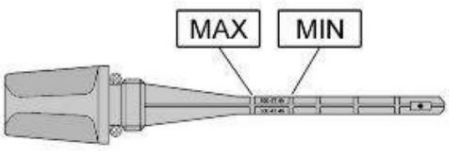


- Extract the dipstick checking the oil level

is between the **MAX** and **MIN indices;** in case

where the level is below the **MIN mark,**

it is necessary to restore the right quantity of oil in the hub.



- Screw the oil dipstick back in, checking that it is locked.

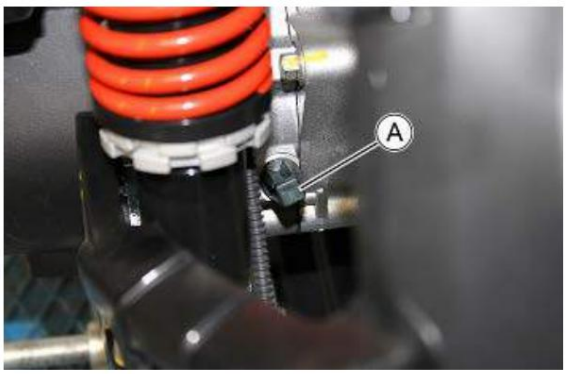
Suggested products

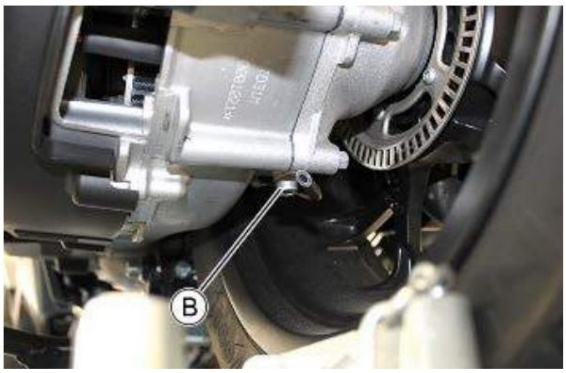
Gear oil 75W-140 Synthetic lubricant for gears and drives.

SAE 75W-140, API GL-5

Change

- Remove the oil filler cap «A».
- Unscrew the oil drain plug **«B»** and leave it flow the oil completely.
- Screw the drain plug back on and refill the hub with the prescribed oil.





Recommended products

Gear oil 75W-140 Synthetic lubricant for gears and drives.

SAE 75W-140, API GL-5

Technical specifications

Gear oil

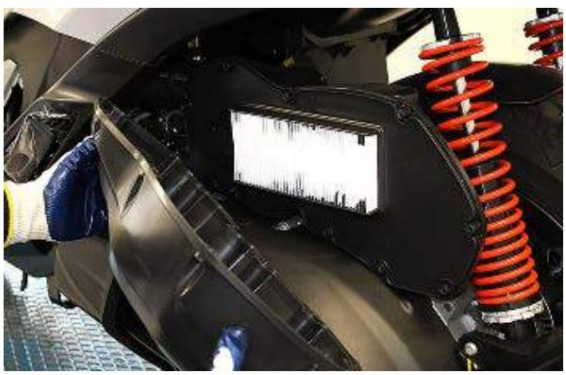
250 cm³

Air filter

To replace the air filter, proceed as follows:

- The fixing screws of the cover of the Unscrew and remove the air filter box.

- Remove the air filter box cover.



- Remove the filter element.

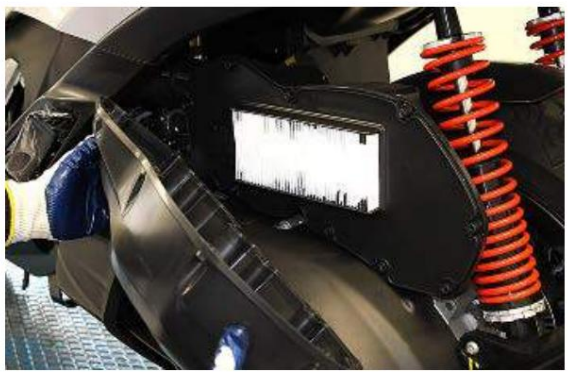
- The condition of the rubber seals on the profile

Check the filter box and cover.

- If they have cuts and/or tears, the

Replace seals.

- Insert a new filter element into its seat.



- Attach the lid.

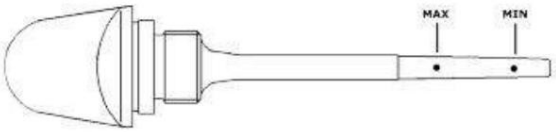
- The air filter housing mounting screws

Insert the lid and tighten it.

Engine oil

In 4-stroke engines, the engine oil becomes grease

tion of the valve control, the main bearings and the Cylinder-piston unit used. **Too little oil leads to inadequate lubrication and can cause serious engine damage.**



It is normal for all 4-stroke engines that the oil gradually loses its lubrication performance and, especially during the break-in period, a certain amount Amount of oil is consumed. Oil consumption will strongly determined by the operating conditions of the vehicle (e.g. when driving frequently at full throttle oil consumption increases).

Change

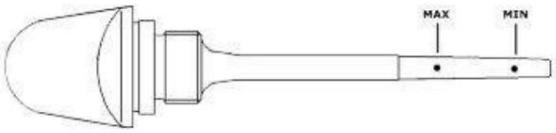
An oil change and filter change must be carried out accordingly be carried out according to the information in the maintenance program table. The oil must drained through the oil drain plug **«B»** become.

To make it easier for the oil to flow out, the oil Open filler screw/dipstick **«A» .**

Once the oil has stopped flowing from the

drain hole, unscrew the cartridge oil filter and re

move it.



Make sure the O rings are in good condition

Pre-filter and drain plug ring.

Lubricate them and refit the mesh filter and the

oil drain plug locking it to the torque

prescribed.

Refit the new cartridge filter carefully

lubricate the O-Ring before assembly.

Fill in the engine oil.

Since a certain amount of oil still remains in the

circuit, filling must be done with

oil from cap «A». Then start the vehicle, leave

turn it on for a few minutes and turn it off: afterwards

about 5 minutes check the level and if necessary

top up without ever exceeding the **MAX level.**

Replacing the cartridge filter must be

carried out at every oil change. For top-ups and

to replace, use new oil of the recommended type

liato.

ANNOTATION

THE OIL MUST BE CHANGED WITH THE ENGINE WARM.

Suggested products

Motor oil 5W-40 synthetic-based lubricant for 4-stroke engines.

SAE 5W-40; JASO MA, MA2; API SL; ACEA A3

control

This step must be carried out when the engine is cold

be carried out as follows:

- Place the vehicle on level ground

Set the main stand.

- Unscrew the filler cap with dipstick **«A»**

Use, dry with a clean cloth

zen and **screw it back in completely.**

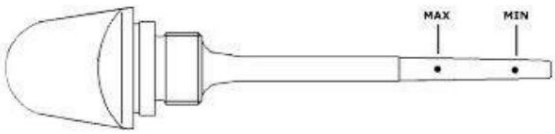
- Unscrew the filler cap with dipstick again

and check that the oil level is between the
MIN and MAX markings. If applicable
refill.

The oil level check is off when the engine is warm
the displayed oil level is lower. For
The engine must be switched off for a proper check
and about 10 before checking the oil level
Cool for minutes.

Refilling oil

Before topping up engine oil, you must first
the oil level must be checked. When refilling
Engine oil must **not exceed the MAX mark**
steps can be MAX.



Topping up from **MIN** to **MAX** requires approximately
400 cm³.

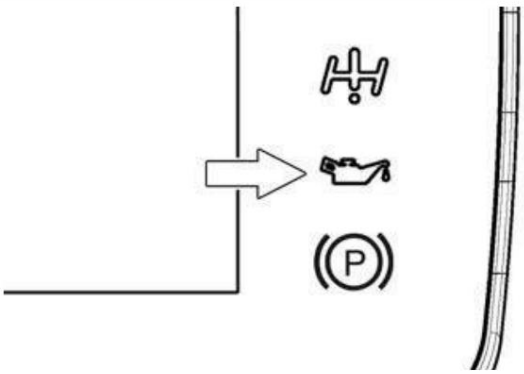
Suggested products

Motor oil 5W-40 synthetic-based lubricant for 4-stroke engines.

SAE 5W-40; JASO MA, MA2; API SL; ACEA A3

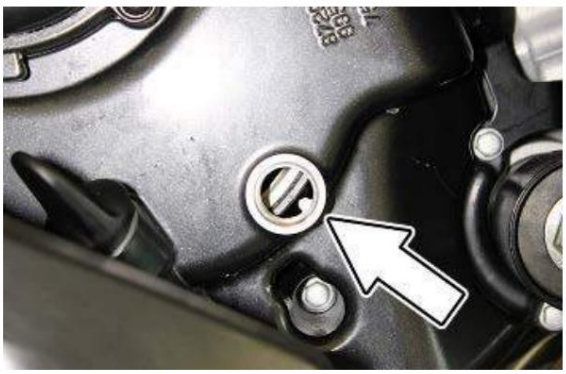
Oil pressure control

The vehicle has an oil on the dashboard
equipped with pressure control. The indicator light
lights up as soon as the ignition key is turned **«ON»**
is rotated. After starting the engine, the...
Oil pressure control goes out.
The oil pressure control lights up when braking
or when cornering, the oil level must be checked
and the lubrication system checked and given
if necessary, be filled up.



Check phase setting of valve control

- Remove the plastic cover from the alternator cover take.



- Turn the flywheel until the mark on the rotor as shown in the figure Marking on alternator cover aligned tet ist (OT).
- Make sure that the 4V mark on the Drive pulley of the camshaft onto the mark is aligned with the cylinder head. Located the marking is on the opposite one Side to the marking on the cylinder head must be the Crankshaft rotated another revolution become.

Check valve clearance

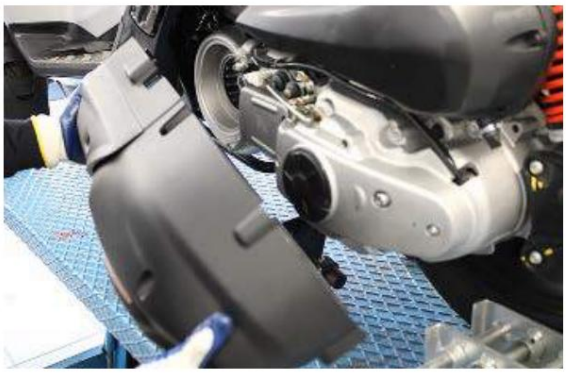
The valve clearance must be checked accordingly the information from the table for maintenance program can be carried out.

- Place the vehicle on a suitable bridge, so that the rear wheel can be blocked.
- Disconnect the battery cables.
- The luggage racks, the rear sides and the Remove running boards.
- A scissor lift under the vehicle attach.

- The fixing screws of the cover

Unscrew the cooling of the drive box.

- Remove the drive cooling cover.



- The inspection cover on the flywheel

loosen cover.

- Loosen the spark plug, turn the crankshaft

and the received references on the swing

Align the wheel and the crankcase.

- The fastening screw of the two rear ones

Loosen shock absorber.

- The rear brake mounting screw

unscrew pipes.

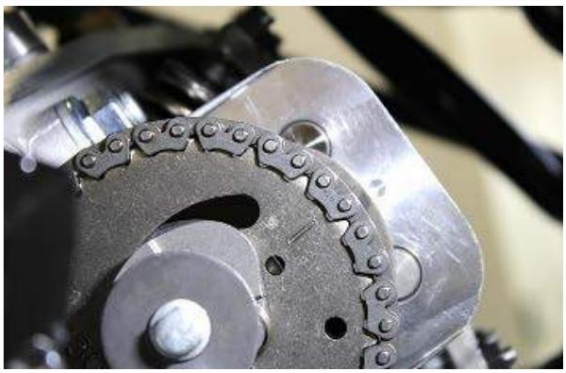
- Open the frame by operating the pulley of the vehicle. The engine runs one slight rotation between the rear wheel and the Swing arm through.

- The connecting rod head rises and increases the space between the tappet cover and the container.

- The tappet cover mounting screws loosen and remove.

- Remove the tappet cover.

- The alignment of the marking on the cylinder head check with the one on the distributor ring.



- Use a thickness gauge to check the clearance between A Check position and valve.

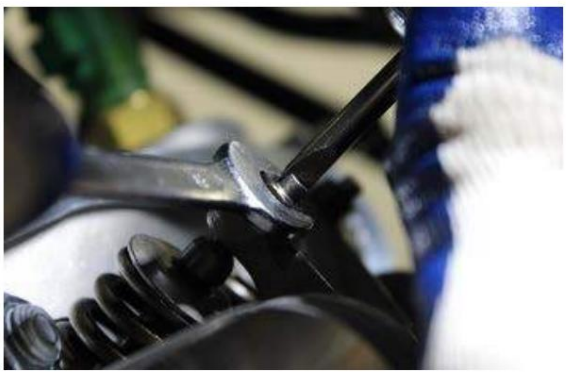
Technical specifications

Valve clearance (cold)

Suction: 0.15mm

Outlet: 0.15mm

- If an incorrect value is determined, on and bring it to the prescribed value gen.



- Install the valve lifter cover.
- Insert the special screws with dampers.
- Fastening screws in order 1-2-3-4 with specified tightening torque put on.

Torque guide values (N*m)

Valve cover fixing screws 7 ÷ 9 Nm (5.2 ÷ 6.6 lb*ft)

- The rear brake mounting screw

insert and tighten.

- Lower the vehicle using the lifting device

ken until the lower fastening of the rear shock

damper with the appropriate fasteners

aligned on the engine.

- Insert the fastening screws for both shock absorbers

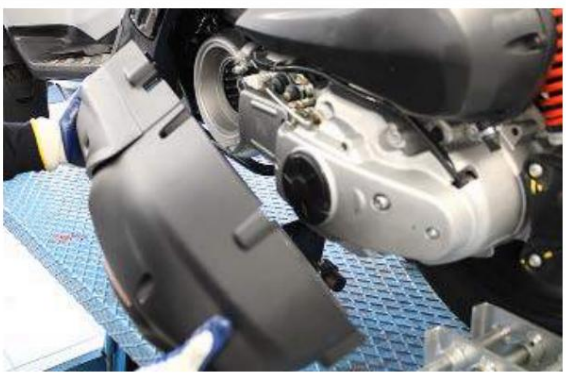
and with the required tightening torque

tighten momentarily.

- The inspection cover on the flywheel

Insert cover and tighten.

- Install the drive cooling cover.



- Reinstall the running boards, rear sides and luggage rack.

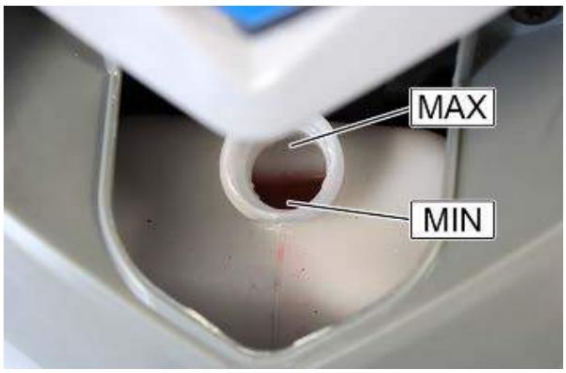
- Connect the battery cables.

Cooling system

The coolant level must be checked
cold engine according to the information from the
Table for the maintenance program can be made
as follows:
- Place the vehicle on level ground
Set the main stand.
- Unscrew the screws shown in the picture and
remove the cover of the expansion box
remove the barrel.

Unscrew and remove the lid.

- Refill again if the fluid level
is near or below the MIN mark.
The fluid level must always be between
MIN and MAX markings. - The coolant is a
mixture of decalcified water and antifreeze based
on ethylene glycol
and rust inhibitors.



DANGER

TO PREVENT COOL FLUID LEAKING FROM THE EXPANSION TANK WHILE DRIVING
AVOID NOT EXCEEDING THE MAX MARK WHEN FILLING.

Suggested products

Antifreeze ready for use, color red
Antifreeze based on ethylene glycol with added organic corrosion inhibitors. Color red, ready to use.

ASTM D 3306 - ASTM D 4656 - ASTM D 4985 -

CRADLE NC 956-16

Brake system

Level control

BRAKE FILL LEVEL CHECK

SYSTEM FRONT AND REAR

The brake fluid reservoirs for the front and Rear brakes are on the handlebars. How

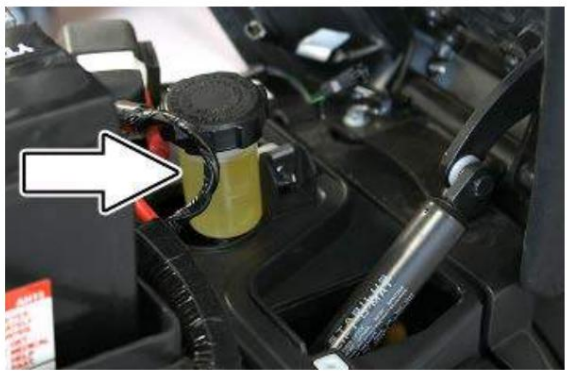
proceed as follows:

- The vehicle is aligned in the direction of travel Place the handlebars on the main stand.
- Check the brake fluid level through the corresponding sight glass. A slight drop in the brake fluid level can occur caused by wear on the brake pads.

FLUID CONTROL AT THE INTEG

RAIL BRAKE SYSTEM

- Place the vehicle on level ground Set the main stand.
- Remove the control cover and check whether the Level of brake fluid in the reservoir written area can be read.
- A slight drop in brake fluid tands can be caused by wear of the brake pads be caused.



Refill

REFILLING THE FRONT BRAKE SYSTEM

AND BACK

Proceed as follows for both master brake cylinders:

- Loosen the two fastening screws and remove the lid. To refill finally prescribed brake fluid to use. Never fill above the maximum level.

Under normal climatic conditions must the brake fluid according to the information from the maintenance program table be changed.

WARNING

**USE ONLY CLASS DOT 4 BRAKE FLUID. THE BRAKE FLUID IS HIGHLY CORROSIVE:
AVOID CONTACT WITH PAINTED VEHICLE PARTS.**

DANGER

**AVOID BRAKE FLUID IN EYES,
COMES INTO CONTACT WITH SKIN OR CLOTHING. IF INTENTIONAL CONTACT RINSE IMMEDIATELY WITH PLENTY OF RUNNING WATER.**

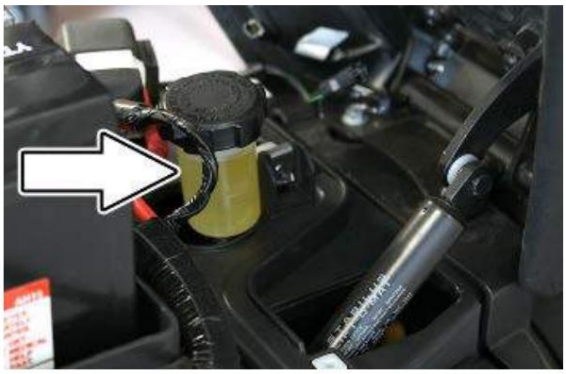
Suggested products

Brake fluid DOT 4 Synthetic brake fluid.

SAE J 1703; FMVSS 116; ISO 4925; CUNA NC 956 DOT4

REFILLING THE INTEGRAL BRAKE SAN MAKE

- Remove the inspection cover, unscrew the container cover and use the recommended Refill product.
- If there is air in the line, the Vent the system.



DANGER

**THE PRESENCE OF AIR IN THE CIRCUIT OF THE INTEGRAL BRAKE SYSTEM IS PARTICULARLY DANGEROUS:
THE USE OF THIS BRAKE SYSTEM CAN PUMP AIR INTO THE LINES OF THE FRONT OR REAR WHEEL BRAKES AND THEREFORE THE FUNCTION OF THE RESTRICT INDIVIDUAL BRAKE SYSTEMS.**

Suggested products

Brake fluid DOT 4 Synthetic brake fluid.

SAE J 1703; FMVSS 116; ISO 4925; CUNA NC 956 DOT4

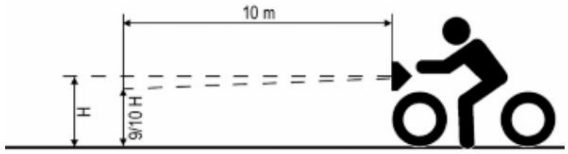
Adjusting the headlight

Proceed as follows:

- The vehicle is ready to drive, unloaded and with correct tire pressure on a flat surface in 10 m distance in front of a white one in partial shade the wall, the vehicle axle must be at right angles to the wall.

- Remove the upper shield cover.

- Turn on the headlight and check that the upper light-dark boundary on the wall does not about 9/10 of the center of the headlight from the ground and is not less than 7/10.



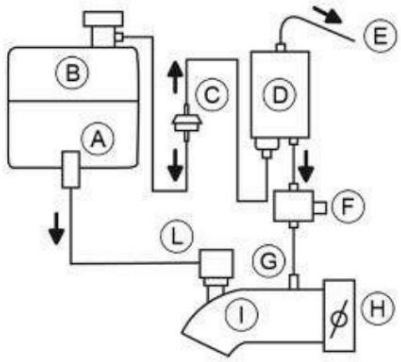
- Otherwise adjust the headlight by the corresponding screws can be turned.

WARNING

THE PROCEDURE SPECIFIED IS SPECIFIED BY THE "EUROPEAN STANDARD" FOR THE MAXIMUM AND MINIMUM HEIGHT OF THE HEADLIGHT BEAM. NEVERTHELESS, THE APPLICABLE REGULATIONS IN THE INDIVIDUAL COUNTRIES OF USE OF THE VEHICLE MUST BE CHECKED.

anti-evaporation system

The vehicle is equipped with the "canister", the essential component of the system for controlling the Ver vapor emissions of fuel equipped, in accordance with current standards.



A. Fuel pump

B. Gas tank

C. Two-way fuel vent valve

dampen

D.Activated carbon filter

E. Vent pipe to the environment F.

Unidirectional electronic force

material vapor vent valve (from the engine control unit

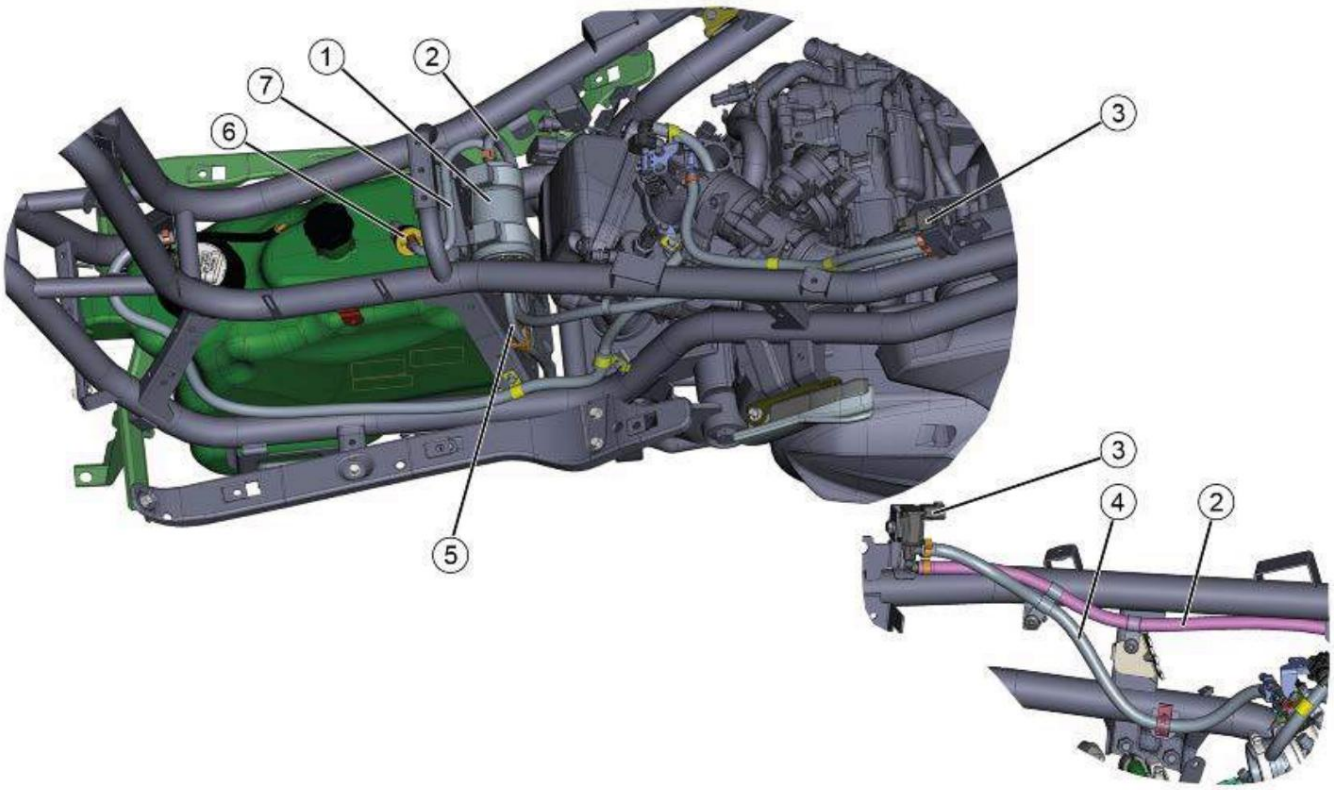
advises controlled)

G. Vacuum connection

H. Throttle body

I. Air intake manifold

L. Injector



Legend:

1. Activated carbon filter

2. Connection line from the solenoid valve to the activated carbon filter

3. Activated carbon filter solenoid valve

4. Connection line from the solenoid valve to the input connection

5. Vent line

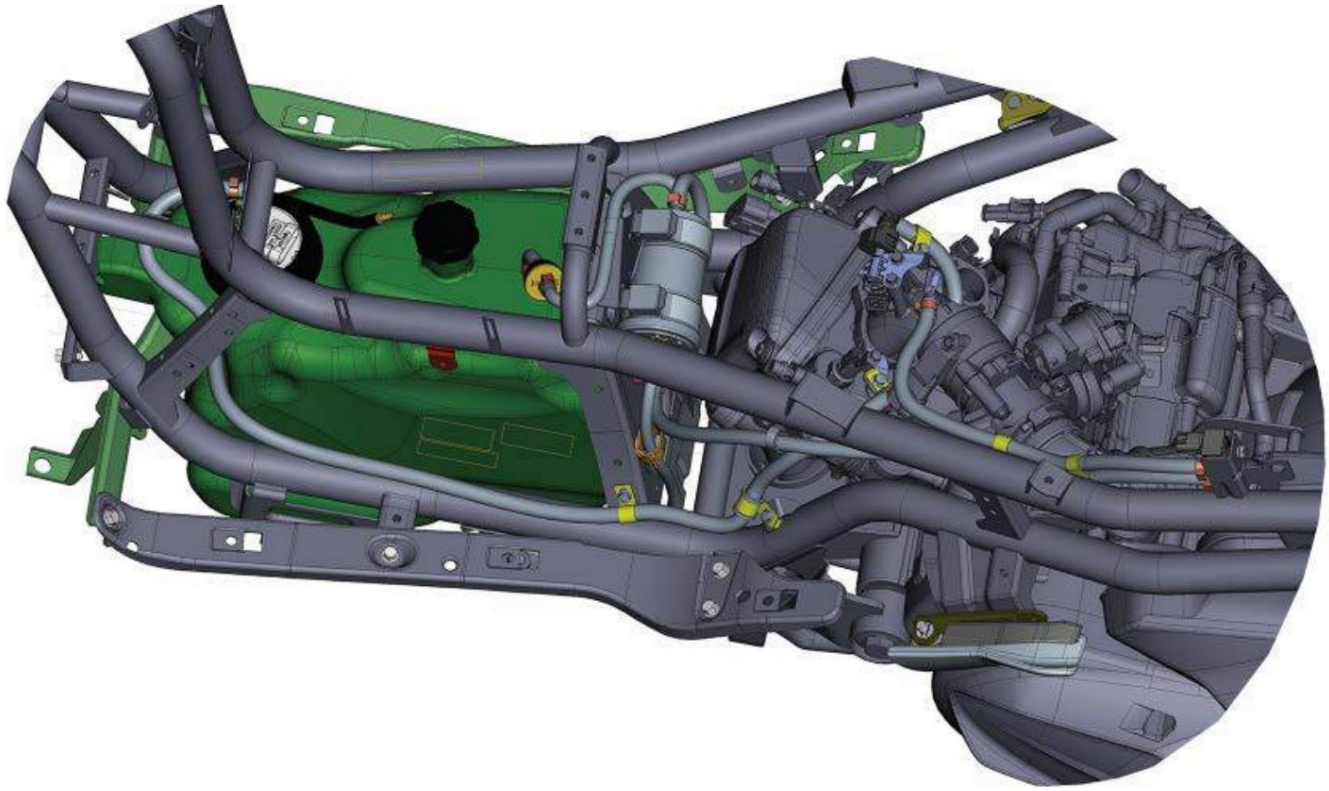
6. Ventilation valve

7. Connection line from the fuel tank to the activated carbon filter

disassembly of system components

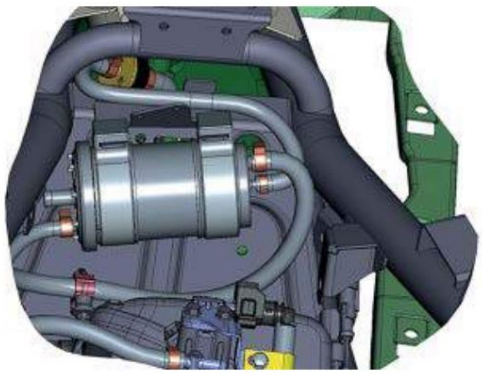
To access the components of the system to limit evaporative emissions

Remove the helmet compartment and the side panels.



Remove the pipe clamps and the activated carbon filter

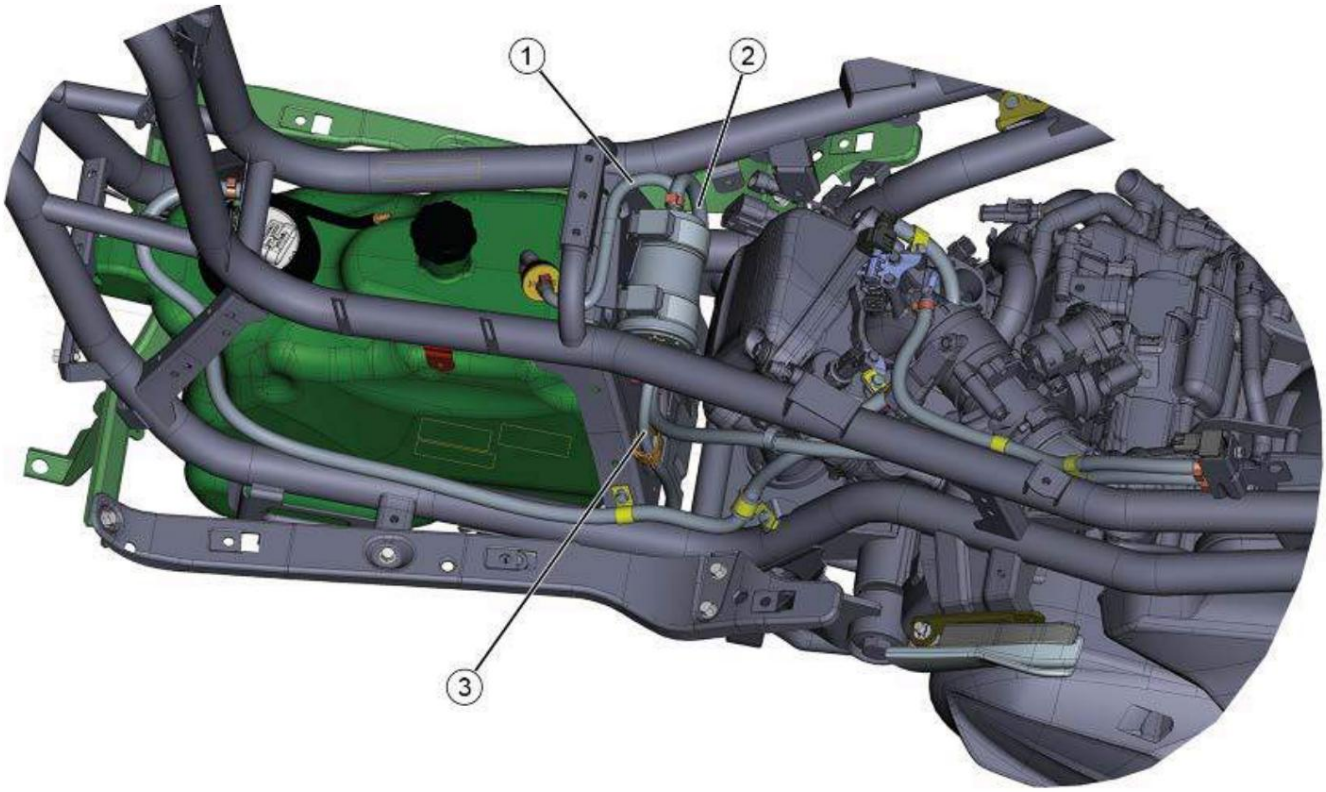
pull it out of its holder.



assembly of system components

When reinstalling the components, pay attention to the connection of the lines to the activated carbon filter

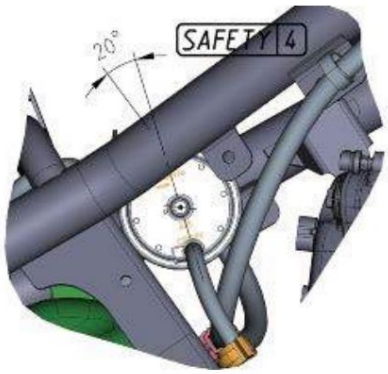
ten.



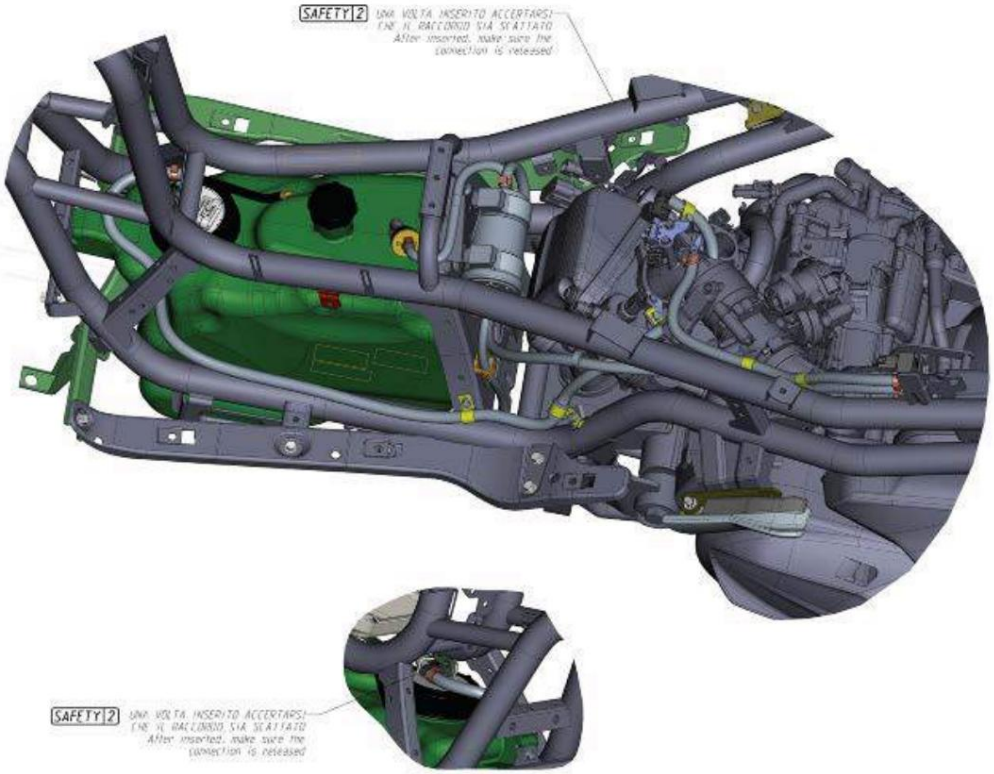
Legend:

1. Connection line from the fuel tank to the activated carbon filter
2. Connection line from the solenoid valve to the activated carbon filter
3. Vent line

Make sure the activated carbon filter is installed correctly is directed.

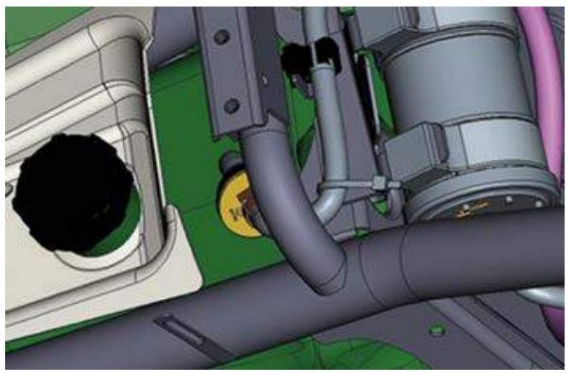


When installing the fuel line, ensure that it is properly attached to the tank.



When reinstalling, pay attention to the alignment of the ven

tils pay attention.



DANGER

ENSURE THE CORRECT INSTALLATION DIRECTION OF THE COMPONENTS. IF YOU

IF MOUNTED REVERSE, THIS MAY AFFECT THE OPERATION OF THE ENTIRE EVAPORATION PREVENTION SYSTEM.

After assembling the components, fasten the cables with new clamps.

check canister

The activated carbon filter is essential for treating the hydrocarbons present in the gas volume

are present, which escapes from the tank when the internal pressure increases (heating of the tank due to

the radiator, the engine or the environment).

Even if the amount of hydrocarbons coming from the tank is quite small, the
Activated carbon is regenerated by a reverse flow of ambient air sucked in by the engine
to avoid saturation of the activated carbon filter.
This pollution and regeneration phenomenon of coal occurs every time it is used
cycle of the vehicle.

To check the activated carbon filter, it must be checked
be removed, with the 2 lines attached
remain closed.

- Shake and check the activated carbon filter
  check whether noises can be heard.
- Alternate with a compressed air gun
  blow into the 3 lines and safe
  that inside the Ak
  Activated carbon filter does not form any pressure.
- Make sure the air flow is always
  is free and that from no line
  Coal residues escape.

If you notice noises, blockages or Koh
If oil losses are detected, replace the activated carbon filter
rare.

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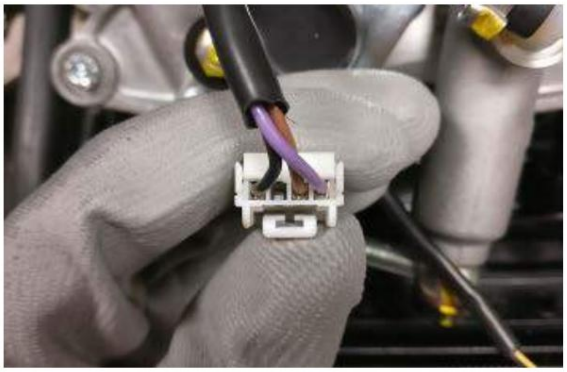
ELECTRICAL SYSTEM THEY ANL

DANGER
ANNOTATION
THE GRAPHIC REPRESENTATION OF THE CABLE CONNECTORS SHOULD BE UNDERSTANDED FROM THE CABLE ENTRY SIDE, AS SHOWN IN THE EXAMPLE.



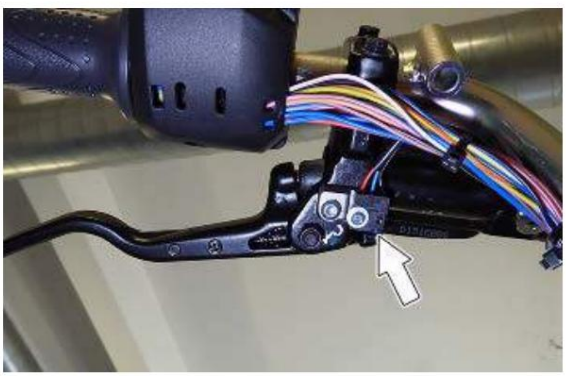
Attaching the components

1. Right brake lever stop switch

Remove handlebar covers to access.

2. Left brake lever stop switch.

Remove handlebar covers to access.



3. Brake pedal stop switch.

To access, remove the right footboard.

4. Preparation for heating accessories

Remove handlebar covers to access.

5. Air temperature sensor.

In the lower handlebar cover.

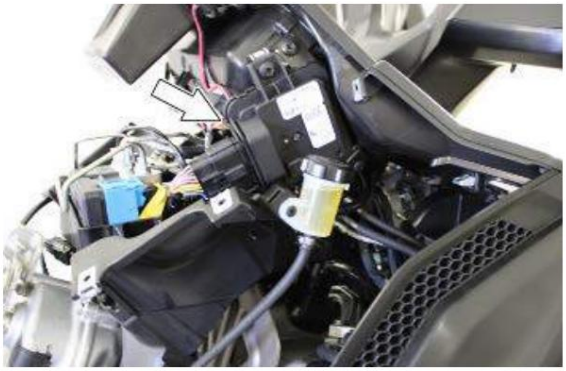
6. Keyless switch contacts

To access, remove the back of the shield.

7. PMP3

To access the component, use the above

Remove the remaining part of the shield.

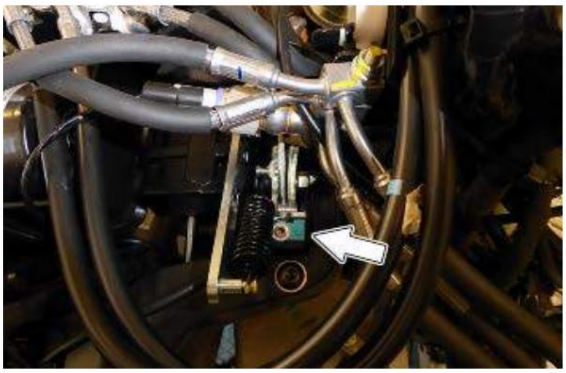


8. Sensor mechanical brake caliper roll

Lock

To get to the component, the front one

Remove shield.



9. Roll-Lock hydraulic pressure sensor

To get to the component, the front one

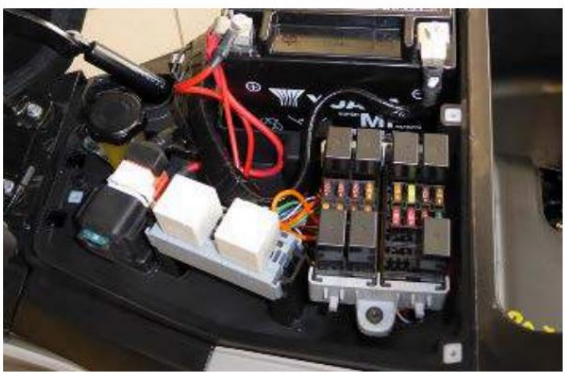
Remove shield.

10. Terminal board remote switch and fuse

gen

Under the seat, for access to the battery

Remove cover.



11. Flasher

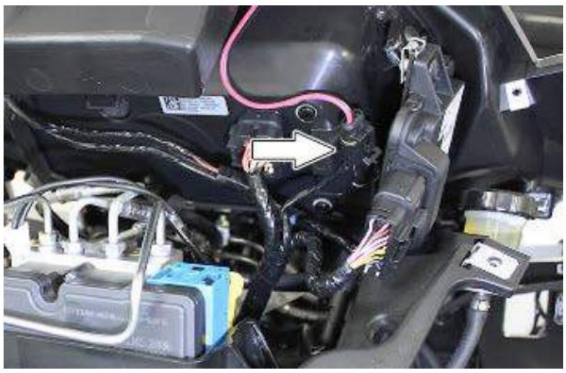
On the left side of the vehicle for access

Remove rear side panel.

12. Cable connector USB socket

To get to the component, the front one

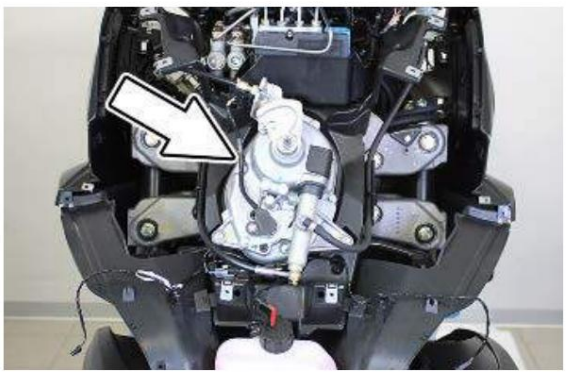
Remove shield.



13. Stellmotor Roll-Lock

To get to the component, the front one

Remove shield.



14. Rotary sensor end stop

To get to the component, the front one

Remove shield.

15. Parking brake control unit In order to access the component, the The back of the shield must be removed.

16. Parking brake switch

In order to get to the component, you have to The back of the shield must be removed.

17. Fuel pump

In order to get to the components, you have to middle frame panel must be removed.

18. Voltage regulator

In order to get to the component, you have to right rear side panel must be removed.

19. Oil pressure sensor

On the right side of the engine.

20. Ignition coil.

Positioned on the left side of the vehicle to

To access the component, remove the left side panel distant.

21. Fuel filler flap opening adjustment device

In order to get to the component, you have to

The back of the shield must be removed.

22. Warnsummer

In order to get to the component, you have to

Helmet compartment can be removed.

23. Injection control unit 11MP

Located on the right side of the vehicle. Around
To be able to get to the component, you have to
Helmet compartment can be removed.

24. Driver detection sensor cable connector

The driver presence sensor is in the seat
installed, the connection is located at the seat
bench hinge. To access the bench
clap.

25. Cable connector pre-equipment for heated seat bank

The cable connector is located on the seat
hinge. Open the bench for access.

26. ABS control unit

To get to the component, the front one
Remove shield.

27. Reverse gear actuator assembly

In order to get to the component, you have to
Protective cover of the drive cover removed
become.

28. Reverse gear motor

The box of contacts of the positive cable of the Mo

The reverse gear gate is on the left side
of the vehicle, above the drive cover
tight.

In order to get to the component, you have to
Drive cover must be removed as described in chapter. «Mon
gate» is described.

29. Cooling fan

In order to get to the cable connector, the
Remove back of shield.

30. Speed sensors.

The sensors are located on the inside of the
Front suspension.

31. Lambda sensor

The lambda sensor is located on the exhaust manifold

mer. To expose the cable connector, the right

Remove rear side panel.

32. ABS sensor rear wheel

The rear wheel ABS sensor is located on

Engine, between the wheel and the left rear

Shock absorber.

In order to get to the cable connector, that

Remove helmet compartment.

33. Starter motor

In order to get to the component, you have to

Helmet compartment can be removed.

34. Seat opening adjustment device

In order to be able to access the component, the hint

Remove the other side parts.

35. Injector

In order to get to the component, the In

Remove the inspection flap in the helmet compartment.

36. Engine temperature sensor

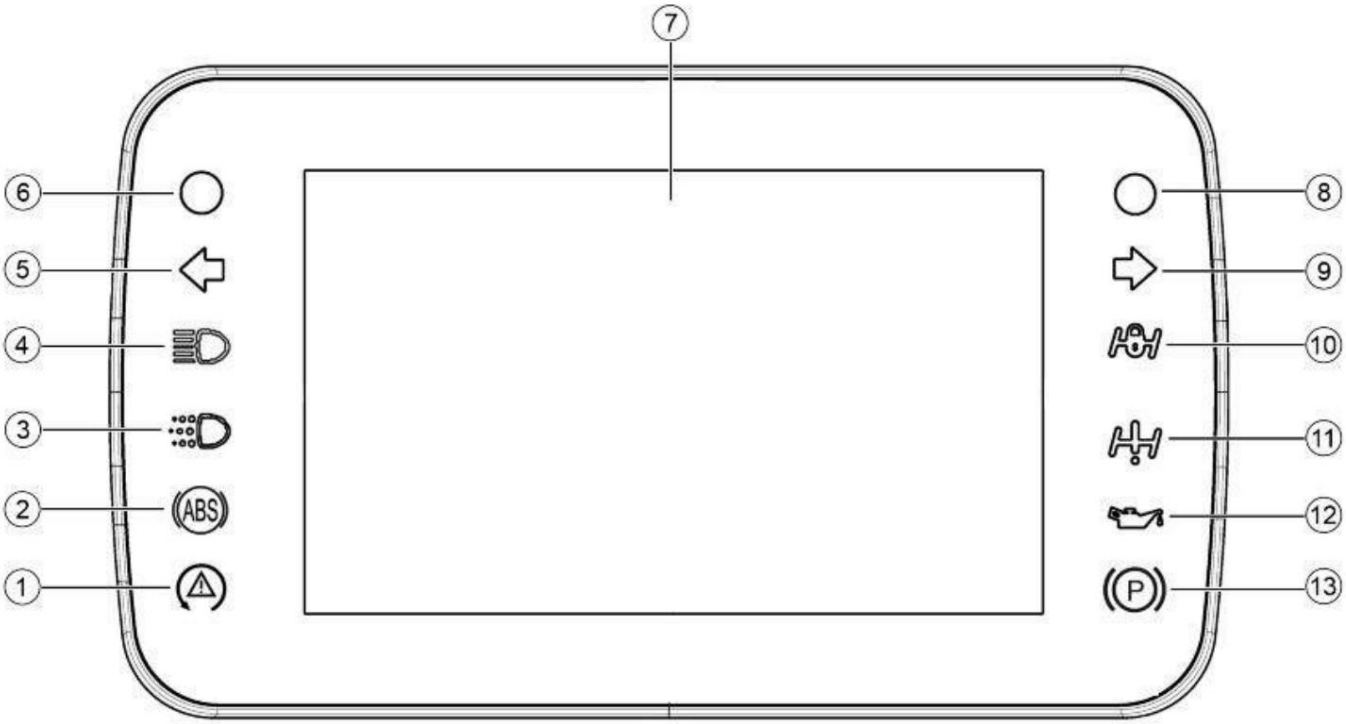
In order to get to the component, you have to

Helmet compartment can be removed.

37. Demand-Sensor

Located on the right side of the handlebar

dashboard



Legend:

1 = ASR indicator light

2 = ABS indicator light

3 = Daytime Running Lights indicator light switched on

4 = High beam indicator light switched on

5 = left indicator light

6 = Brightness sensor Digital display

7 = Digitaldisplay

8 LED immobilizer

9 = Right turn signal indicator light

10 = Indicator light for locking system (roll lock system) front suspension active

11 = Warning lamp malfunction locking system (Roll-Lock system) front suspension

12 = Insufficient engine oil pressure indicator light

13 = Parking brake indicator light activated

Checking the power output of the charging system

Check for possible leakage current

1) Remove the corresponding cover under the seat and clear access to the battery give.

2) Before checking the output voltage, check that no battery fluid has come out of the battery tery exits.

3) Turn the ignition key to OFF and connect the tester terminals between the negative (-) terminals.
on the battery and the black cable. Only then remove the black cable from the negative pole
Disconnect (-) at the battery.
4) With the ignition key still OFF, the ammeter must show a value of ÿ 0.5 mA.

Check charging voltage

WARNING

BEFORE CHECKING, MAKE SURE THE BATTERY IS IN GOOD CONDITION.

1) Place the vehicle on the main stand.
2) With the battery properly connected to the circuit, connect the tester terminals between the
Switch battery poles.
3) Start the engine, slowly increase the speed and measure the voltage at the same time.

Electrical information

Voltage between 14.0 and 15.0 V at 5000 rpm.

Control maximum delivered current

- With the engine switched off and the ignition lock set to "ON", switch the vehicle lights on and off
Wait until the battery voltage reaches 12V.
- Connect a clamp current meter to the 2 positive battery charge cables at the output of the controller
eat.
- Start the engine and bring it to high speed, at the same time take the reading on the clamp meter
read off.

VOLTAGE REGULATOR/RECTIFIER

Technical information	Description/Value
Type	Transistorized, non-adjustable three-phase
Tension	14 ÷ 15V at 5000 rpm with lights off

Lamp list

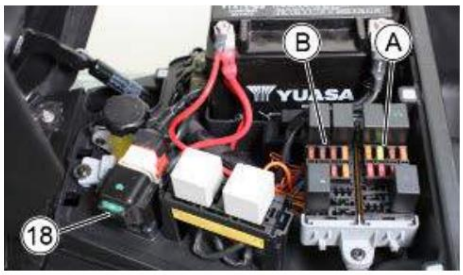
In this section the equipment is included
Types of lamps provided for the vehicle
counted.

LAMP TABLE

	Electrical information	Description/Value
1	Low beam lamp	**Typ:** LED **Quantity:** 1 RIGHT - 1 LEFT
2	High beam lamp	**Typ:** LED **Quantity:** 1 RIGHT - 1 LEFT
3	Lamp front parking light / daytime running light	**Typ:** LED **Quantity:** 1 RIGHT - 1 LEFT
4	Front turn signal lamp	**Typ:** LED

	Electrical information	Description/Value
		Quantity: 1 RIGHT - 1 LEFT
5	Taillight lamp	**Typ:** LED **Quantity:** 1
6	Rear turn signal lamp	**Typ:** LED **Quantity:** 1 RIGHT - 1 LEFT
7	Brake light	**Typ:** LED **Quantity:** 1
8	Lamp license plate light	**Typ:** LED **Quantity:** 1
9	Lamp for helmet compartment lighting	**Type:** TORPEDO **Power:** 12V - 5W **Quantity:** 1

Fuses



The electrical system is equipped with 16 main protection fuses, which are divided into two fuse boxes **«A»** and **«B»** and one

General security **“18”,** which is located near the battery is located.

To access the fuses, the seat must be raised and the battery cover removed

as described in the **“Battery”** section becomes.

DANGER

BEFORE REPLACING A BLOWN FUSE, THE FAULT THAT CAUSED THE FUSE TO BLOW MUST BE LOCATED AND REMOVED. NEVER USE THE CIRCUIT

ANOTHER MATERIAL (E.G. A CABLE) OR A FUSE OTHER THAN THAT STATED BRIDGE (E.G. WITH A LARGER NUMBER OF AMPERS).

DANGER

WITHOUT CONCERNING THE TECHNICAL DATA INCORRECT CHANGES OR REPAIRS TO THE ELECTRICAL SYSTEM CAN CAUSE OPERATING MALFUNCTIONS CAUSE AND ARE FIRE HAZARD.

WARNING

TO AVOID DAMAGE TO THE ELECTRICAL SYSTEM, NEVER DISCONNECT THE BATTERY CABLE WHILE THE ENGINE IS RUNNING.

MAIN BACKUP

The table shows the position and the technical

information about the devices in the vehicle

neral fuse listed.

TABLE MAIN BACKUP

	Electrical information	Description/Value
1	Fuse No. 18	**Power:** 30A **Supply:** from battery **Protected circuits (under ignition switch):** Fuses No. 1, 2, 3, 4, 5, 6, 7 and 8 (fuse holder «B»).

FUSE HOLDER «A»

The table shows the positions and the technical

information about those in the vehicle

Main fuses described, which are safe

holder **«A» .**

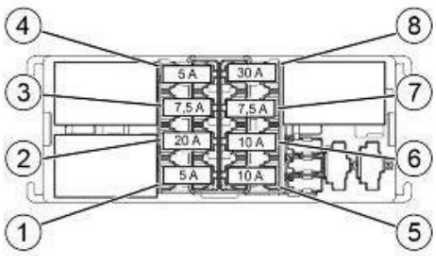


TABLE OF FUSES BOX «A»

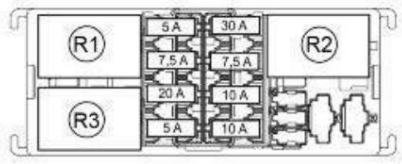
	Electrical information	Description/Value
1	Fuse No. 1	**Power:** 5A **Protected circuits:** Supply via fuse No. 1 (fuse holder «B»); Light change switch High beam/low beam.
2	Fuse #2	**Power:** 20A **Protected circuits:** Power supply via battery; Parking brake control unit.
3	Fuse #3	**Power:** 7.5A **Protected circuits:** Power supply via battery; Preparation of alarm system, preparation of heated grips, Diagnostic socket.
4	Fuse #4	**Power:** 5A **Protected circuits:** Power supply via battery; Instrument unit.
5	Fuse #5	**Power:** 10A **Protected circuits:** Power supply via battery; Remote relay cooling fan, cooling fan.
6	Fuse #6	**Power:** 10A **Protected circuits:** Power supply via battery; Remote relay injection loads, engine control unit.
7	Fuse #7	**Power:** 7.5A **Protected circuits:** Power supply via battery; Helmet compartment lighting, alarm system preparation, Control element for direction indicators (turn signals), control

	Electrical information	Description/Value
		PMP3 (Piaggio Multimedia Platform) control unit, “Keyless” control unit, electrical storage compartment preparation.
8	Fuse #8	**Power:** 30A **Protected circuits:** Power supply via battery; ABS control unit.

The table shows the positions and the technical

technical specifications of the relays are described in

Fuse holder **«A»** is housed.



KASTEN “A” RELAY TABLE

	Electrical information	Description/Value
	Relay No.	**Circuits:** main circuit.
1	1 Relay No.	**Circuits:** cooling fan.
2 3	2 Relay No. 3	**Circuits:** fuel pump.

FUSE HOLDER «B»

The table shows the positions and the technical

information about those in the vehicle

The main fuses are described and are housed

in the fuse holder **«B» .**

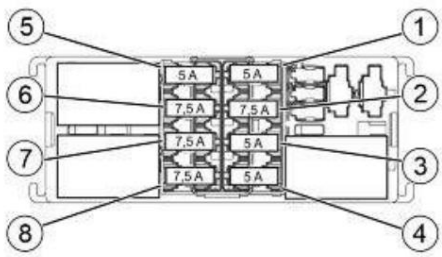


TABLE OF FUSES BOX «B»

	Electrical information	Description/Value
1	Fuse No. 1	**Power:** 5A **Protected circuits:** Power supply via ignition lock; USB port.
2	Fuse #2	**Power:** 7.5A **Protected circuits:** Power supply via ignition lock; Pre-equipment of alarm system, pre-equipment of heated grips, diagnostic socket.
3	Fuse #3	**Power:** 5A **Protected circuits:** Power supply via ignition lock; Direction indicator control (indicator), indicator switch, PMP3 (Piaggio Multimedia Platform) control unit, electrical storage compartment preparation.
4	Fuse #4	**Power:** 5A **Protected circuits:** Power supply via ignition lock; Daytime running light changeover switch, daytime running light remote relay, instrument cluster.
5	Fuse #5	**Power:** 5A

	Electrical information	Description/Value
		Protected circuits: Power supply via ignition lock; Remote brake light relay, rear brake light, coil Remote starter relay.
6	Fuse #6	**Power:** 7.5A **Protected circuits:** Power supply via ignition lock; Parking brake control unit.
7	Fuse #7	**Power:** 7.5A **Protected circuits:** Power supply via ignition lock; "Keyless" control unit, ABS control unit, engine control unit.
8	Fuse #8	**Power:** 7.5A **Protected circuits:** Power supply via ignition lock; Horn switch, horn, rear radar, parking lights front and daytime running lights, rear parking lights, license plate light, rear camera, instrument cluster.

The table shows the positions and the technical

technical specifications of the relays are described in

Fuse holder **«B»** is housed.

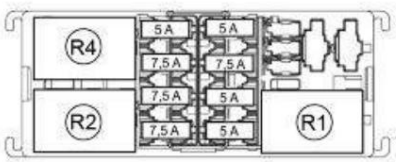


TABLE RELAY BOX «B»

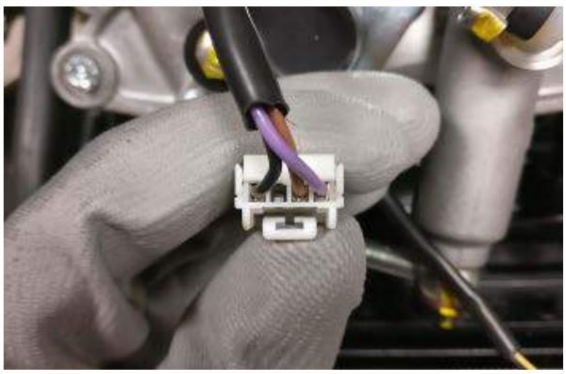
	Electrical information	Description/Value
	Relay No.	**Circuits:** Daytime running light changeover switch.
1	1 Relay No.	**Circuits:** enabling reverse gear.
2 3	2 Relay No. 4	**Circuits:** brake lights.

Cable connections

DANGER

ANNOTATION

THE GRAPHIC REPRESENTATION OF THE CABLE CONNECTORS IT IS VIEWED FROM THE CABLE ENTRY SIDE UNDERSTAND AS SHOWN IN THE EXAMPLE.



The following is the list of electrical components of the vehicle:

- Seat opening adjustment device
- Tank adjusting device
- Battery
- Ignition coil.
- Bulk wire mesh
- Development CAN
- ABS control unit

- Parking brake control unit
- Injection control unit

• Horn

• Ignition lock

- Light switch
- Ignition actuator contact
- Starter remote relay contact
- Flasher unit
- cooling fan
- Taillight
- Solenoid group
- Instrument unit
- License plate lighting
- injector
- Helmet compartment lighting switch
- Front right turn signal
- Front left turn signal

• LED Alarm

- Helmet compartment lighting

• Ignition coil ground.

• Frame dimensions

- Gear motor
- Starter motor
- Pick-Up
- Helmet compartment lighting

• PMP3

- Fuel pump
- Preparation for anti-theft protection
- Preparation for top case
- Preparation for heated grips, leg warmers and seat heating
- Diagnostic connector

• USB port

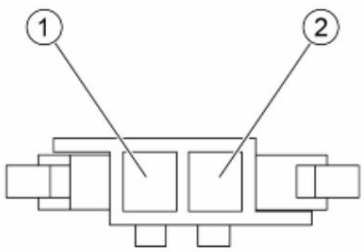
- Headlight
- Button switch on heating
- Seat opening switch
- Tank opening button
- Taste ASR
- Limit switch

- Handbrake switch
  - Brake pedal switch
  - Brake light switch on the right
  - Left brake light switch
- Voltage regulator
  - Selector switch for drive/reverse gear operating mode
  - Front ABS sensor right
  - Front ABS sensor on the left
- Rear ABS sensor
- Tilt sensor
  - Throttle grip position sensor
  - Seat sensor (driver present)
- Pressure sensor
  - Oil pressure sensor
  - Rotation sensor
- Outside temperature sensor
  - Engine temperature sensor
- Sensor T_MAP
  - Speed sensor right
  - Speed sensor on the left
  - Solenoid valve actuator ignition
- Lambda probe with heater
- Summer
- Rear view camera
  - Starter remote relay
  - Remote relay reverse gear
  - Activated carbon filter valve

CABLE CONNECTOR ACTUATOR SEAT

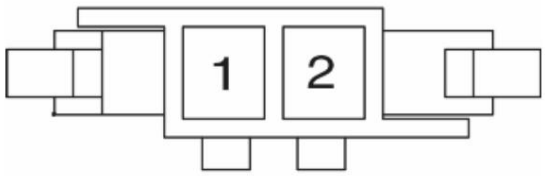
BANK OPENING

1. Ground (Black)
2. Power supply (Yellow-Gray)



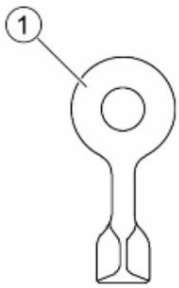
CABLE PLUG ADJUSTMENT DEVICE FOR TANK

1. Ground (Black)
2. Control input for tank opening via keyless (yellow Red)



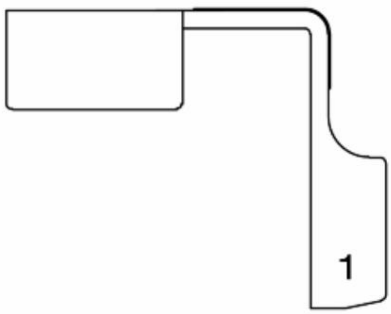
BATTERY-PLUS

1. Power supply (red)



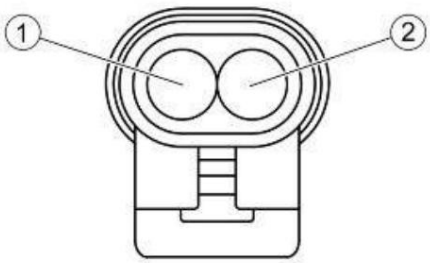
BATTERY-MINUS

1. Ground (Black)



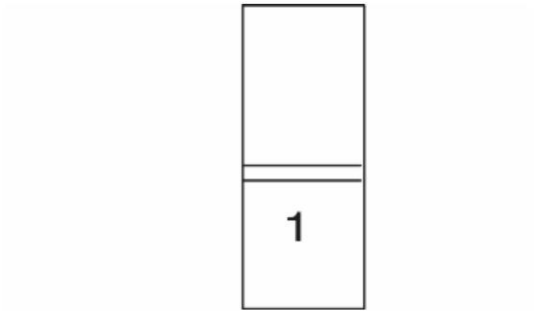
IGNITION COIL CABLE CONNECTOR.

1. Remote relay injection charges (black-green)
2. Injection control unit (pink-black)



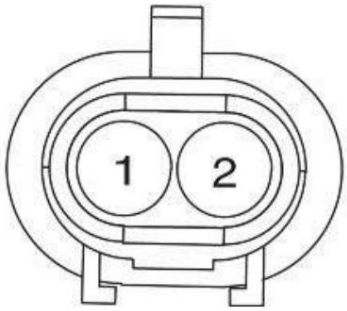
MASS DUTY

1. Ground black

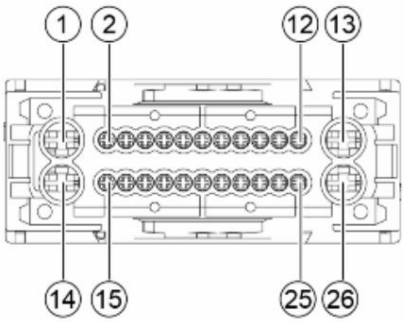


CABLE CONNECTOR DEVELOPMENT CAN

1. Line CAN H (Orange-Grey)
2. Line CAN L (orange-light blue)



ABS CONTROL UNIT CABLE CONNECTOR



1. Powered by battery (red)
2. Rear ABS sensor ground (brown-black)
3. Rear ABS sensor signal (brown-red)
4. Not connected 5. Front

right ABS sensor signal (purple-red)

6. Ground ABS sensor, front right (purple-black)
7. Not connected 8. Front

left ABS sensor ground (light blue black)

9. Signal ABS sensor front left (light blue-red)

10. ABS indicator light (orange)

11. Not connected **12.** Not

connected **13.** Not

connected **14.** Not

connected **15.** Not

connected **16.** Not

connected **17.** Not

connected **18.** Line K

(Orange - Black)

19. Not connected

20. Power supply via ignition lock (orange

Blue)

21. CAN L line (pink-white)

22. Mass (Black)

23. Line CAN H (Rosa-Rot)

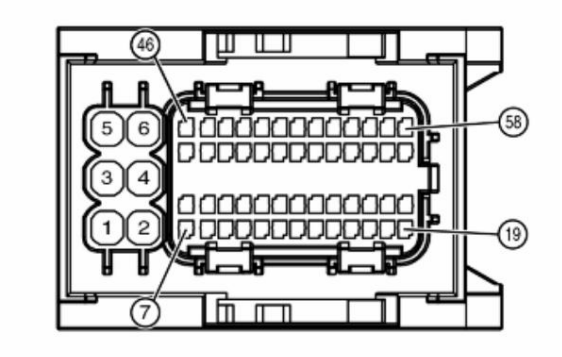
24. Not connected

25. Not connected

26. Mass (Black)

CONTROL UNIT CABLE CONNECTOR FIXED

PARKING BRAKE



1. Powered by battery (Blue - Red)
2. Powered by battery (Blue - Red)
3. Ground (Black)
4. Ground (Black)
5. Servomotor (yellow)
6. Gear Motor (Blue)
7. Not connected
8. Not connected
9. Not connected

10. Not connected

11. Not connected

12. Not connected

13. Not connected

14. Not connected

15. Not connected

16. Not connected

17. Not connected

18. Not connected

19. CAN line H (red-pink)

20. Suspension lock/unlock button (blue yellow)

21. Lock/unlock suspension button (purple black)

22. Not connected

23. Not connected

24. Not connected

25. Not connected

26. Seat sensor (purple)

27. Rotation sensor (green-blue)

28. Limit switch button (brown)

29. Limit switch button (brown-white)

30. Pressure sensor (white)

31. Not used

32. CAN L line (pink-white)

33. Lock/unlock suspension button (green degree)

34. Not connected

35. Right speed sensor ground (schwarz-rot)

36. Left speed sensor ground (green black)

37. Ground sensors (green-black)

38. Not connected

39. Not connected

40. Not connected

41. Not connected

42. Not connected

43. Not connected

44. Not connected

45. Speed sensor right (red)

46. Power supply via ignition lock (yellow Black)

47. Power supply via ignition lock (yellow Black)

48. Not connected

49. Power supply rotation sensor (orange blue)

50. Not connected

51. Not connected

52. Not connected

53. Not connected

54. Not connected

55. Horn (Yellow-pink)

56. Not connected

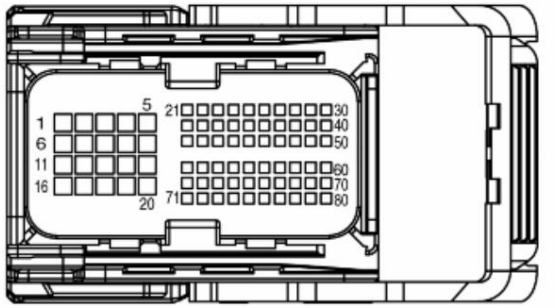
57. Summer (grau)

58. Speed sensor left (green)

INJECTION CONTROL UNIT

1. Signal -DC M throttle body (gray-black)

2. Not connected
3. Not connected
4. Not connected
5. AKF valve (white-black)
6. Signal + DC M throttle body (Red-Blue)
7. Not connected
8. Not connected
9. Not connected
10. Lambda sensor heater (white-blue)
11. Not connected
12. Not connected
13. Not connected
14. Not connected
15. Injector (Red-Yellow)
16. Not connected
17. Ignition coil. (pink-black)
18. Not connected
19. Not connected
20. Not connected
21. Not connected
22. Signal TPS1 throttle body (orange-white)
23. Lambda signal (-) (light blue-black)
24. Lambda signal (+) (green-blue)
25. Not connected
26. Not connected
27. Not connected
28. Not connected
29. Solenoid Coil Signal (Light Blue-Red)
30. Not connected
31. Not connected
32. Cruise Control Speed Increase Signal (Yellow/Gray)
33. Cruise Control Speed Reduction Signal (Yellow/Red)
34. Signal activation/deactivation cruise control (yellow/white)
35. Not connected 36. Not connected
37. Not connected
38. Not connected
39. Not connected
40. Not connected



41. Not connected **42.** Not connected **43.** Not connected **44.** Ground sensors (purple-black)

45. Ground sensors (gray-green)

46. Ground sensors (black-yellow)

47. Not connected **48.** Not connected **49.** Reverse motor coil signal (white-violet)

50. Not connected **51.** TPS2 throttle body signal (green-orange)

52. Not connected **53.** Not connected **54.** Power supply for solenoid group (Brown Rot)

55. Not connected **56.** Not connected **57.** T-MAP sensor power supply (Green Rot)

58. Not connected **59.** Brake pedal switch (White-Gray)

60. Signal (+) Pick-Up (Rot)

61. Not connected **62.** Not connected **63.** Air temperature signal T-MAP sensor (Yellow Blue)

64. Not connected **65.** Not connected **66.** Not connected **67.** Power supply throttle body (Red Black)

68. Brake pedal switch (white-pink)

69. Not connected **70.** Signal (-) Pick-Up (Brown)

71. Signal air pressure T-MAP sensor (yellow-green)

72. Not connected **73.** Motor temperature sensor (light blue-green)

74. Not connected

75. Ground sensors (gray-brown)

76. Not connected

77. Not connected

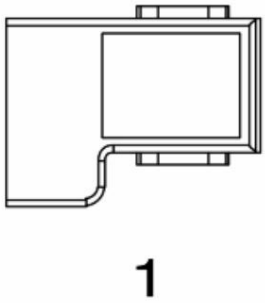
78. ASR button (light blue-white)

79. Not connected

80. Not connected

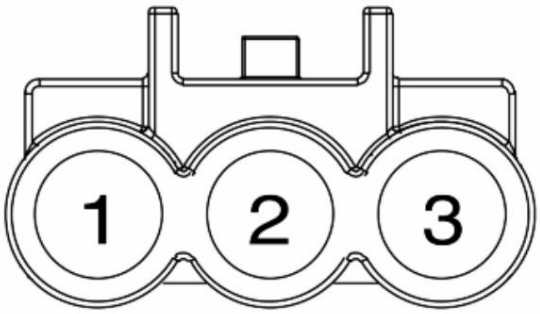
HORN CABLE CONNECTOR

1. Ground (Black)
2. Power supply (yellow-pink)



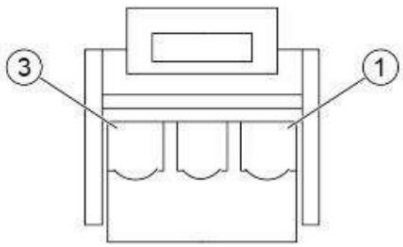
IGNITION CABLE CONNECTOR

1. Input power supply from fuse F18 (rot-schwarz)
2. Output switched plus (orange)
3. Not connected



CABLE PLUG CHANGE SWITCH

1. Contactor control DRL (yellow-pink)
2. DRL (yellow-brown)
3. Headlight (yellow-red)

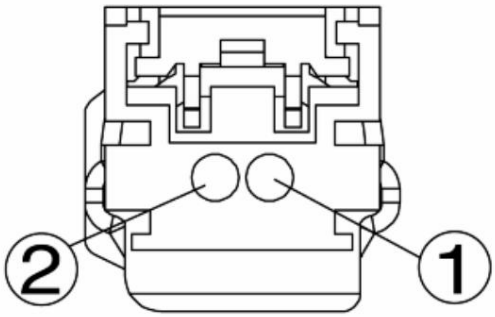


CABLE CONNECTOR CONTACT ACTUATOR

CAUTION FOR IGNITION

1. Signal contact actuator for ignition (purple-white)

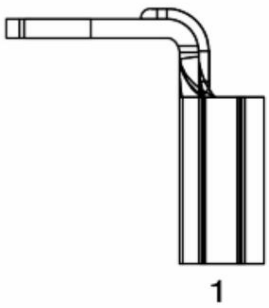
2. Mass (Brown - Black)



CABLE CONNECTOR CONTACT STARTER

REMOTE RELAY

1. Powered by battery (Red)

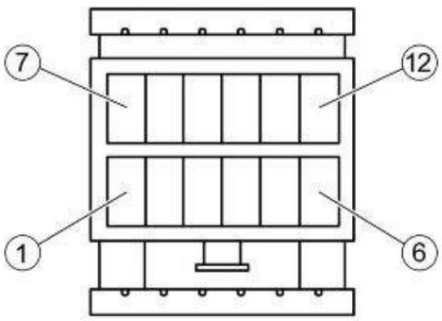


CABLE CONNECTOR THROTTLE BODY

1. Signal TPS1 injection control unit (orange White)
2. Power supply from injection control unit (Rot-Schwarz)
3. Signal + DC M injection control unit (red-blue)
4. Signal TPS2 injection control unit (green-orange ge)
5. Signal - DC M injection control unit (Gray Black)
6. Ground reference via injection control unit (Black yellow)

FLASHER CABLE CONNECTOR

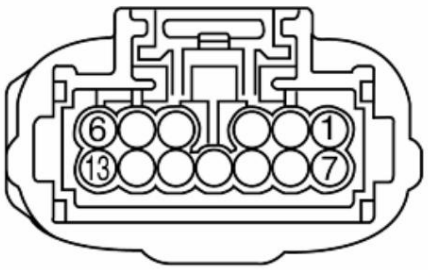
1. HAZARD button (brown-purple)
2. Signal input switch on control left turn signal (rot-degree)
3. Signal input switch-on control right blink ker (light blue)
4. Signal output switch on control left turn signal (rosa)



5. Signal output switch-on control right blink
ker (white-blue)
6. Powered by battery (Red-Blue)
7. Not connected
8. Power supply via ignition lock (brown
Rot)
9. Ground (Black)
10. Not connected
11. Signal deactivation turn signal (blue-white)
12. Not connected

ELECTRONIC CABLE CONNECTOR

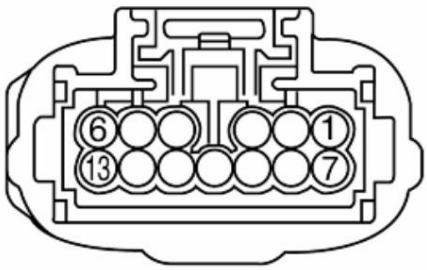
DIRECTION RE



1. Signal to stop the engine for injection
expensive device (gray)
2. Ground switch to stop the engine
right (black-yellow)
3. Signal to stop the engine for injection
expensive device (yellow-blue)
4. Ground switch for switching off the engine left
(gray-green)
5. Power supply starter switch (orange
Blue)
6. Signal output from starter switch (purple)
7. Power supply hazard warning lights button
(Brown-Red)
8. Signal output from hazard warning lights button
(brown-violet)
9. Suspension unlocking signal (blue-yellow)
10. Parking brake control unit (green-gray)
11. Suspension unlocking signal (purple
Black)
12. Mass button management suspension (black
Green)
13. Not connected

ELECTRONIC CABLE CONNECTOR

DIRECTION LE



1. Power supply turn signal switch (brown-red)

2. Ground Joystick (Black-Yellow)

3. Signal for instrument unit from Joy stick button on top (pink-yellow)

4. Signal for instrument unit from Joy stick button below (pink-gray)

5. Signal for instrument unit from Joy stick button on the left (white-pink)

6. Signal for instrument unit from Joystick button on the right (pink-brown)

7. Right turn signals (Red-Gray)

8. Turn signal deactivation button (blue-white)

9. Left turn signals (light blue)

10. Cruise speed increase signal

Control for injection control unit (yellow-gray)

11. Signal activation/deactivation Cruise Con

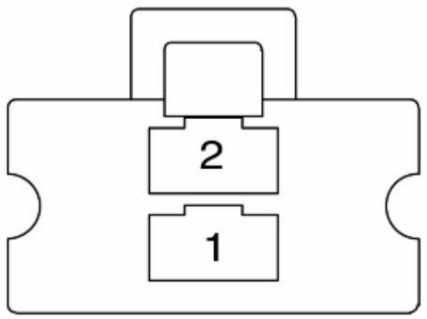
trol

12. Cruise speed reduction signal

Control for injection control unit (yellow-red)

13. Masse Cruise Control (Grau-Braun)

COOLING FAN CABLE CONNECTOR



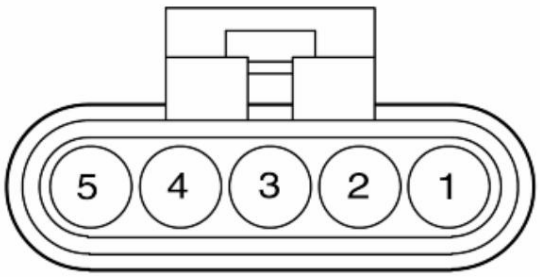
1. Input power supply via remote relay

Cooling fan (red-gray)

2. Ground (Black)

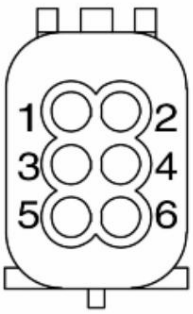
TAIL LIGHT CONNECTOR

1. Brake light (white-black)
2. Rear parking light (light blue)
3. Right turn signal signal (white-blue)
4. Signal link Flashing (pink)
5. Ground (Black)



CABLE CONNECTOR SOLENOID GROUP

1. Supply via solenoid relay (Green)
2. Signal from injection control unit (brown-red)
3. Ground reference via injection control unit (Vio lett-black)
5. Not connected
6. Signal for injection control unit (brown)



INSTRUMENT UNIT CABLE CONNECTOR

1. Not connected
2. Signal (-) rear camera (orange-blue)
3. Signal (+) Rear view camera
4. Fuel level signal (white-green)
5. Air temperature sensor (Yellow - Blue)
6. Joystick top button (pink-yellow)
7. Not connected
8. Not connected
9. Battery Power (Red-White)
10. Handbrake switch (yellow-black)
11. Joystick bottom button (pink-gray)
12. Not connected
13. Low engine oil pressure signal (pink-black)
14. High beam indicator light (purple)
15. Welcome LED Keyless
16. Power supply via ignition lock (yellow-red)
17. Battery Power (Red-White)
18. Not connected
19. Turn signal control right (white-blue)
20. Blinkerkontrolle links (rosa)

21. LED immobilizer (yellow-orange)

22. Joystick button right (pink-brown)

23. Joystick left button (white-pink)

24. Mass (Black)

25. Ground sensors (black-yellow)

26. Not connected

27. DRL indicator light (yellow)

28. Parking light indicator light (light blue)

29. Not connected

30. Not connected

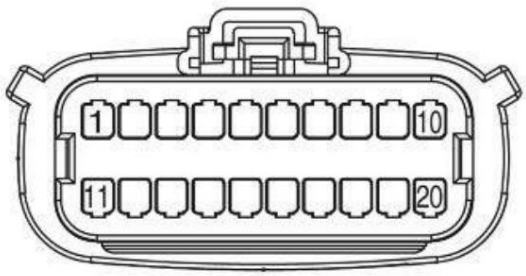
31. Not connected

32. CAN L line (pink-white)

33. Line CAN H (Rosa-Rot)

34. Not connected

CABLE CONNECTOR KEYLESS



1. Powered by battery (Red-Blue)

2. Signal (+) solenoid coil actuator for ignition dung (green-white)

3. Ground (Black)

4. Signal (-) solenoid coil actuator for ignition dung (green-black)

5. CAN H line (Rosa-Rot)

6. CAN L line (pink-white)

7. Preparation for electrical storage compartment (light blue yellow)

8. Seat opening adjustment device (yellow - gray)

9. Tank cap adjusting device (yellow-red)

10. Signal link Flashing (pink)

11. Signal input from contact actuator for Ignition (purple-white)

12. Power supply via ignition lock (orange - Blue)

13. Not connected

14. Input control seat opening button (brown-yellow)

15. Control input tank opening button (brown-red)

16. Mass (Brown - Black)

17. Switch-on control LED immobilizer (yellow orange)

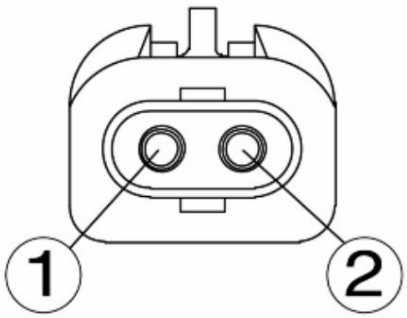
18. Ground for comfort LED (gray)

19. Not connected

20. Signal right turn signal (white-blue)

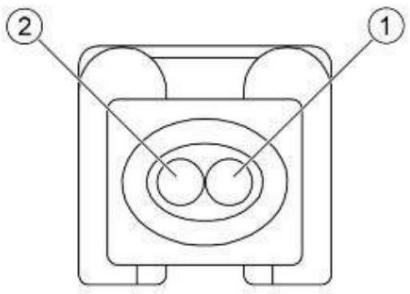
CABLE PLUG NUMBER PLATE LIGHTING

1. Power supply via ignition lock (light blue)
2. Ground (Black)



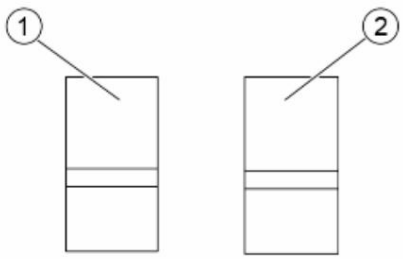
INJECTOR CABLE CONNECTOR

1. Power supply via remote injection relay dungs (black-green)
2. Minus from control unit (red-yellow)



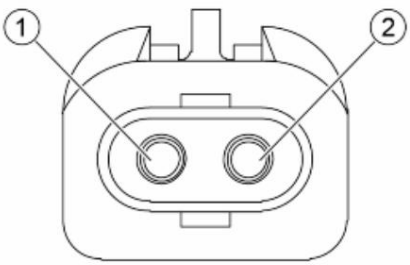
CABLE CONNECTOR FOR HELMET COMPARTMENT LIGHTING

1. Power supply battery (Red-Blue)
2. Helmet compartment lighting (blue-black)



FRONT RIGHT CABLE CONNECTOR FLASHING

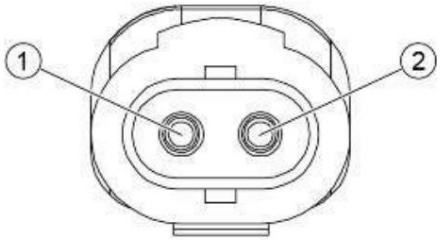
1. Power supply (White-Blue)
2. Ground (Black)



FRONT LEFT BLIN CABLE CONNECTOR

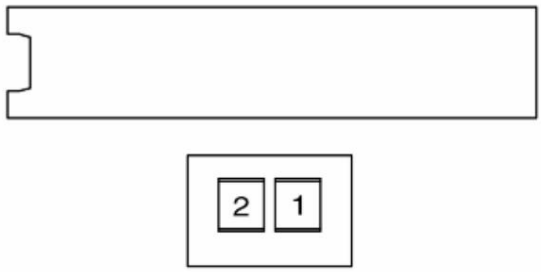
BECAUSE

1. Power supply (pink)
2. Ground (Black)



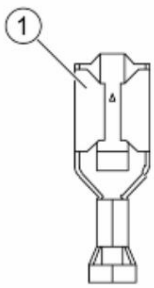
ALARM LED CABLE CONNECTOR

1. Ground (Black)
2. Preparation for anti-theft protection (red)



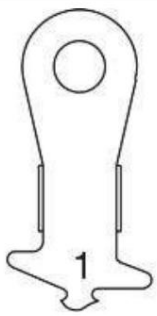
IGNITION COIL GROUND

1. Ground (Black)



FRAME DIMENSIONS

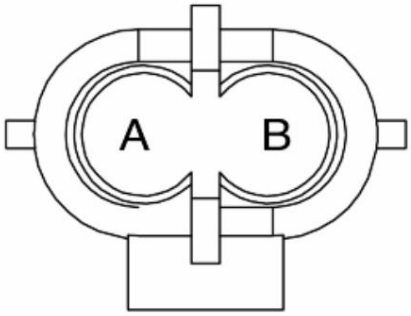
1. Ground (Black)



CABLE CONNECTOR ACTUATOR

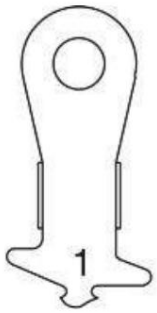
A. Parking brake control unit (yellow)

B. Parking brake control unit (blue)



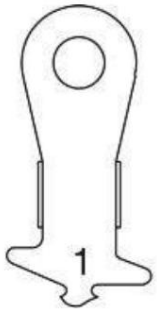
PLUS STARTER MOTOR

1. Power supply (red)



MINUS STARTER MOTOR

1. Ground (Black)

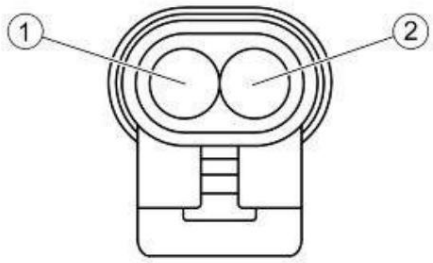


PLUS MOTOR FOR REVERSE GEAR

1. Reverse gear motor (Red)

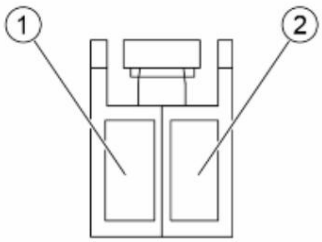
CABLE CONNECTOR PICK-UP

1. Injection control unit (red)
2. Injection control unit (brown)



CABLE CONNECTOR FOR HELMET COMPARTMENT LIGHTING

1. Power supply (Blue-Black)
2. Ground (Black)



PMP3

1. CAN H line (Rosa-Rot)

2. Power supply via ignition lock (brown Rot)

3. Signal output right turn signal (white-blue)

4. Signal output left turn signal (pink)

5. Follow me switch-on control (yellow)

6. Flasher unit (yellow)

7. DRL (yellow-brown)

8. Helmet compartment lighting (blue-black)

9. Powered by battery (Red-Blue)

10. Not connected

11. CAN L line (pink-white)

12. Mass (Black)

13. Heating switch on button (green)

14. Signal input indicator right side (red-gray)

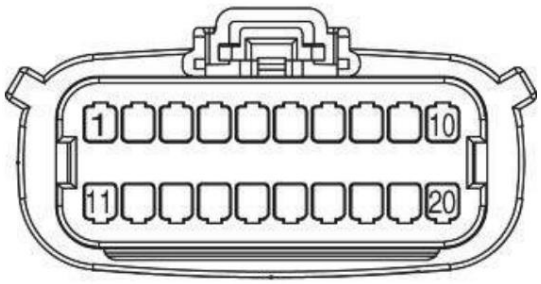
15. Signal output left turn signal (light blue)

16. Flasher unit (yellow)

17. Turn signal deactivation button (blue-white)

18. Seat opening adjustment device (yellow - gray)

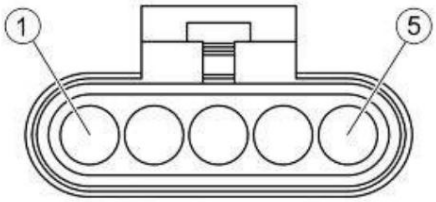
19. Mass (Black-Green)



20. Not connected

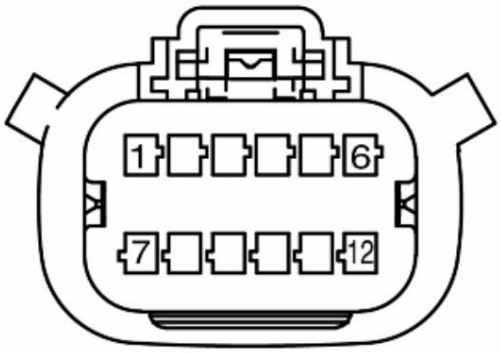
FUEL PUMP CABLE CONNECTOR

1. Not connected
2. Ground (Black)
3. Ground sensors (black-yellow)
4. Signal indicator light fuel indicator for In instrument unit (white-green)
5. Power supply via remote fuel relay pump (green)



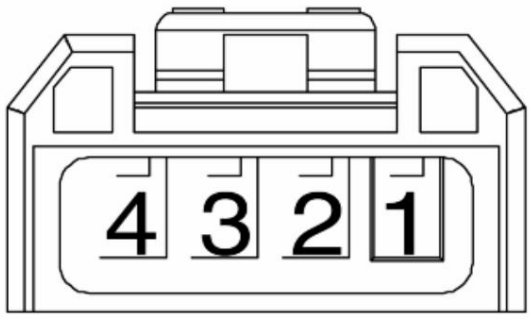
Preparation for anti-theft protection

1. Power supply battery (red-black)
2. Power supply via ignition lock (red - green)
3. Not connected
4. Alarm-LED (rot)
5. Right turn signal signal (white-blue)
6. Signal link Flashing (pink)
7. Ground (Black)
8. Helmet compartment lighting (blue - black)
9. Not connected
10. Not connected
11. Not connected
12. Not connected



PRE-EQUIPMENT FOR ELECTRICAL STORAGE COMPARTMENT

1. Power supply via ignition lock (brown Rot)
2. Signal keyless control electronics (light blue-yellow)
3. Ground (Black)
4. Powered by battery (Red-Blue)



CABLE CONNECTOR PREPARATION HANDLE

TONGUE/LEG WARMER/SEAT HEATER

1. Power supply via ignition lock (red - green)

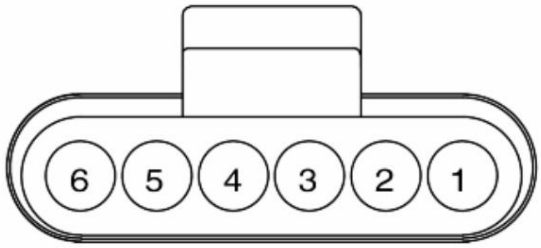
2. Ground (Black)

3. Powered by battery (Red-Black)

4. Preparation for heated bench (black-green)

5. CAN H line (Rosa-Rot)

6. CAN L line (pink-white)



CABLE CONNECTOR DIAGNOSTIC CONNECTOR

1. Power supply via ignition lock (red - green)

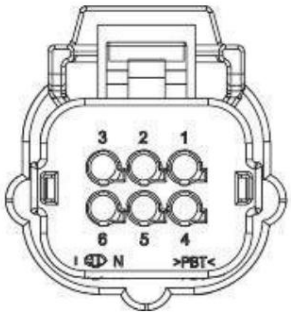
2. CAN H line (Rosa-Rot)

3. Ground (Black)

4. Powered by battery (pink-black)

5. CAN L line (pink-white)

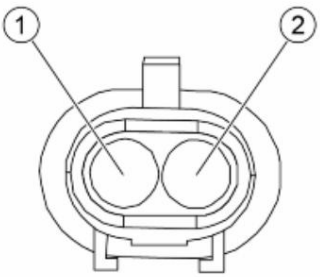
6. Line K (Orange - Black)



CABLE PLUG USB SOCKET

1. Power supply switched plus (red black)

2. Ground (Black)



HEADLIGHT CABLE CONNECTOR

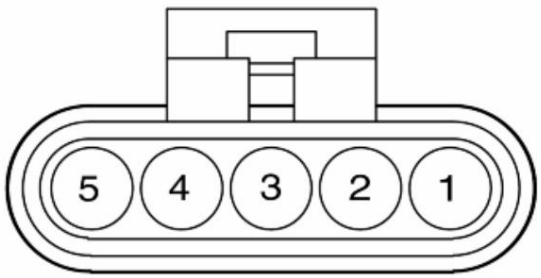
1. Daytime running lights (DRL) (yellow)

2. Parking light (light blue)

3. Ground (Black)

4. High beam (purple)

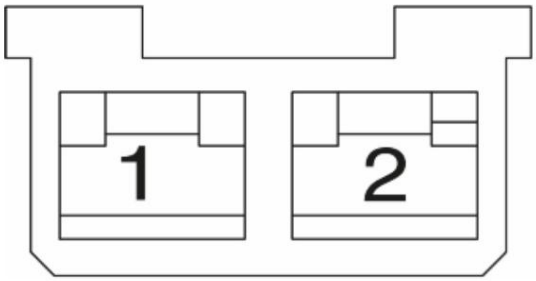
5. Low beam (brown)



CABLE CONNECTOR POWER BUTTON HOT ROOT

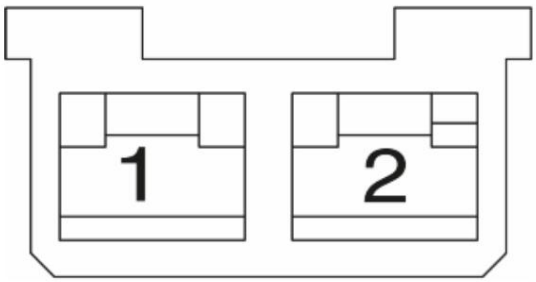
1. Ground of control electronics PMP3 (black green)

2. Signal PMP3 control electronics (green)



CABLE CONNECTOR SWITCH FOR SEAT OPENING

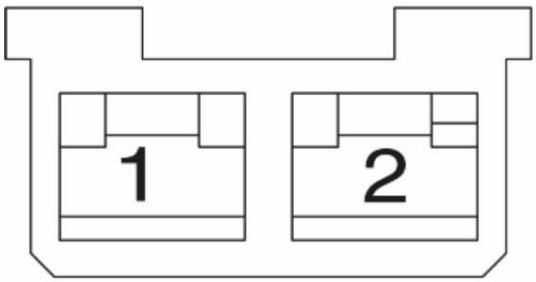
1. Signal seat opening for keyless (brown-yellow)
2. Mass (Brown - Black)



CABLE CONNECTOR BUTTON TANK OPENING

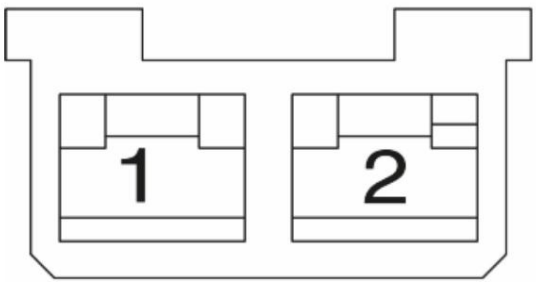
1. Signal tank opening button for keyless (brown red)

2. Mass (Brown - Black)



CABLE CONNECTOR BUTTON ASR

1. Signal (light blue-white)
2. Minus of injection control unit (gray-brown)



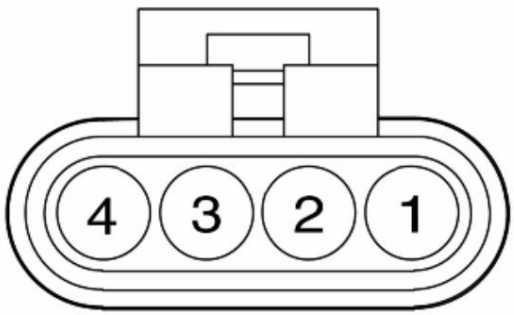
CABLE CONNECTOR BUTTON LIMIT SWITCH

1. Signal from the parking brake control electronics (braun)

2. Sensor ground (black-green)

3. Signal from parking brake control electronics (brown-white)

4. Sensor ground (black-green)

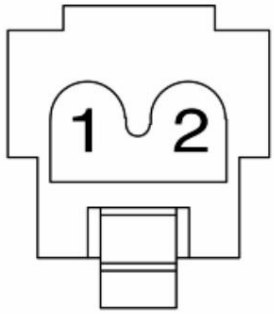


CABLE CONNECTOR PARKING BRAKE BUTTON

SE

1. Signal instrument unit (yellow-black)

2. Ground sensors (black-yellow)



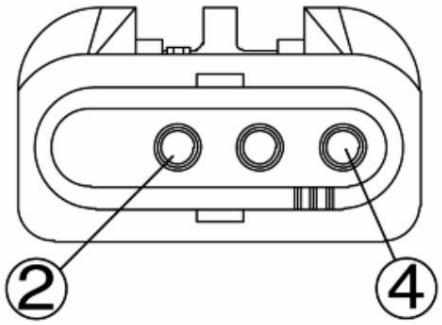
BRAKE LIGHT SWITCH CABLE CONNECTOR

BRAKE PEDAL

2. Ground sensors (gray-brown)

3. Signal injection control unit (white-gray)

4. Signal injection control unit (white-pink)



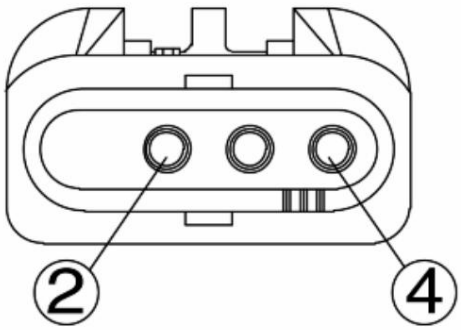
BRAKE LIGHT SWITCH CABLE CONNECTOR

RE

2. Ground sensors (black-yellow)

3. Injection control unit (white-gray)

4. Injection control unit (white-black)

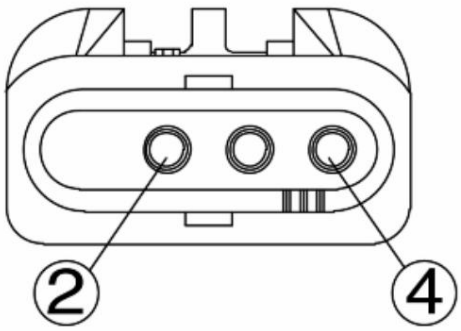


CABLE CONNECTOR BRAKE LIGHT SWITCH LH

2. Ground sensors (gray-green)

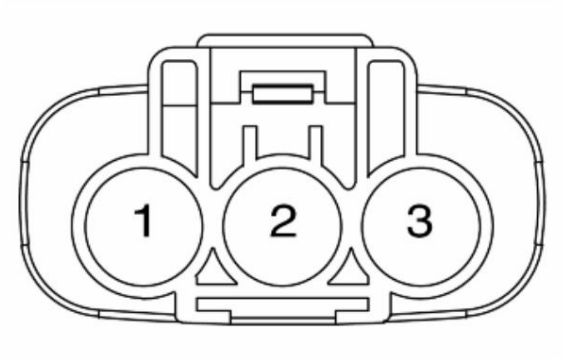
3. Injection control unit (pink-green)

4. Injection control unit (pink-brown)



CABLE CONNECTOR VOLTAGE REGULATOR

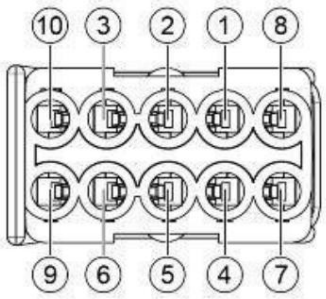
1. Battery plus (red-black)
2. Not connected
3. Ground (Black)



CABLE PLUG SELECTOR SWITCH FOR BE

DRIVE/REVERSE MODE

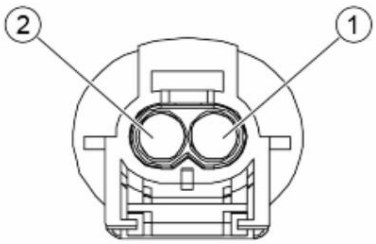
1. Injection control unit (light blue)
2. Mass (grey-green)
3. Injection control unit (gray-black)
4. Not connected
5. Not connected
6. Not connected
7. Not connected
8. Not connected
9. Not connected
10. Not connected



FRONT ABS SENSOR CABLE CONNECTOR

RIGHT

1. Minus of ABS control unit (purple-black)
2. Signal (lila-rot)



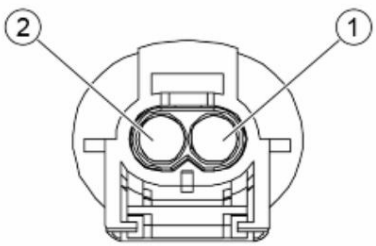
FRONT ABS SENSOR CABLE CONNECTOR

LINKS

1. Negative ABS control unit (light blue

Black)

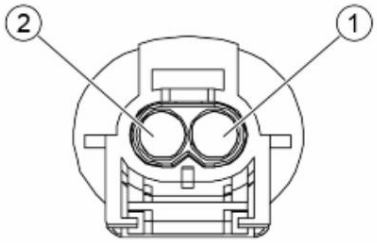
2nd signal (light blue-red)



REAR ABS SENSOR CABLE CONNECTOR

1. Minus of ABS control unit (brown-black)

2nd signal (brown-red)



CABLE CONNECTOR TILT SENSOR

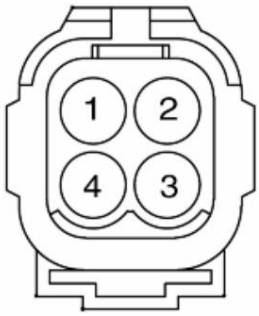
1. Not connected

2. Ground sensors (gray-green)

3. Supply via injection control unit (light

blue green)

4. Signal for injection control unit (orange-green)



CABLE CONNECTOR POSITION SENSOR GAS

HANDLE

1. Power supply (1) from injection control unit

(light blue-red)

2. Sensor ground (light blue-black)

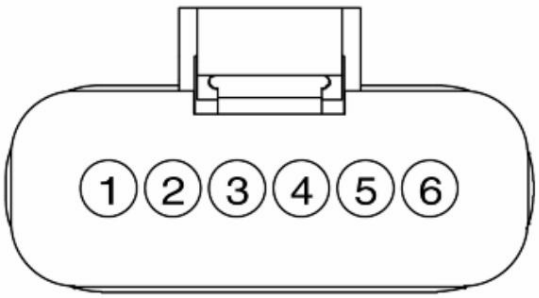
3. Signal (1) injection control unit (light blue-yellow)

4. Power supply (2) from injection control unit

(Brown-Red)

5. Sensor ground (brown-black)

6. Signal (2) injection control unit (brown-white)



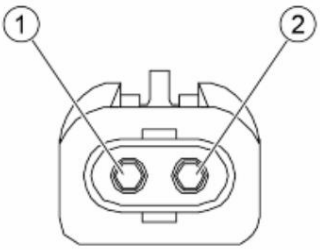
CABLE CONNECTOR DRIVER DETECTION SENSOR

SUNG

1. Driver detection signal (purple)

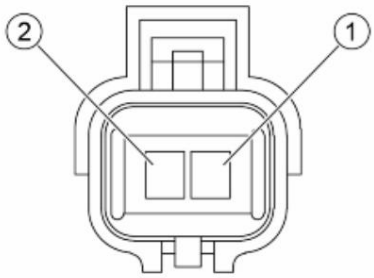
2. Minus of the parking brake control electronics

(black green)



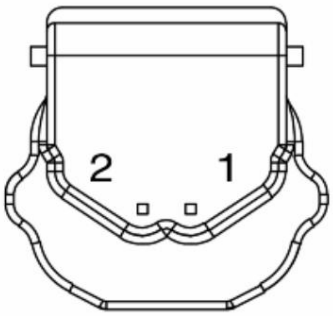
PRESSURE SENSOR CONNECTOR

1. Parking brake control electronics (white)
2. Sensor ground (black-green)



OIL PRESSURE SENSOR CABLE CONNECTOR

1. Instrument unit (Pink-Black)
2. Not connected



CONNECTOR ROTATION SENSOR

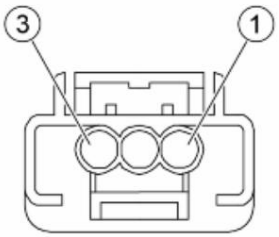
1. Power supply from locking control unit

brake (orange-blue)

2nd signal (green-blue)

3. Minus of parking brake control electronics

(black green)

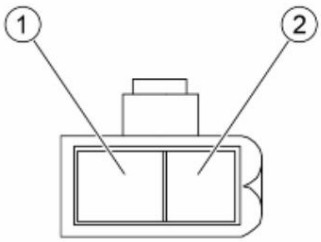


CABLE CONNECTOR OUTDOOR TEMPERATURE SENSORS

BEER

1. Ground (Black-Yellow)

2nd signal (yellow-blue)



ENGINE TEMPERATURE SENSOR CABLE CONNECTOR

BEER

1. Signal (light blue-green)
2. Not connected
3. Ground reference via injection control unit (Vio lett-black)
4. Not connected

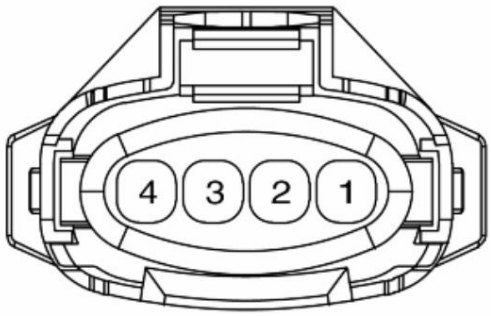
T-MAP SENSOR CABLE CONNECTOR

1. Ground reference via injection control electronics (gray-green)

2. Air temperature signal output for injection expensive device (yellow-blue)

3. Supply via injection control unit (green Rot)

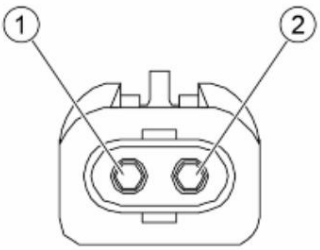
4. Air temperature signal output for injection expensive device (yellow-green)



CABLE CONNECTOR SPEED SENSOR

SOR RIGHT

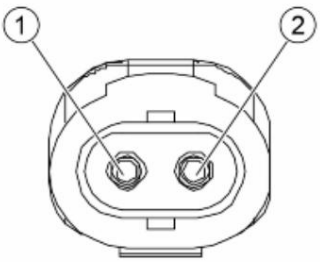
1. Minus of the parking brake control electronics (schwarz-rot)
2. Speed signal (red)



CABLE CONNECTOR SPEED SENSOR

SOR LINKS

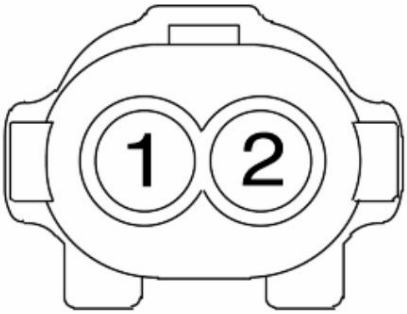
1. Minus of the parking brake control electronics (green-black)
2. Speed signal (Green)



CABLE CONNECTOR SOLENOID INTRODUCTION DIRECTION FOR IGNITION

1. Signal + solenoid actuator for ignition (green white)

2. Signal - Solenoid actuator for ignition (green-black)



CABLE PLUG LAMBDA SENSOR WITH HEATER CONTRAPTION

1. Lambda signal (+) from injection control electronics nik (green-blue)

2. Lambda signal (-) from injection control electronics (light blue-black)

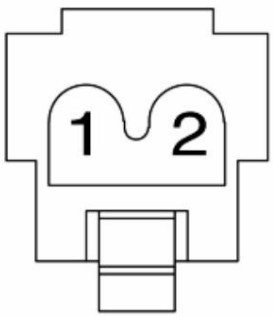
3. Power supply via remote injection relay dungs (black-green)

4. Ground from heater for injection control electronics ronik (white-blue)

CABLE PLUG BUZZER

1. Ground (Black)

2. Power supply from locking control unit brake (gray)



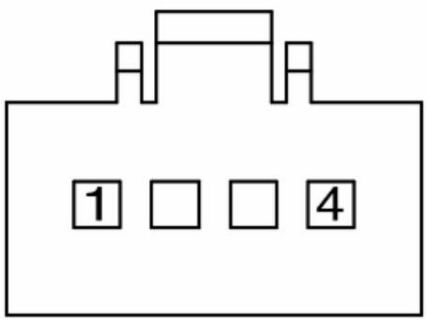
CABLE PLUG REAR CAMERA

1. Power supply via ignition lock (light blue)

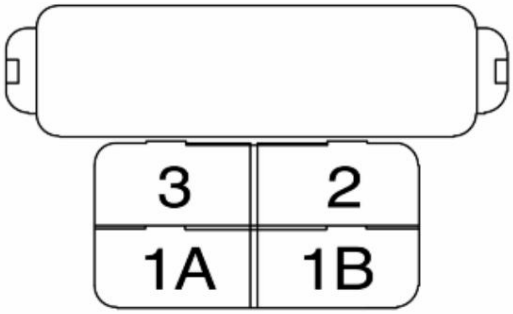
2. Ground (Black)

3. Signal Video (+) from Instrument Unit (Blue)

4. Signal video (-) from instrument unit (Oran ge-blue)



STARTER MOTOR REMOTE RELAY CABLE CONNECTOR



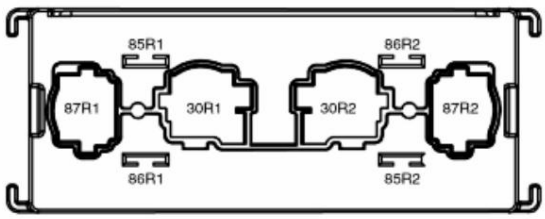
1A. Output power supply via battery (red Black)

1B. Output power supply via battery (red Black)

2. Input power supply via ignition lock for coil starter remote relay (orange-white)

3. Signal input for starter motor remote relay coil of injection control electronics (purple-white)

CABLE CONNECTOR REMOTE RELAY BACK GO FORWARD



30R1. Supply via relay for enabling the Reverse gear (red)

87R1. Output power supply via relay motor for reverse gear (red)

85R1. Signal from injection control unit for coil of the motor for reverse gear (white-purple)

86R1. Power supply via remote injection relay Charges (Black-Green)

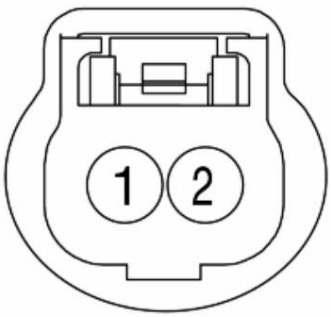
30R2. Output power supply via relay for Release of reverse gear (red)

87R2. Input power supply relay for enabling reverse gear (red)

85R2. Signal from injection control unit for coil for enabling reverse gear (blue)

86R2. Power supply via remote injection relay Charges (Black-Green)

ACTIVATED CHARCOAL VALVE CABLE CONNECTOR FILTERS



1. Signal for injection control unit (white-black)

2. Power supply via remote injection relay dungs (black-green)

Duplication of keys/remotes

Procedure for duplicating the remote control with "Piaggio KeyLess" system.

A= remote control

B= Master key

1. Checking the initial conditions:

1.1 Battery voltage over > 12V,

1.2 The master key must be available

1.3 All remote controls to be coded must be present (including those already available before process coded),

1.4 The PADS diagnostic instrument must be connected to the vehicle's OBD connector to do this, use the special tool.

Special tool

020922Y Diagnose-Instrument

021017Y Diagnostic cable EOBD E5

---

2. Start the duplication process before Up call the self-diagnosis Keyless

PADS:

2.1 Ignition key to **"OFF",**

2.2 The remote control by pressing the first and deactivate the second button.

2.3 Press the ignition lock and at the same time Master key (mechanical key). approach the keyless control unit. **(*)**

2.4 After the emergency indicators flash, the **Turn** the ignition key to “ON” (**).

(*) The master key is with an integ equipped with a transponder and must be on the contact between the back of the shield and the inner part be approximated at the top left, where the Keyless control unit is located.

(**) From the moment the selector switch is set to "ON", the process must be completed Programming the remote controls internally half of 120 seconds can be started (Be write in step 3. Otherwise the The process can be started from step 2.

3. Start procedure in Self Diagnosis > Pro

Programming the keyless remote controls

through PADS:

3.1 With ignition key set to "ON",

3.2 The self-diagnosis of the keyless control unit call,

3.3 Possible errors in memory in the "MEM" status eliminate, and/or resolve the problems continue,

3.4 Access the Settings section and the setting>programming remote control start according to the ge offered by PADS conducted procedure,

3.5 At the end of each remote control program PADS displays the message "Programming "successful" with the following message Programming a new remote control, ma maximum 4 remote controls **(***),

(***) The keyless control unit switches between programming a remote control and the other has 5 seconds of time available.

End of the remote control programming process.

TABLE OF CONTENTS

ENGINE FROM THE VEHICLE MOT DRIVE

This section describes the operations to be carried out to remove the engine from the vehicle.

Removal of complete exhaust

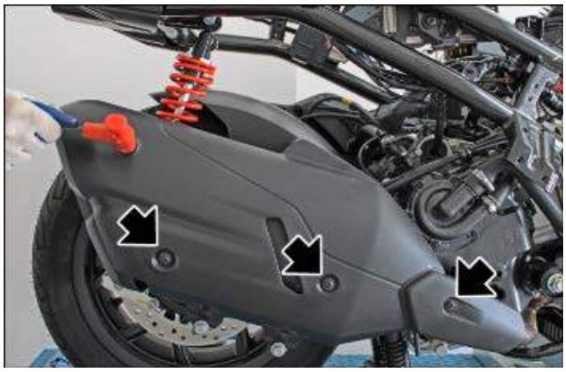
- Remove the right and left running boards.

- Unscrew the four fastening screws

and remove the heat protection.

ANNOTATION

It is NOT necessary to remove the running boards just to dismantle the end piece.

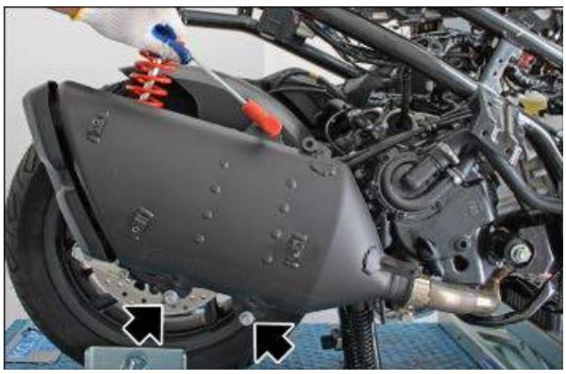


- The metal clamp between the exhaust tailpipe and

Loosen the manifold.

- The three exhaust mounting screws

Remove tailpipe.



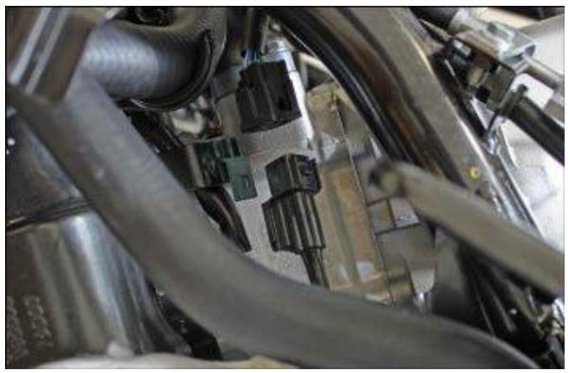
- Remove the exhaust pipe end piece by

pulls it off the manifold.

DANGER

IF ONLY REMOVING THE EXHAUST PIPE IS REQUIRED, ALWAYS A NEW GRAPHITE GASKET PLACE A BETWEEN THE PIPE PIECE AND THE END PIECE.

- Release the lambda sensor cable connector and cut him off.



DANGER

CLEAR THE LAMBDA SENSOR WIRING BEFORE REMOVAL OF THE EXHAUST. WILL BE THIS CABLING WITH TOO HIGH VOLTAGE CAN BE DAMAGED.

- The fixing screw of the pipe of the rear Unscrew the wheel brake from the frame.

- Remove the right nut of the exhaust flange.

- Remove the left nut of the exhaust flange.

ANNOTATION

To make the dismantling work easier, the Spark plug cables must be separated to provide greater freedom of movement.

- Remove the exhaust manifold while keeping it on top
Pay attention to the lambda sensor wiring harness
to pull out.

INSTALLATION OF COMPLETE EXHAUST

- If necessary, the lambda sensor on the exhaust
install manifold.

Torque guide values (N*m)

Fastening lambda probe 25 ± 5

- Install the exhaust manifold on the vehicle,
Pay attention to the lambda sensor when in
not to damage the installation.
-Screw on the two nuts of the exhaust flange
ben.

- Connect the lambda sensor cable connector
and attach it to the appropriate bracket.

- The rear brake tube back in position

bring and the appropriate fastening

Tighten screw on frame.

- Install the end piece on the exhaust manifold.

DANGER

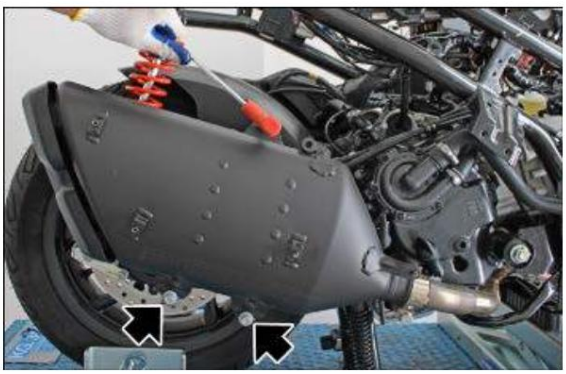
ALWAYS REPLACE THE GRAPHITE GASKET BETWEEN THE END PIECE AND THE EXHAUST MANIFOLD.

- Insert the three fastening screws and

Tighten with the specified torque.

Torque guide values (N*m)

Exhaust end part fastening screw 28.5 ± 1,5



- The two exhaust mounting nuts

flange with the specified torque

pull.

Torque guide values (N*m)

Fastening nut exhaust flange 17 ± 1

- The metal clamp between the exhaust tailpipe and Loosen the manifold.

Torque guide values (N*m)

Metal clamp 13 ± 1

- Install the heat protection on the exhaust pipe end animals and make sure that the pen is in the ent speaking rubber bushing on the end piece is set.

- The four fixing screws of the heat protection with the specified tightening torque pull.

Torque guide values (N*m)

Fastening screw heat protection 4.5 ± 0.5

TABLE OF CONTENTS

MOTOR	**AGAINST**

This section describes the work on the engine and the tools required for it.

Automatic drive

Gearbox cover

- Unscrew the 4 fastening screws.
- Remove the outer plastic drive cover.

- Use a screwdriver to open the cover

Remove the driven pulley axle.

- The special tool in the designated areas

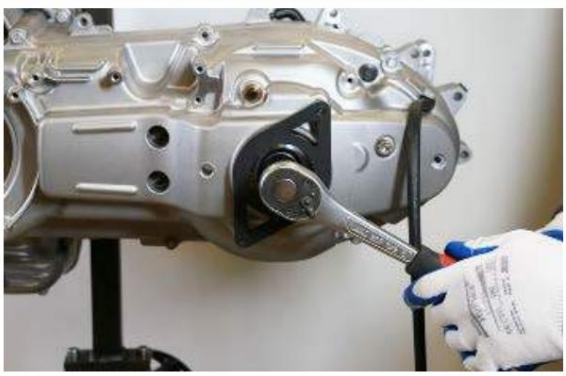
Install slots and the nut of the output

Unscrew the disc axle.

- Remove the nut and the two washers

distant.

- Remove the special tool.



Special tool

021022Y Stop guided pulley

- Remove the drive cover screws.

7 screws M6

- The screws on the right side of the lid

remove.

2 screws M8x70

Remove the screws on the middle part.

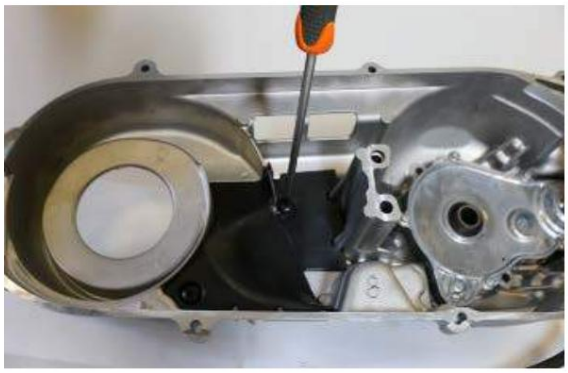
2 screws M8x100

- Remove the drive cover.

- Check whether the bearing rotates freely. Otherwise must

it needs to be replaced.

Air baffle



- Remove the drive cover.

- Unscrew the two fixing screws shown in the illustration and remove the air baffle

mount.

Torque guide values (N*m)

Air baffle screws 7.0 ± 1.0 Nm

Removing the shaft bearing of the guided pulley

- Remove the drive cover.

- Remove the seeger ring.

- The drive cover with a wooden plate and the

Support special tools.

- Remove the bearing using the special tool.

ANNOTATION

THE BASKET MUST BE PLACED UNDER THE INSIDE OF THE LID NEAR THE BEARING SEAT AND THE WOODEN SUPPORT BECAUSE WITHOUT THE BASKET THERE IS A RISK THAT THE ENTIRE COVER STRUCTURE WILL BEND, NOT JUST IN THE STIFFER AREA. NOT ONLY IN THE STIFFER AREAS.

Special tool

001467Y002 Basket for bearings with external diameter Ø 73 mm

020376Y Handle for adapter

020375Y Adapter 28 x 30 mm

020439Y Guide 17 mm

Installation of shaft bearing guided pulley

- The inside of the drive cover with a

Heat the heat gun.

ANNOTATION

TO AVOID DAMAGE THE PAINTED EXTERNAL SURFACE, MAKE SURE NOT TO HEAT THE LID TOO HOT.

Special tool

020151Y hot air gun

- Place the bearing on the special tool

and attach with a little fat.

- Insert the new bearing with the special tool

build.

ANNOTATION

**TO NOT DAMAGE THE PAINT SURFACE,
PLACE THE LID ON A SUITABLE SURFACE.**

Special tool

020376Y Handle for adapter

020358Y Adapter 37 x40 mm

020439Y Guide 17 mm

Removal of guided pulley

- Remove the clutch basket, if necessary with one

screwdriver and a plastic mallet.

- Remove the fixed drive belt half pulley

in.

- The assembly guided pulley together

pull it off with the belt.

Check clutch basket

- Check that the clutch basket is not worn or otherwise damaged.
- The inner diameter of the clutch basket measure.

ANNOTATION

THE MEASURED ECCENTRICITY MUST NOT BE MORE THAN MAXIMUM 0.2 MM.

Technical specifications

Permissible limit:

160,5 mm

Default value:

160,2 mm

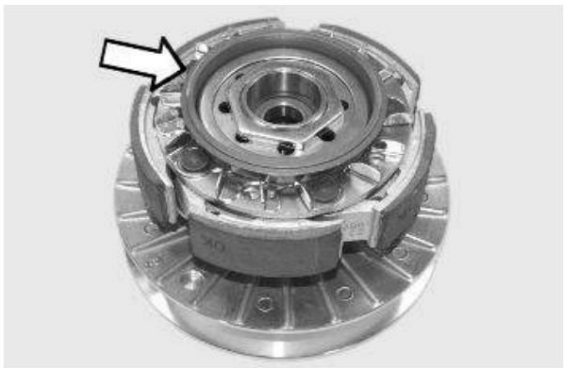
Dismantling the clutch

- To remove the entire clutch from the the guided pulley must be the special work stuff can be used.
- The special tool with the in position **«E»** of medium-length pin attached to the inside equip.

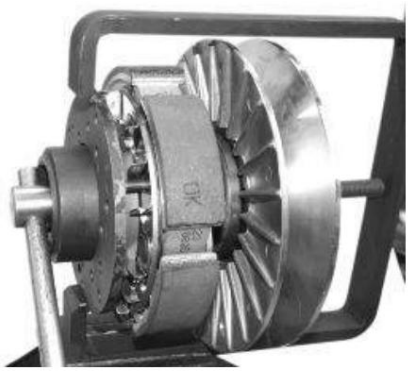
Special tool

020444Y Tool for attaching and removing the Clutch on the guided pulley

- Attach the adapter ring as shown in the picture Insert the clutch unit.



- The assembly guided pulley on
Attach special tool. They have to
Pins inserted into the ventilation holes
the.
- Tighten the rear fixing screw as shown in the
figure until it stops
Attach the guided pulley.



DANGER

**THE TOOL MUST BE FIXED WITH THE APPROPRIATE EXTENSION
VICE CAN BE USED. IN ORDER TO NOT CAUSE PERMANENT DEFORMATION
TO CAUSE TOOL, THE REAR MOUNTING SCREW MUST NOT TIGHTEN
BE TIGHTENED.
- REMOVE THE FASTENING THREADED RING WITH THE APPROPRIATE 55MM WRENCH.**

**- UNSCREW THE SCREW ON THE TOOL AND DISASSEMBLE THE GUIDED BELT PULLEY,
CLUTCH AND SPRING ASSEMBLY WITH PROTECTIVE COVER.**

Checking the clutch

- Measure the thickness of the abrasive material on the coupling masses.

Technical specifications

Smallest permissible thickness:

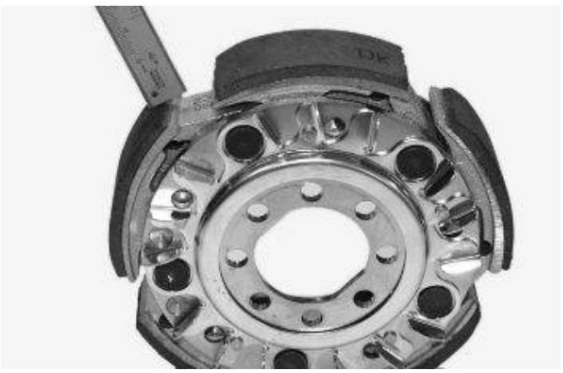
1 mm

- The masses must not show any traces of lubricant. Otherwise the assembly seals
Check guided pulley.

ANNOTATION

DURING THE RUN-IN PERIOD THE COUPLING MASSES MUST HAVE CENTRAL CONTACT SURFACES. THEY MUST ALL BE THE SAME. DIFFERENT CONDITIONS WILL CAUSE THE CLUTCH TO TEAR.

- Do not open the clutch masses with tools in
order to change the spring tension
To avoid return spring.



Tenon collar ring

- Remove the collar using 2 screwdrivers

pull it off.

- Remove the 4 guide pins.

- Pull off the movable belt half pulley.

Control fixed guided belt half pulley

- The contact surface with the belt on ver

check wear.

- The outside diameter of the pulleys

measure socket.

Technical specifications

Smallest permissible diameter:

49,91 mm

Standard diameter:

50,00 -0,015 -0,035 mm

Removal of bearing guided belt half pulley

- Check the bushing for signs of wear and damage.
If necessary, replace the fixed guided belt half pulley.
- Remove the locking ring using a suitable one Remove pliers.

- With the attached in the roller bearing Remove the ball bearing using a special tool to drive.

ANNOTATION

IN ORDER TO NOT DAMAGE THE THREAD, THE BELT PULLEY MUST BE PLACED ON A SUITABLE SURFACE.

Special tool

020376Y Handle for adapter

020456Y Adapter Ø 24 mm

020363Y Guide 20 mm

ANNOTATION

IF THE BEARING REVISION IS CARRIED OUT WITH A GUIDED PULLEY ASSEMBLY INSTALLED, THE ASSEMBLY MUST BE SUPPORTED WITH THE BASKET.

Special tool

001467Y002 Basket for bearings with outer diameter Ø 73 mm

- The roller bearing with the specified special remove tool. The straps must be there
Half disc can be supported with the basket.

Special tool

020376Y Handle for adapter

020375Y Adapter 28 x 30 mm

020364Y Guide 25 mm

001467Y002 Basket for bearings with external diameter Ø 73 mm

Control movable guided belt half pulley

- The contact surface with the belt on ver

check wear.

- Remove the 2 inner sealing rings and the 2 outer

O-rings.

- The inner diameter of the bushing of the movable

Measure the belt half pulley.

Technical specifications

Maximum permissible diameter:

50,05 mm

Standard diameter:

50,00 +0,035 0,00 mm

Installation of bearing guided belt half pulley

- Install a new roller bearing using the specified special tool.

ANNOTATION

INSTALL BEARING WITH LABEL AND OIL SEAL INSTALLED SO THAT THEY FACE OUTSIDE.

- In order not to damage the thread, the pulley must be placed on a suitable surface

be placed.

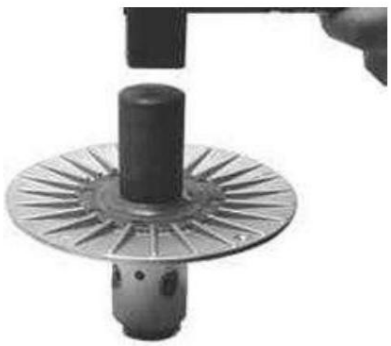
When working with the assembled assembly of the guided pulley, the spe

target tool can be used.

Special tool

020478Y Punch mandrel for needle sleeve

001467Y002 Basket for bearings with external diameter Ø 73 mm



- Install a new ball bearing using the specified special tool.

Special tool

020376Y Handle for adapter

020477Y Adapter 37 mm

020363Y Guide 20 mm

- Insert the circlip.

Assembling the guided pulley

- Insert the new shaft seals.
- Insert the new O-rings.

ANNOTATION

THE TWO O-RINGS ARE DIFFERENT SIZES. THE LARGE O-RING IS PLACED ON THE CIRCUMFERENCE OF THE WORKING END ON THE BASE OF THE BELT HALF-PULLEY.

- Place the belt half pulley onto the bushing

Zen. Be sure to make sure that the above right sealing ring is not damaged.

- Check the pins and collar ring for wear check and install.

Using a curved nozzle grease gun, grease the guided pulley assembly with approximately 10g grease. The grease is inserted into the inside of the bushing through one of the holes until it begins to emerge on the opposite side. This step is necessary to ensure that no grease gets behind the O-rings.

Recommended products

Lubricating grease with molybdenum disulfide Lithium grease with the consistency of a paste, contains molybdenum disulfide.

Grey-black grease

Check the compression spring

The free length of the compression spring between the clutch and the guided pulley half mes its.

Technical specifications

Standard length:

146,5 mm

Maximum permissible length according to use:

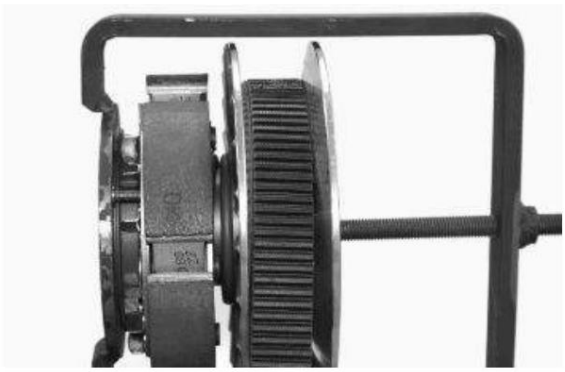
137,0 mm

Installation of the clutch

- The special tool as used for removal Equip additional parts.

- The assembly guided pulley together temporarily assemble the men with the belt.
Pay attention to the running direction of the belt.

- The assembly guided pulley, the spring with protective cover and the clutch in the factory use stuff.



Special tool

020444Y Tool for attaching and removing the Clutch on the guided pulley

- Compress the spring and insert the coupling into the bushing of the guided pulley was

ANNOTATION

MAKE SURE THAT THE PROTECTIVE COVER AND THE THREADED PART OF THE SOCKET TO BE DAMAGED.

- Tighten and tighten the threaded ring manually closing with the specified special work with the specified torque tighten.

Special tool

020444Y Tool for attaching and removing the Clutch on the guided pulley

Torque guide values (N*m)

Threaded ring coupling 65 - 75

- To facilitate installation on the engine, turn the guided movable pulley and the

Insert the belt at the smallest diameter.

Installation guided pulley

- The assembly guided pulley together

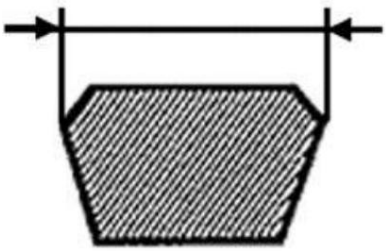
Insert the men with the belt.

drive belt

- Check that the drive belt is not damaged

is right.

- Measure the belt width.



Technical specifications

Minimum width

27,5 mm

Total width

28,7 mm

Removing the drive pulley

- Assemble the special tool by

first attach the two retaining straps to the strap

disc attaches so that the notch is complete

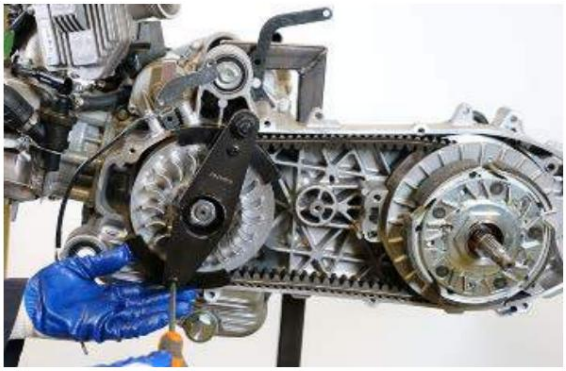
rests.

Special tool

020474Y Key to block the on
drive pulley

- The 2 fastening screws can also be tightened by hand

screw the main tool.



- Use a 27 mm wrench to tighten the center

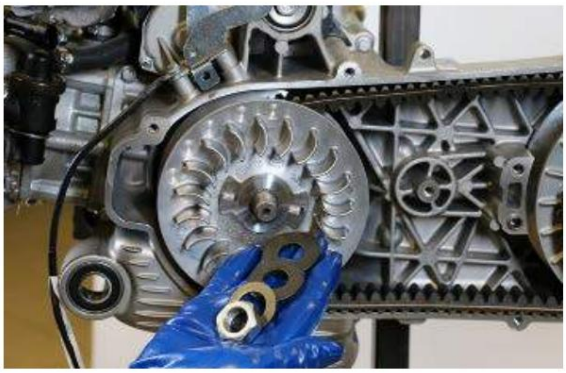
Unscrew the drive belt pulley nut

ben.

- Remove the washers.

- Remove the fixed drive belt half pulley

in.



- The assembly guided pulley together

pull it off with the belt.

- Remove the connecting washer to the socket

with.

- The mobile drive belt half pulley with the

Pull out the associated socket while doing so make sure that the rollers do not fall out.

- Pull out the rear washer.

- The drive side housing is now free

Check roll container

- Check that the internal bearing bushes do not show excessive wear. The inside measure diameter.

DANGER

- DO NOT LUBRICATE OR CLEAN THE BEARING BUSHINGS.

Technical specifications

Maximum permissible diameter:

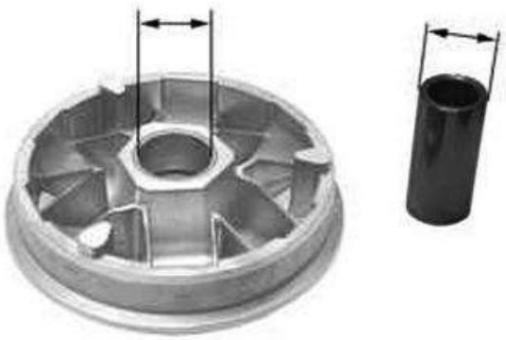
30,12 mm

Standard diameter:

30,021 mm

- The outside diameter of the pulleys

Measure the liner as shown in the figure.



Technical specifications

Smallest permissible diameter:

Ø 29,95 mm

Standard diameter:

Ø 29,959 mm

- Check that the rollers are not damaged or worn.

Technical specifications

Smallest permissible diameter:

Ø 24,5 mm

Standard diameter:

Ø 24,9 mm

- Put the running shoes on the roller stop plate

Check wear.

- The wear condition of the grooves (roller seats) and the belt treads on both belts

Check half washers.

Install drive pulley

Installation of roller containers

- Insert the spacer with the inner bevel in the installation direction.

- Check that the running shoes fit the rollers striking plate are not worn.
- The wear condition of the grooves (roller seats) and the belt treads on both belts

Check half washers.

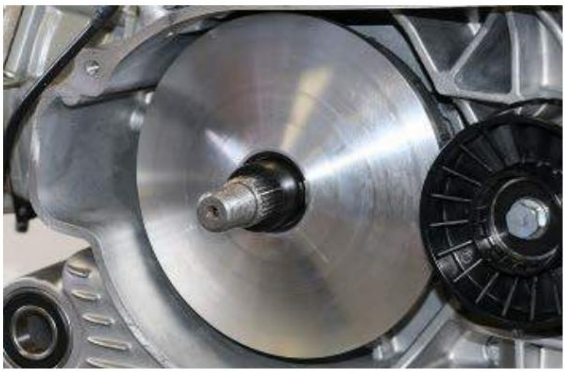
- The rollers as shown in the picture

Attach half washer.

- The closed side must be on the inside rest on the pressure side of the roll container.

- The belt half pulley with roller stop and running shoes.

- The bushing and drive belt half pulley insert.



- Place the drive belt on the guided belt

mount the disc.

Installation of fixed drive belt half pulley

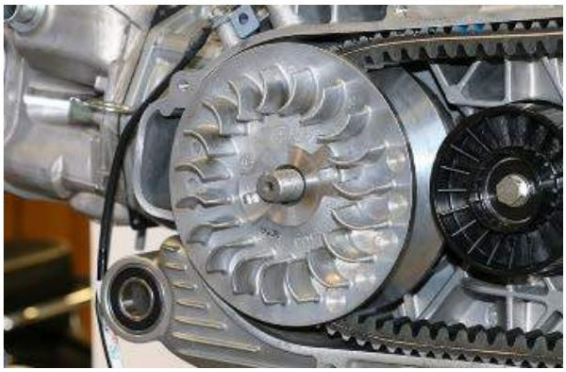
- Insert the spacer.

- Insert the fixed drive belt half pulley

and check that they have the spacer and

the liner of the movable drive belt

half disk touches.



- The flat washer and the plate washer

Attach as shown in the picture.

- The nut in the same installation position as attach beforehand (mother side contact Tel disk).

- Assemble the special tool by first attach the two retaining straps to the strap disc attaches so that the notch is complete rests.
- The 2 fastening screws can also be tightened by hand screw the main tool.

Special tool

020474Y Key to block the on drive pulley

- Fasten with a 27mm wrench Drive pulley nut with the specified one Tighten the specified torque.
- Remove the special tool.

Torque guide values (N*m)

Nut drive pulley 160 - 175

Installing the gearbox cover

- Put on the drive cover.

DANGER

WARNING

THE FOUR M8 SCREWS OF THE DRIVE COVER HAVE DIFFERENT LENGTHS: THE TWO LONG SCREWS ARE MOUNTED IN THE MIDDLE PART, THE TWO SHORT SCREWS IN THE RIGHT PART.

- Tighten the screws on the middle part.

2 screws M8x100

Torque guide values (N*m)

Fasteners M8 drive cover 23 ÷ 26 Nm (17 ÷ 19 lb*ft)

- Tighten the screws on the right part.

2 screws M8x70

Torque guide values (N*m)

Fasteners M8 drive cover 23 ÷ 26 Nm (17 ÷ 19 lb*ft)

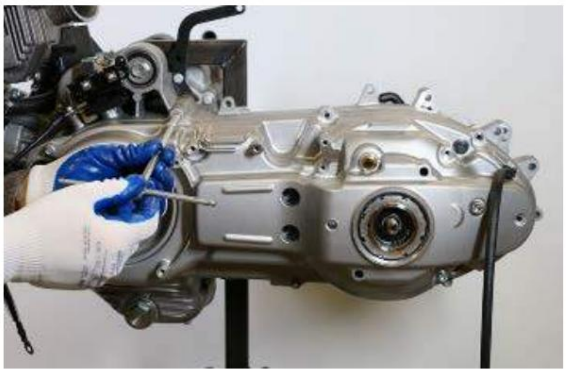
- Screw on the drive cover screws

ben.

7 screws M6

Torque guide values (N*m)

Fasteners M6 drive cover 11 ÷ 13 Nm (8 ÷ 10 lb*ft)



- The washers on the shaft of the guided

Put on the th belt pulley.

ANNOTATION

FIRST PUT ON THE WASHER WITH THE SMALLER OUTER DIAMETER AND THEN THE LARGER ONE.

- Place the special tool in the designated areas

Insert slots, rotate the shaft if necessary,

to be able to fully introduce it.

Special tool

021022Y Stop guided pulley

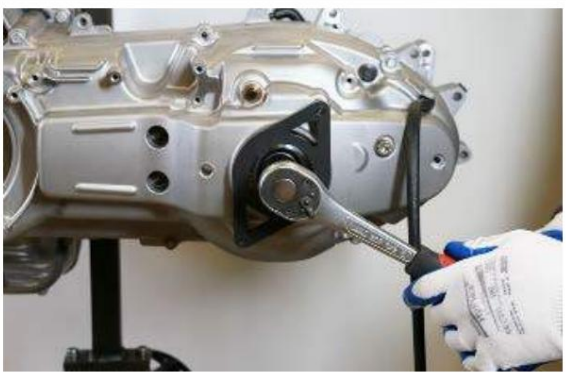
- Install the driven pulley axle nut.

- The mother with the prescribed suit

tighten moment.

Torque guide values (N*m)

Nut guided pulley 92 ÷ 100 Nm (68 ÷ 74 lb*ft)



- Remove the special tool.

- Install the drive pulley axle lock

animals.

ANNOTATION

CHECK THAT THE AIR INLET AND AIR OUTLETS ARE COMPLETELY CLEAR.

- Put on the outer plastic drive cover.

- The 4 fastening screws with the indicated

tighten to the desired torque.

Torque guide values (N*m)

Noise protection cover - drive cover 7.0 ± 1.0 Nm

Rear wheel transmission

Removing the rear wheel gear cover

- The rear wheel gear oil through the drain screw be drained at the bottom of the engine.

- The hub cover fastening screws remove.

4 long screws

3 short screws

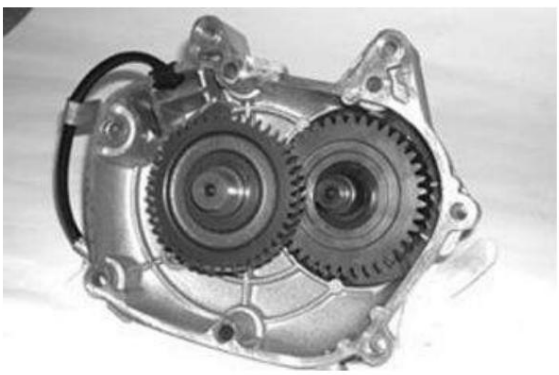
ANNOTATION

THE FASTENING SCREWS ARE DIFFERENT IN LONG. DO NOT CERTAIN YOUR RESPECTIVE INSTALLATION POSITIONS.

- The hub cover together with the associated remove the seal.

Removing the rear wheel axle

- Remove the countershaft.
- Remove the wheel axle complete with gear.



Removing rear wheel gearbox bearing housing

- The condition of all bearings (wear, play and

Check noise development).

If errors are found, proceed as follows.

The following tools are required to remove the wheel axle

bearing from the housing of the rear wheel transmission.

Special tool

001467Y014 Pliers for removing bearings Ø 15 mm

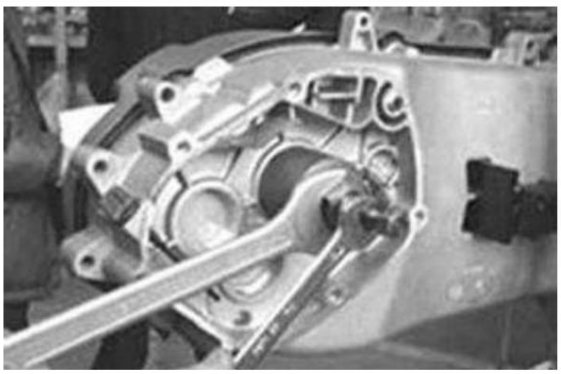
001467Y031 Pliers for removing bearings with Ø 15 mm

001467Y031 Korb

- To remove the countershaft bearing

The motor housing must have the corresponding off

pulling device can be used.



Special tool

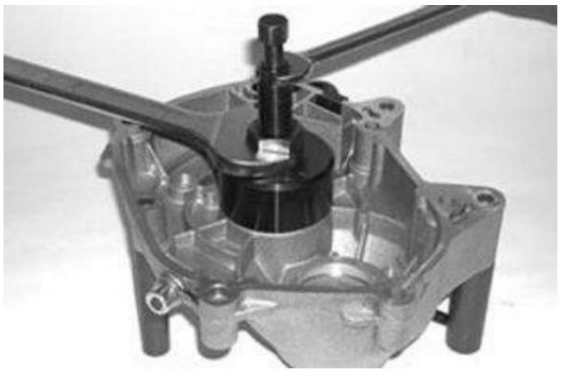
001467Y006 Pliers for removing bearings with 20 mm

001467Y035 Basket for bearings with external diameter Ø 47 mm

- The rear gearbox cover with the columns

support sentence.

- Remove the bearing using the special tool.



Special tool

020476Y screw bolt

001467Y006 Pliers for removing bearings with 20 mm

001467Y007 Basket for bearings with external diameter Ø 54 mm

Wheel axle bearing removal

- The circlip from the outside of the lid remove.

- The rear gearbox cover with the columns support sentence.

- Remove the bearing using the special tool.

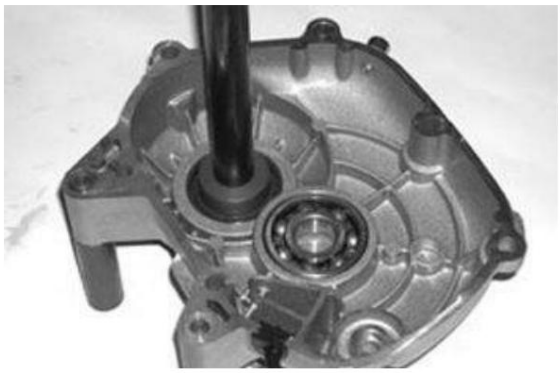
Special tool

020476Y screw bolt

020376Y Handle for adapter

020477Y Adapter 37 mm

020483Y Guide (30 mm)

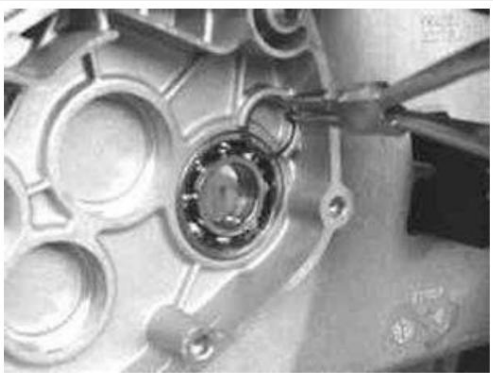


- Remove the shaft seal with a screwdriver remove.

Removing the shaft bearing of the guided pulley

- Must the shaft of the guided pulley, the corresponding bearing and the shaft seal To be removed, the drive must first be removed cover and the clutch unit as in chapter “Automatic transmission” described who removed it the.

- The shaft of the guided pulley from the Pull bearing.



- Remove the shaft seal with a screwdriver from inside the rear wheel housing expand the drive.

- Remove the circlip shown in the illustration distant.

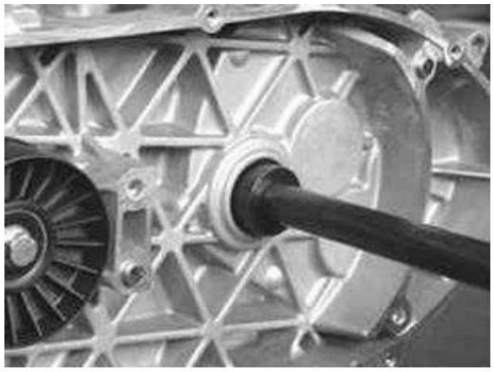
- Using the specified special tool, la ger of the shaft of the guided pulley Remove the motor housing.

Special tool

020376Y Handle for adapter

020358Y Adapter 37 x40 mm

020364Y Guide 25 mm



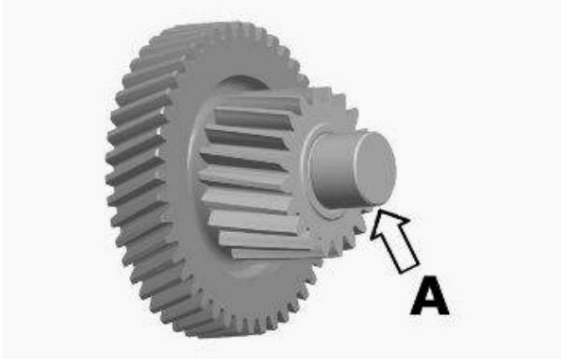
Checking the rear gear shafts

- Check that the 3 waves are on the tooth surface chen, the bearing surfaces and the shaft seal rings are not worn or deformed.
- If abnormalities are detected, the be Replace damaged components.

Technical specifications

Countershaft running surface diameter:

A = Ø 20 - 0,01 -0,02 mm

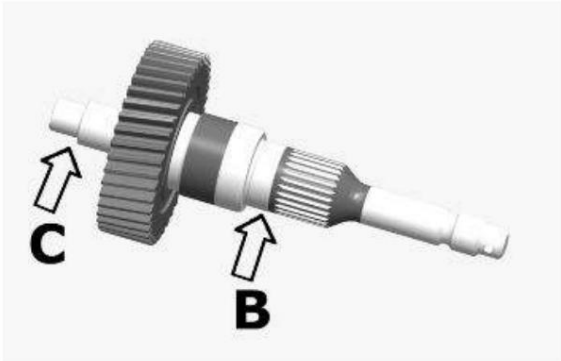


Technical specifications

Wheel axle tread diameter:

B = Ø 30 - 0,010 -0,023 mm

C = Ø 15 - 0,01 -0,02 mm



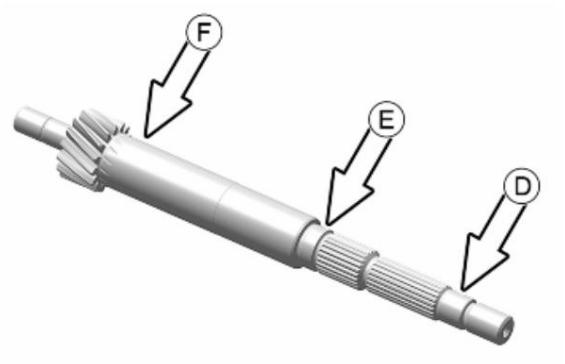
Technical specifications

Diameter of running surface of shaft guided pulley:

D = Ø 15 - 0.01 -0.02 mm

E = Ø 20 - 0.01 -0.02 mm

F = Ø 25 - 0,01 -0,02 mm



Checking the rear gearbox cover

- Check that the mating surfaces are not scratched or warped.

- Check the bearing surfaces.

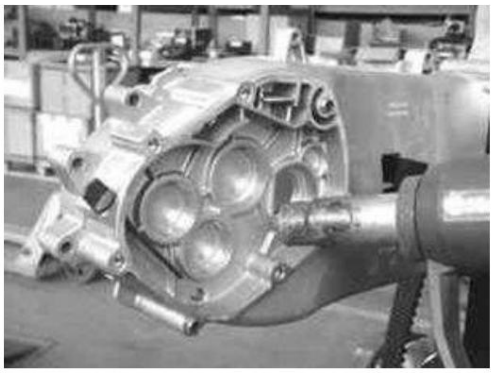
If damage is found, the rear gearbox cover must be replaced.

Installing the shaft bearing of the guided pulley

- Heat the housing with the heat gun.

Special tool

020151Y hot air gun



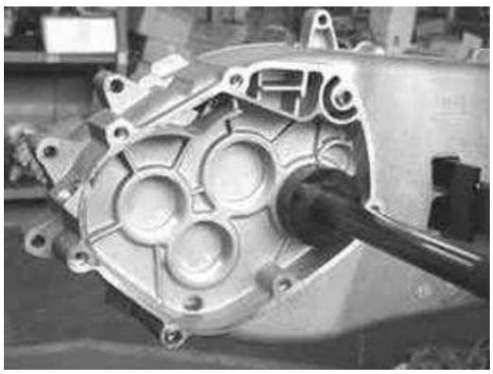
- Remove the bearing of the shaft of the guided pulley

using the specified special tool

Insert it into its seat until it stops.

ANNOTATION

THE BALLS MUST BE VISIBLE FROM THE REAR GEAR (THIS REQUIREMENT APPLIES TO ALL BEARINGS WITH PLASTIC CONTAINERS).



Special tool

020376Y Handle for adapter

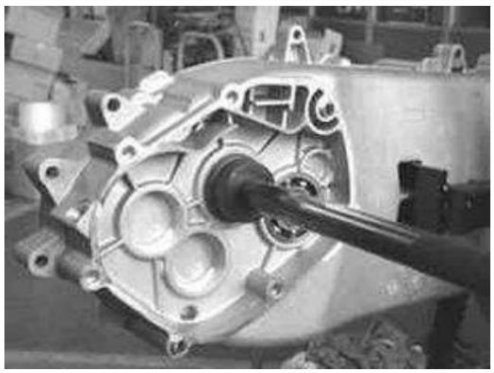
020360Y Adapter 52 x 55 mm

020364Y Guide 25 mm

- Heat the countershaft bearing seat.

- The bearing of the countershaft with the specified

Use the specified special tool.



ANNOTATION

THE BALLS MUST BE VISIBLE FROM THE REAR GEAR (THIS REQUIREMENT APPLIES TO ALL BEARINGS WITH PLASTIC CONTAINERS).

Special tool

020376Y Handle for adapter

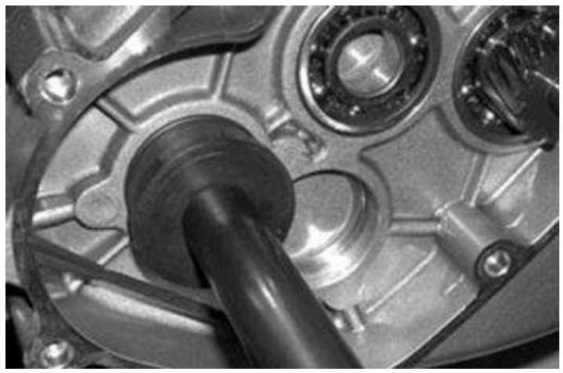
020359Y Adapter 42 x 47 mm

020363Y Guide 20 mm

- The bearing seat of the wheel axle bearing on the housing heat.

- Remove the wheel axle bearing with the special tool

Insert the upper seat on the housing.



ANNOTATION

THE BALLS MUST BE VISIBLE FROM THE REAR GEAR (THIS REQUIREMENT APPLIES TO ALL BEARINGS WITH PLASTIC CONTAINERS).

Special tool

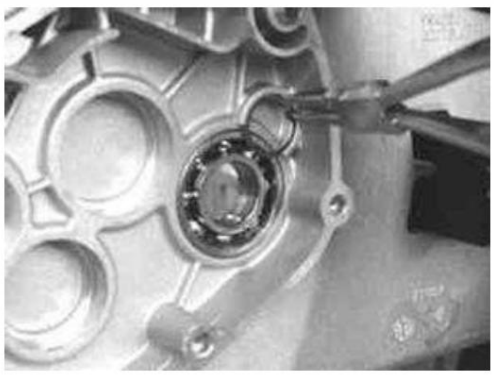
020376Y Handle for adapter

020359Y Adapter 42 x 47 mm

020412Y Guide 15 mm

- Install the circlip of the bearing of the guided

pulley shaft.

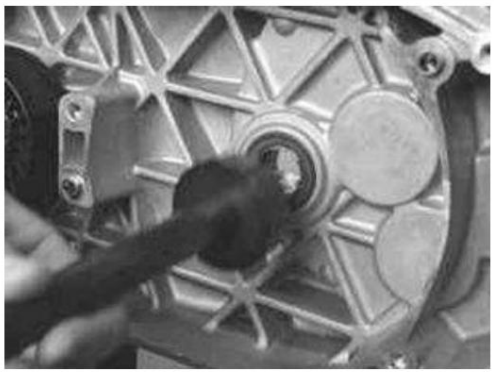


ANNOTATION

NOTE THE INSTALLATION POSITION SHOWN IN THE ILLUSTRATION.

- The shaft seal of the guided belt pulley

Insert it from the drive side.



Installing the bearings in the rear gearbox cover

- The bearing seats on the rear wheel gear cover

Heat with a heat gun.

- The rear gearbox cover with the columns

support sentence.

Special tool

020151Y hot air gun

020476Y screw bolt

- The bearing of the countershaft with the specified

Use a special tool in the rear wheel gear

insert cover.

ANNOTATION

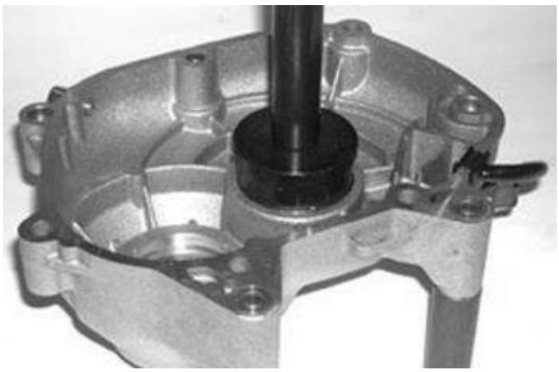
THE BALLS MUST EXIT FROM THE REAR WHEEL GEAR BE VISIBLE (THIS REQUIREMENT APPLIES TO ALL WAREHOUSES WITH PLASTIC CONTAINERS).

Special tool

020376Y Handle for adapter

020360Y Adapter 52 x 55 mm

020363Y Guide 20 mm



- The bearing seat of the wheel axle bearing from the Au

Heat the outside of the rear wheel gear cover.

- The wheel axle bearing with a suitable blow

mandrel into the rear wheel gear as far as it will go

insert cover.

Special tool

020376Y Handle for adapter

020360Y Adapter 52 x 55 mm

020483Y Guide (30mm)

- Install the snap ring.

- The rear gearbox cover with the columns support sentence.

- The shaft seal of the wheel axle with the sealing lip towards the inside of the rear wheel gear Install cover.

- Allow the shaft seal to be flush with the rear wheel gear cover.

Special tool

020376Y Handle for adapter

020360Y Adapter 52 x 55 mm

020476Y screw bolt

Installation of rear wheel gears

- Attach the 3 shafts as shown in the picture bring.

Installing the rear gearbox cover

- Correct attachment of the centering pins check.

- Install a new gasket.

- Install the cover. Pay attention to the correct positioning of the ventilation line.

- The fastening screws according to the

Use the position noted when dismantling.

4 long screws

3 short screws

- The screws with the specified rotation

Tighten momentarily and adjust to position

the retaining clamps of the ventilation line

pay attention as shown in the figure.

Torque guide values (N*m)

Screws cover rear wheel gearbox. 24÷27

- The rear gear oil drain plug

insert and with the prescribed rotation

tighten moment.

- The rear wheel transmission up to its maximum level

Fill with the specified oil.

Suggested products

Gear oil 80W-90 lubricant for gears and drives.

SAE 80W-90; API GL-4

Torque guide values (N*m)

Rear gearbox oil drain plug15 ÷ 17 (11 ÷ 12.5 lb*ft)

Alternator cover

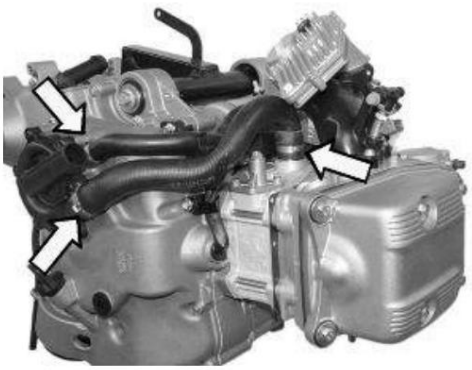
- To make the alternator cover easier to remove

To be able to build, you need the 4 in the picture

hose clamps shown removed and the Muf

fe of the supply line on the cylinder and the return line

removed from the pump cover.



ANNOTATION

THE CLAMPS NEED TO BE REPLACED.
THEY CAN BE OPENED WITH A SCREWDRIVER OR CUT THROUGH FOR REMOVAL.
MAKE SURE THAT THE PLASTIC CONNECTIONS ARE NOT DAMAGED.

Removing the alternator cover

- Drain the engine oil via the oil drain plug

its.

- A suitable container to collect the

Place the engine oil under the drain plug.

- Remove the pre-filter.

- The filter with a suitable filter band

Remove key or filter key.

- The 13 mounting screws of the alternator

Unscrew the lid, paying attention to the various parts

which lengths pay attention to:

1 medium screw 75 mm

9 medium length screws 40 mm

3 short screws 31 mm

ANNOTATION

THE FASTENING SCREWS ARE DIFFERENT IN LONG. DO NOT CERTAIN YOUR RESPECTIVE INSTALLATION POSITIONS.

- The alternator cover together with the

associated seal and the holder for the

Remove the cooling system sleeves.

DANGER

KEEP IT ON WHEN REMOVAL OF THE ALTERNATOR COVER MAKE SURE THAT THE STATOR AND THE ROTOR DO NOT JUMP.

DANGER

BE CAREFUL THAT THE SMALL BY PASS LINE VALVE AND ASSOCIATED SPRING DO NOT FALL OUT.

Dismantling the alternator cover components

- Unscrew the fixing screws and

remove the water pump cover.

6 Torx screws T25

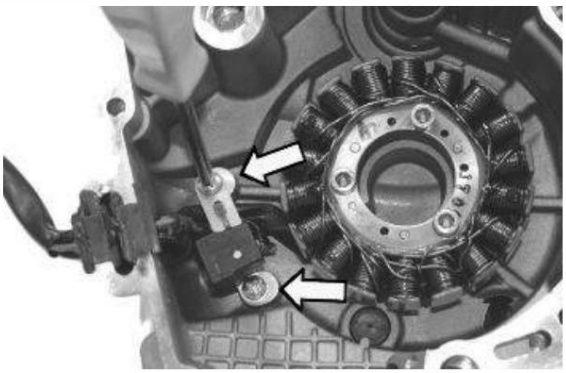
- Remove the by-pass and the associated spring

with.

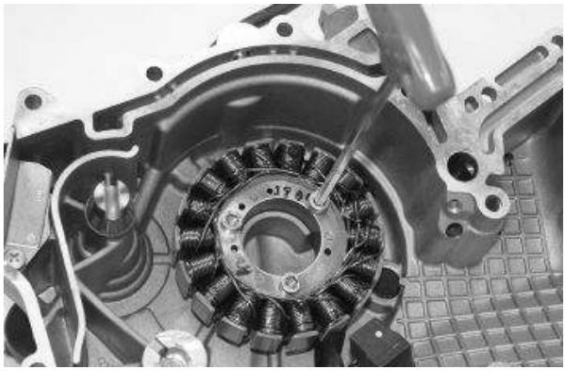
- Remove the gasket.

Dismantling the stator

- Remove the 2 fixing screws and the cable guide.



- Unscrew the 3 fastening screws and
Remove the stator completely with cables.



Check the lid components

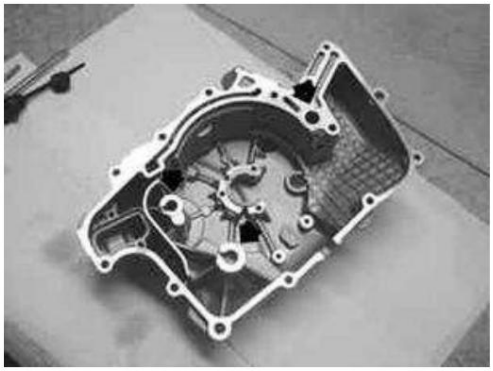
- Unscrew the 2 fixing screws and
the holder of the reed valve with separating plate
remove.

- The reed valve of the blow-by line together
Remove the men with the associated seal.

- Unscrew the fixing screw and remove the oil vapor
pipe together with the associated O-ring.

- Check that the mating surfaces on the housing are not worn or deformed.

- The seat of the by-pass valve, the running surface of the Torque limiter and the running surface of the Water pump shaft for signs of wear check.



Technical specifications

Diameter seat by-pass:

13,9 mm

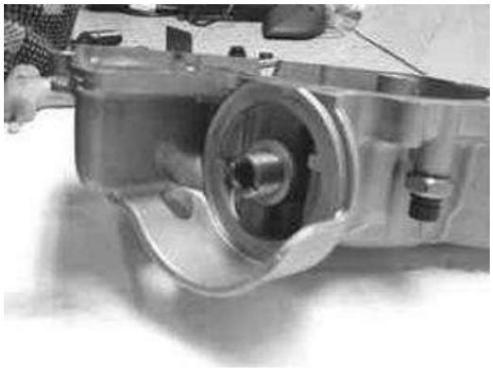
Diameter of starter shaft running surface:

12 mm

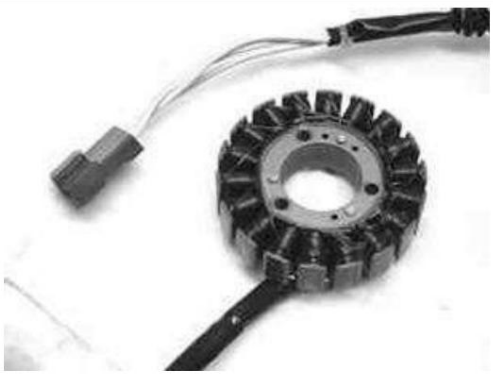
Diameter running surface water pump shaft:

8 mm

- Check that the mating surface and the oil fil The connection is not worn or deformed are.



- Check the stator and the associated cables for damage.



- The current continuity between the 3 phases

check.

ANNOTATION

THE VALUES STATED REFER TO MEASUREMENTS AT ROOM TEMPERATURE. WILL BE THE STATOR

CHECKED AT OPERATING TEMPERATURE, HIGHER THAN THE STATED VALUES ARE MEASURED.

Electrical information

Resistance:

0.2 ÷ 1 ÿ

- Check that each phase is iso to ground

is latched.

- If different values are measured, this must be done

the cabling must be checked carefully. The

Wiring consists of 2 different cables

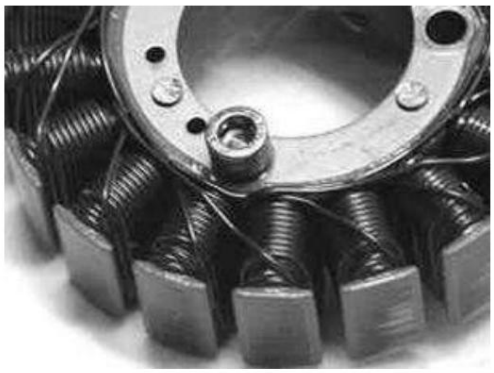
beln: Stiff cables near the stator and

soft cables up to the cable connector.

- Check that the windings are properly attached

are that they are the heads of the fastening screw

Don't touch Ben.



Installation of the stator

- Install the stator and the 3 fasteners

screw with the specified torque

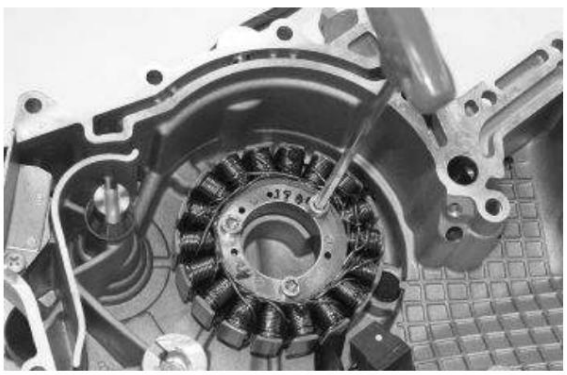
ment tighten.

ANNOTATION

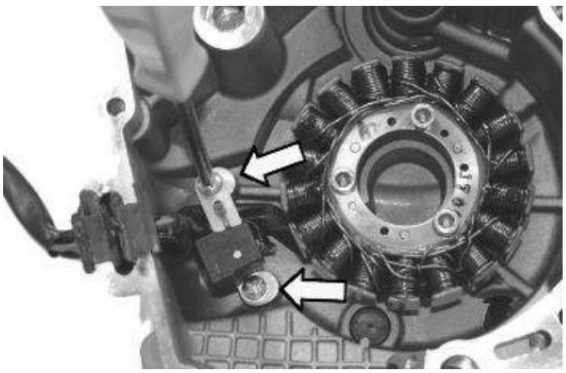
THE RUBBER SEALING OF THE CABLE BUNDLE MUST BE IN THE APPROPRIATE SEAT WILL BE PLACED ON THE HOUSING.

Torque guide values (N*m)

Fasteners stator 8 - 10



- Install the cable guide and secure the 2 fastening screws with the specified one Tighten torque.



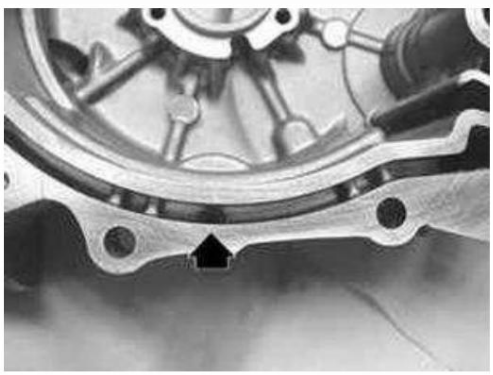
Torque guide values (N*m)

Cable guide fixing screws
Stator 3 - 4

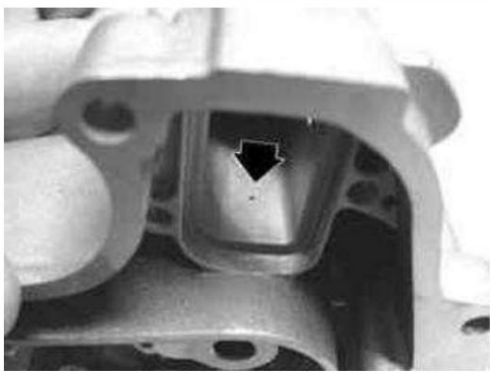
Installing the alternator cover components

- Before installation, all components must be cleaned thoroughly be cleaned.
- All lubrication lines must be on the cover housing checked. Particularly:
- The 3 by-pass lubrication channels.

- Supply line to the oil pressure sensor.



- Oil vapor outlet from the decanter chamber.



- The closure on the inspection opening for the phase adjustment of the valve control and the oil in Filler plug/dipstick for the engine oil provisionally attach correctly.
- The blow-by line with a new O-ring insert.
- The screw with the specified rotation tighten moment.

Torque guide values (N*m)

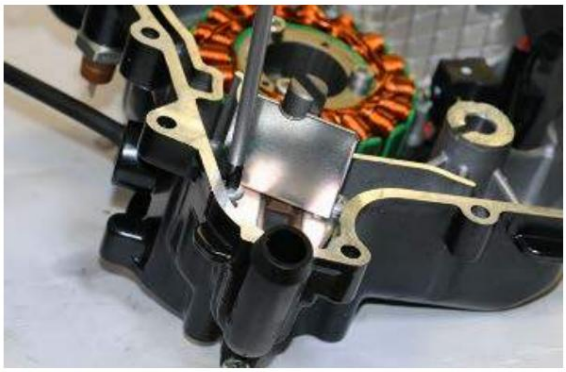
Fastening screws for the blow-by line
3 - 4

- The spring and the by-pass valve in the light Insert machine cover.

ANNOTATION

LUBRICATE THE BY-PASS VALVE.

- The blow-by reed valve with a new one Reinstall the seal.
- Reinstall the bracket with separating plate and the fastening screws with the given Tighten the specified torque.



Torque guide values (N*m)

Fixing screws bracket with separator plate 0.3 ÷ 0.4

- Insert the new O-ring carefully. The O-ring must not come into contact with grease and oil.

FAILURE TO FOLLOW THIS INSTRUCTION WILL RESULT IN PERMANENT DEFORMATION OF THE O-RING.

- Attach the water pump cover and the 6 Fastening screws with the specified tighten to a certain torque.

Torque guide values (N*m)

Pump cover fixing screws: 3 ÷ 4

Installation of alternator cover

- Install a new oil filter, the gasket

Lubricate by hand until it stops

screw and then with the provided

Tighten the specified torque.

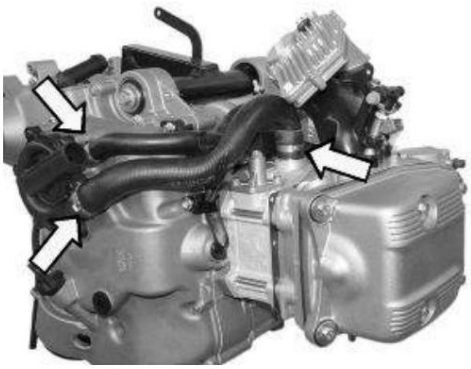
Torque guide values (N*m)

Engine oil filter 12 ÷ 16

- The sleeve of the supply line on the cylinder and the

Reattach the return line to the pump cover

and fasten with new clamps.



ANNOTATION

THE CLAMPS MUST BE WITH THE APPROPRIATE CLAMP PLIERS MUST BE INSTALLED MAKE SURE THAT ON THE ONE HAND HOSES ARE NOT PRESSED TOO STRONG, BUT ARE FIXED SUFFICIENTLY.

- The pre-filter and the oil drain plug again

attach and with the prescribed rotation

tighten moment.

- Fill the specified engine oil into the engine.

Suggested products

Motor oil 5W-40 synthetic-based lubricant for 4-stroke engines.

SAE 5W-40; JASO MA, MA2; API SL; ACEA A3

Torque guide values (N*m)

Oil drain plug engine oil 24 ÷ 30

- The seat of the intermediate gear with torque

ment limiter on the alternator cover

lubricate.

- The drive of the water pump on a Markie

Alignment and the alternator cover

as described in the alternator cover chapter

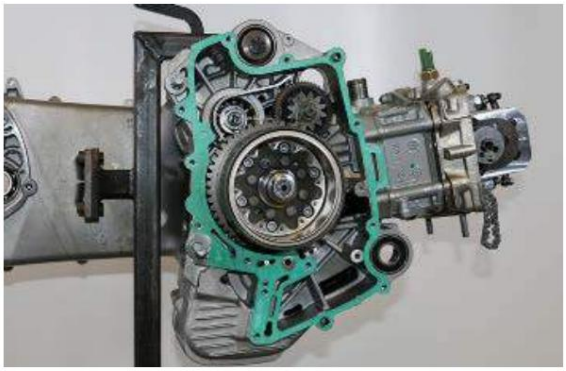
install.

- Install a new gasket on the engine housing

gen.

- Make sure the 3 centering pins are present

are.



- Turn the crankshaft until the drive

the countershaft to a mark on the gear

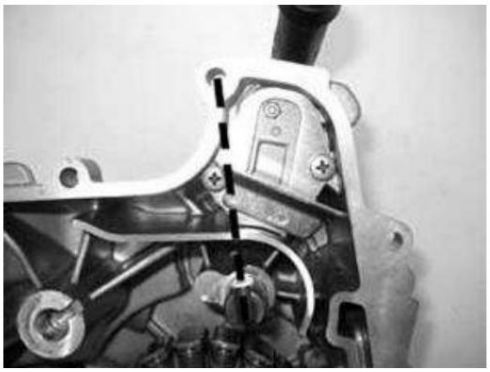
house is aligned (see illustration).

- The water pump shaft on the same mark

Align the connection on the housing.

ANNOTATION

THESE PROVISIONS ARE PARTICULARLY USEFUL IF THIS WORK IS CARRIED OUT WITH THE WATER PUMP COVER IN PLACE.



- Install the alternator cover, making sure that the stator and rotor are not in contact

jam.

WARNING

FAILURE TO FOLLOW THIS INSTRUCTION MAY RESULT IN THE BREAKAGE OF THE CERAMIC MAGNETS LEAD.

- The alternator mounting screws

nenlid according to the position noted during removal

position, ensuring correct assembly

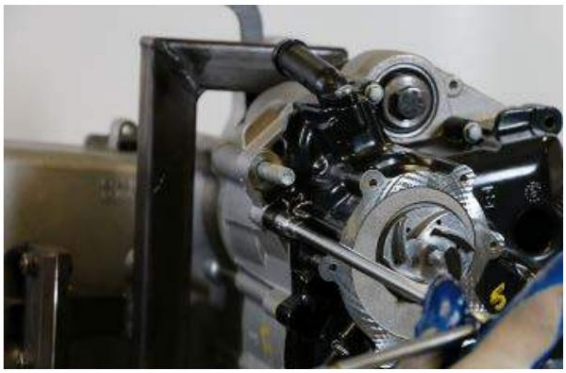
the cable routing of the oil pressure sensor and the

Pay attention to the holder of the sleeve.

1 medium screw 75 mm

9 medium length screws 40 mm

3 short screws 31 mm



Torque guide values (N*m)

Alternator cover screws 11 ÷ 13 Nm (8 ÷ 10 lb*ft)

Alternator and starter system

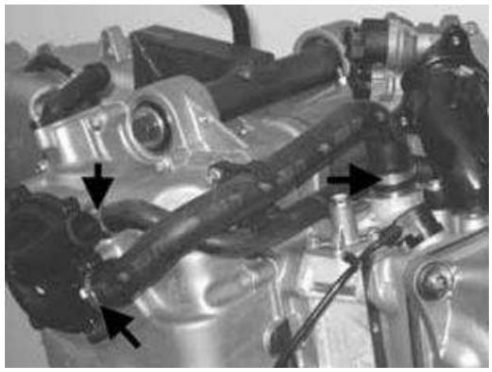
- To make the alternator cover easier to remove

To be able to build, the three in the illustration must

The clamps shown in the diagram are removed and the socket

the supply line on the cylinder and the return line on

Pump cover must be removed.



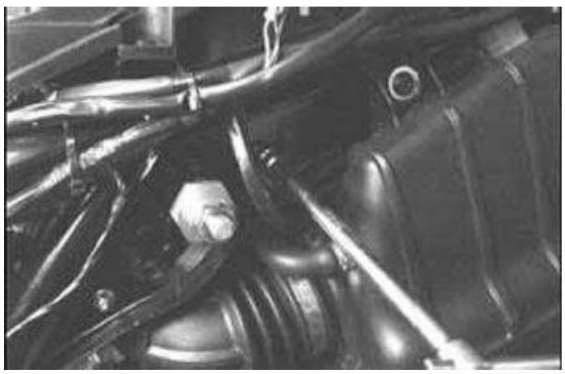
ANNOTATION

**THE CLAMPS NEED TO BE REPLACED.
THEY CAN BE OPENED WITH A SCREWDRIVER
OR CUT THROUGH FOR REMOVAL.
MAKE SURE THAT THE PLASTIC CONNECTIONS
ARE NOT DAMAGED.**

The starter motor is sold complete.

Before replacing the starter motor,

the following must be checked:



1 - **Battery**

Measure the battery voltage in idle state

(rest for a few hours): Voltage

> 12.5 V.

Check the electrolyte density in each battery element

fen:

Baby = 30 ÷ 32

Specific gravity: 1.25 ÷ 1.26

YES point 2 NO point 3

2 - The correct connection of the negative terminals

(negative terminal of the battery and ground connection of the

starter motor) with each other and with the yard

check menu.

YES - point 4 NO point 5

3 - Charge or change the battery if necessary.

4 - Connect the diagnostic tester (see chapter «Injection»).

The induction clamp of an ammeter on the positive cable of the starter motor power supply

connect.

Remove fuse No. 12 with 10 A (see chapter “Fuses”).

With the switch in “RUN” and the side stand raised, set it to “ON”.

Select the «PARAMETER» function from the menu.

Only operate the starter switch (the engine cannot start) until the speed and

the current consumption of the starter motor can be measured.

ANNOTATION

THE SPEED VALUE STATED IS THE VALUE DISPLAYED BY THE DIAGNOSTIC TEST EQUIPMENT. THE ACTUAL RPM IS NOT RECORDED, BUT THE VALUE IS VALID FOR THE CHECKS.

Special tool

020922Y Diagnose-Instrument

Electrical information

Current consumption at driving speed:

80 ÷ 120 A

Speed =

~ 300 ÷ 400 U/Min

YES point 6 NO point 7 NO point 8 NO point 9 _____

5 - Reconnect the connections.

6 - **The values are OK.**

As a final confirmation, check the current consumption without load.

Remove the starter motor (see Alternator and Starter System chapter).

Reconnect ground and plus and check.

Electrical information

Current consumption without load:

<40 A

YES point 10 NO point 11

7 **- Low driving speed**

High current consumption

Check the engine rotation (example: damage to the crankshaft bearing), if no errors are found,

the starter motor needs to be replaced.

8 **- Low driving speed**

Low power consumption

Repeat the check, bridging or, better yet, replacing the connections on the remote relay

schen.

Check the new values.

YES point 12 NO point 13

9 **- High driving speed**

Low power consumption

The engine turns too easily, check the pressure at the end of compression.

If the values differ, proceed as indicated.

10 - The starter motor is OK.

11 - Check the armature rotation.

12 - Definitely replace the starter remote relay.

13 - Check the battery again and replace the starter motor if necessary.

ANNOTATION

IF THE CRANKSHAFT DRIVE SPEED IS LOW AND UNUSUAL NOISE IS PRODUCED AT THE SAME TIME, THE FREEWHEEL AND TORQUE LIMITER MUST BE CHECKED (SEE CHAPTER “ALTERNATOR AND STARTING SYSTEM”).

STARTER MOTOR

Technical information	Description/Value
Type	Mitsuba sm13d
Performance	0,9 kW

BATTERY

Technical information	Description/Value
capacity	14 Ah
Starting current	125 A

REMOTE STARTER RELAY

Technical information	Description/Value
Type	MAINTENANCE FREE
payload	150 A constantly

STARTER TRANSMISSION

Technical information:	Description/Value
gear ring and freewheel coaxial with the flywheel.	Intermediate gear integrated with torque limiter.

The starter system consists of a drive between the starter motor armature and the crankshaft
Freewheel mounted coaxially to the flywheel and torque limiter on the intermediate shaft.
The torque limiter is calibrated to 10 kgm (100 N m). This component is used to protect the
Conditions of the engine and the starter gear in the event of an incorrect starting process with rotation in Ge direction.
The freewheel enables sufficiently quiet starting.
The start signal (triggering of the remote relay) is via the start release switches on the side stand and
The emergency stop switch is released (OFF/RUN), meaning the vehicle cannot be started in the event of danger become.
The starter control circuit is not monitored by the immobilizer system. Before the occasion
If the power system is somehow bypassed, the immobilizer should first enable the start
be checked.
For checking the circuits for start release, see the “Electrical system” chapter. For the
Checks for driving the crankshaft as described in the “Alternator and starter system” chapter
ben proceed.

Removing the starter motor

ANNOTATION

THE STARTER MOTOR CAN BE REMOVED EVEN WITH THE ALTERNATOR COVER INSTALLED.

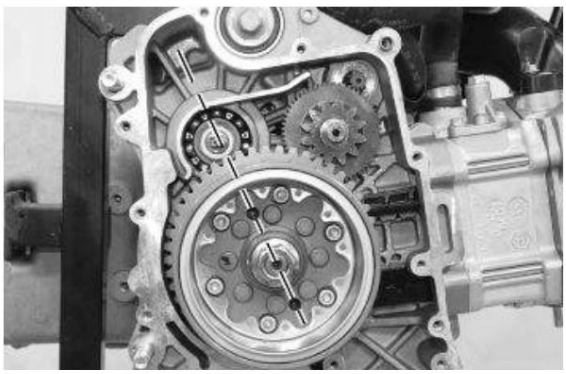
- Unscrew the fastening screws.

2 screws

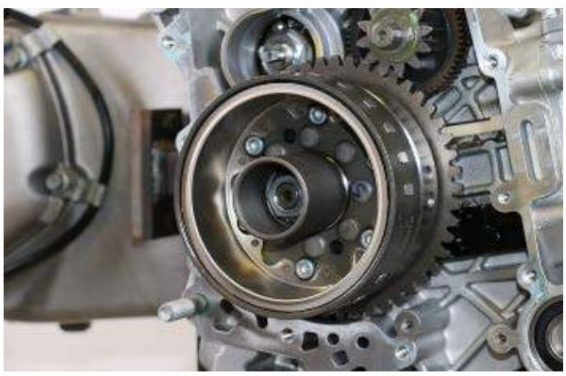
- Remove the ground cable and the cable retaining bracket, then the complete starter motor pull out gate.

Removing the flywheel magneto

- Align the two holes on the flywheel with the openings on the housing so that the special tool is attached can be.



- The bushing belonging to the locking tool onto the thread for the extractor screw.



- Attach the special tool as shown in the illustration. Make sure that the pins are perfectly aligned with each other Openings are inserted and that the tool is inserted up to the stop (almost flush with the flywheel) is attached.

Special tool

020472Y Key to block the alternator

- The fastening nut of the flywheel magnet

Unscrew the igniter.

- The special tool, the fastening nut

and remove the washer underneath

with.

- Put the nut back on so far that the

Wave is just covered, and so that the

space previously used by the washer

remains free.

DANGER

**THIS STEP IS NECESSARY BECAUSE THE MAGNETIC IGNITION IS VERY STRONG
IS BLOCKED. WHEN REMOVING THE CONICAL PART, THE ROTOR COULD FALL OUT AND THE MAGNETS COULD
BE DAMAGED.**

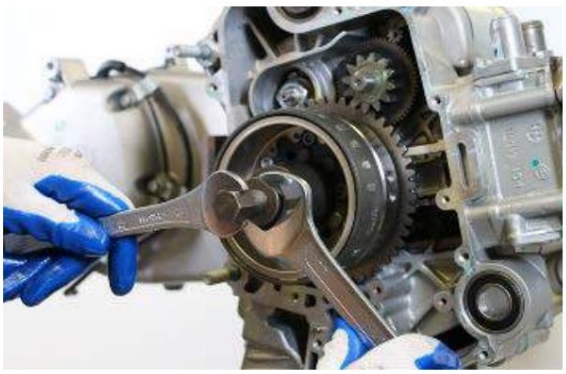
- Apply the specified puller.

- With a 27 mm key and a 19 mm

Loosen the flywheel magneto socket.

Special tool

020467Y Flywheel puller

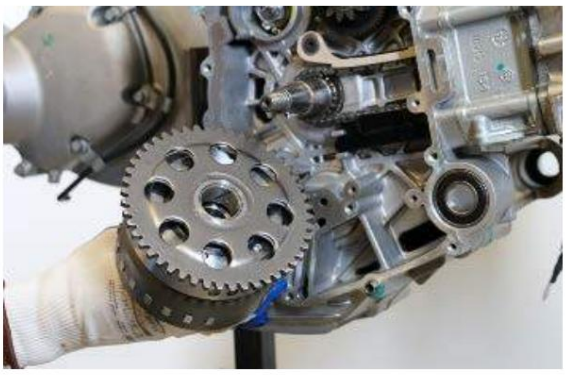


- Remove the puller.

- Remove the nut and the flywheel magnet

Pull out the igniter complete with starter ring.

- Remove the key from the crankshaft.



- To remove the starter ring from the freewheel

To be able to do this, it must be turned counterclockwise

rotated and removed.

- Unscrew the 6 fixing screws and the freewheel from the flywheel magneto Remove.

IF THE FREEWHEEL IS TO BE REMOVED, THE 6 FASTENING SCREWS SHOULD ALREADY BE INCLUDED STILL ATTACHED TO THE CRANKSHAFT FLYWHEEL TO BE LOOSED.

- The freewheel is designed with the highest precision Flywheel fitted. In case of difficulties During removal, 2 screws can be removed (see Figure) as starting points and pull-out device must be attached.

- The intermediate gear with torque limitation pull off.

Check components of the flywheel magneto

- Check the magnets for completeness.
- Check that the magnet holders are not are deformed or damaged.
- Check that the riveting of the swing wheel is not loosened.

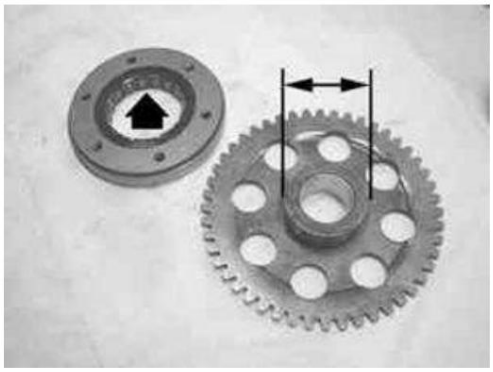
Starter wreath

- The «rollers» of the freewheel and the hub of the An

for signs of wear and tear

Check prints.

- Measure the outside diameter of the hub.



Technical specifications

Hub outer diameter:

Ø 45,665 + 0,008 +0,005 mm

- The inner diameter of the bearing bush on An

welderkranz knives.

- Check the teeth on the starter ring for wear

check.

Technical specifications

Inner diameter of the bearing bush:

Ø 27 + 0,020 +0,041 mm

ANNOTATION

IF ANY TRACES OF WEAR OR DAMAGE ARE FOUND ON THE HUB, SHOULD THE STARTER GEAR AND FREEWHEEL ARE REPLACED.

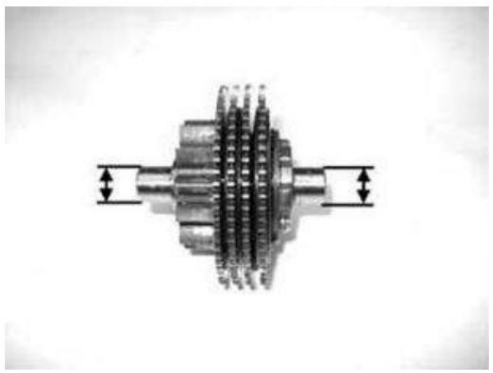
IF THERE ARE TRACES OF WEAR ONLY ON THE BEARING BUSH, THE STARTER GEAR CAN BE COMPLETELY REPLACED. IN THIS CASE, THE DIAMETER OF THE BEARING RUNNING SURFACE ON THE CRANKSHAFT SHOULD ALSO BE MEASURED. IF THE VALUES ARE DIFFERENT, THE CRANKSHAFT MUST BE REPLACED.

intermediate gear

- Check the teeth for wear.

- Measuring the diameter of the two treads

its.



Technical specifications

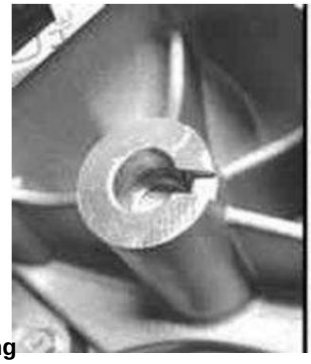
Diameter of gear running surface:

Ø 12 - 0 - 0,011 mm

Also the diameter of the treads

Alternator cover and on the engine housing

measure.



Technical specifications

Diameter of the running surface on the alternator cover:

Ø 12 + 0,034 -0,016 mm

Diameter of the running surface on the engine housing with:

Ø 12 + 0,034 -0,016 mm

ANNOTATION

THE TORQUE LIMITER HAS 4 GEARS WHICH PERFORM THE FUNCTION OF CLUTCH GUIDE DISKS.

The guided discs consist of 4 discs

with a notched profile. The structure of this assembly

enables the transmission of torque

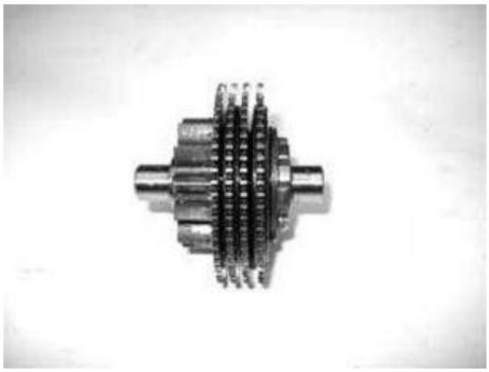
of less than 10 kgm.

If incorrect starting maneuvers are carried out, the

torque limiter prevents kickbacks

Reversal of the direction of rotation of the crankshaft and there

caused by damage to the engine.



No revision can be made to the torque limiter. Are there any damages?

Visible on the toothed washers, the entire assembly should be replaced.

Installation of freewheel

- Check that the freewheel contact surfaces are in good condition.
- Thoroughly clean the freewheel of any LOCTITE residue.
- Degrease the threads on the freewheel holes and the screws.
- Attach the recommended product to the screw ends.

Suggested products

Loctite 243 Medium strength thread locking sealant.

Colour blue

- Attach the freewheel to the flywheel magneto.

Make sure that the ground side

rests on the flywheel. i.e. the circlip of the

Freewheel remains visible.

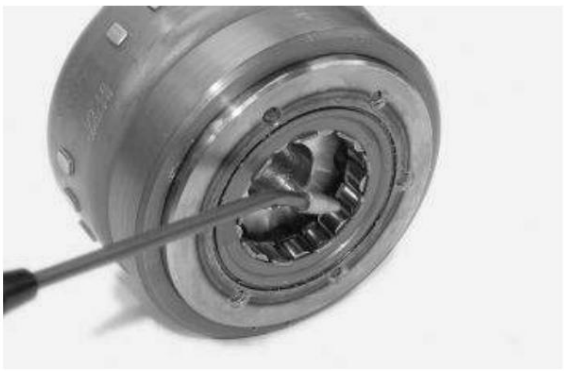
- The 6 fastening screws crosswise

Tighten to the specified torque.

Torque guide values (N*m)

Fastening screws freewheel to flywheel 13 ÷ 15

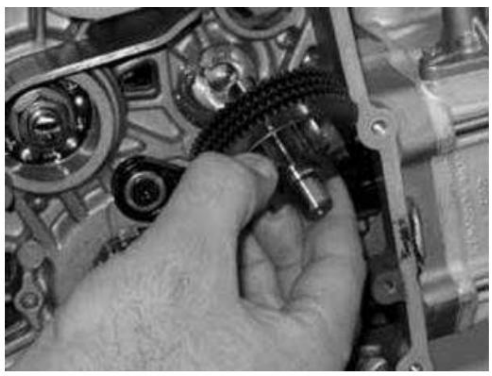
- Lubricate the freewheel “rollers”.



Installation of intermediate gear

- Grease the gear seat on the motor housing.

- The intermediate gear with torque limitation insert.



- The inside of the liner and the hub of the

Oil the starter ring.

- Turn the starter ring clockwise and

insert into the flywheel at the same time.

Installation of flywheel magneto

- Insert the key into the crankshaft.

- Attach the flywheel magneto. Included

at the same time ensure that the wedge is inserted correctly

pay attention and the teeth of the torque limiter

and starter ring mesh correctly.

- The washer and the nut on the Kur

Attach bell shaft.

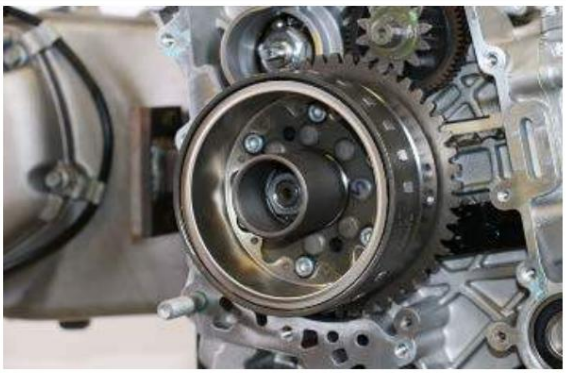
- The guide bushing, which is part of the tool
Blocking of the flywheel magneto is until
Screw it on until it stops and then turn it around
Loosen ¼ turn.

ANNOTATION

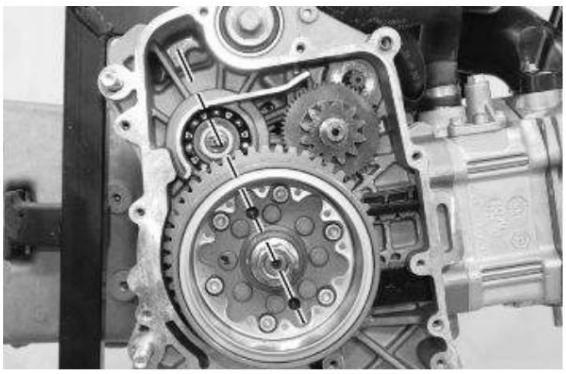
IF THIS INSTRUCTION IS NOT OBSERVED, THE GUIDE WILL STAY ON THE FLYWHEEL.

Special tool

020472Y Key to block the light machine



- The 2 located on the flywheel magneto
Align the holes with the openings on the housing
so that the special tool is attached
can be.



- Attach the special tool. To ensure,
that the pins fit perfectly into each other
aligned openings are inserted.

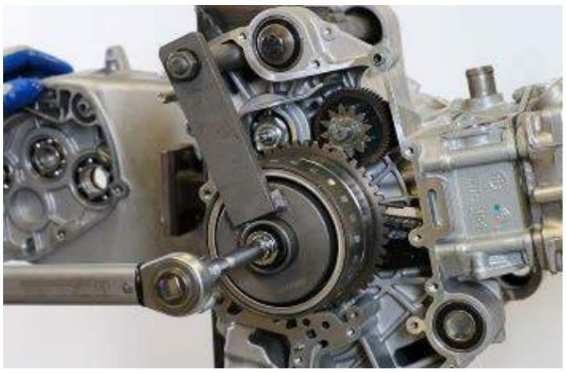
Special tool

020472Y Key to block the light machine

- The fastening nut of the flywheel magnet
igniter with the specified torque
screw tight.

Torque guide values (N*m)

Fastening nut flywheel 115 - 125



Installation of starter motor

- Check the condition of the O-ring and this lubricate.

- Insert the starter motor.

- The fastening screws with the ground cable and mount the cable retaining bracket, as shown shown in the photo.

2 screws

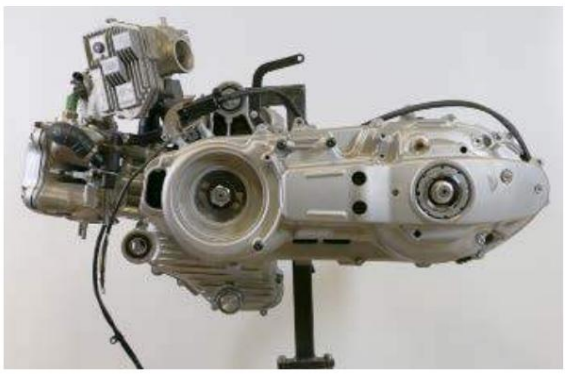
- The screws with the specified rotation tighten moment.

Torque guide values (N*m)

Starter motor fixing screws 11 ÷ 13

Thermal unit and valve control

- Remove the outer and inner drive covers with.

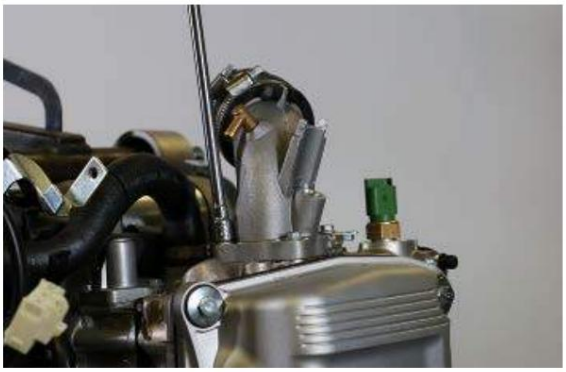


- The alternator cover, the flywheel and remove the torque limiter.

Removing the intake manifold

- Unscrew the 3 fastening screws.

- Completely remove the intake manifold assembly with.



Removing the valve tappet cover

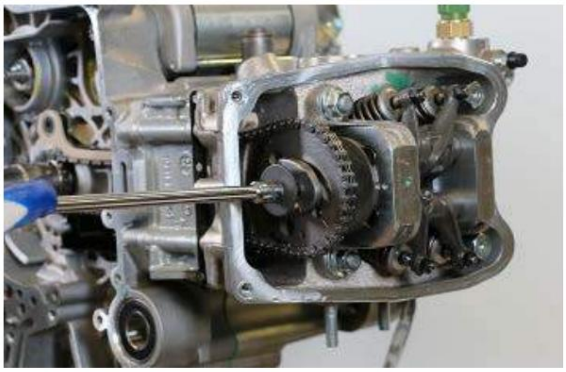
- Unscrew the 4 flange screws to Remove valve cover.

- Lift the valve cover and onto the gasket regard.

Removing the valve control drive

- Turn the engine until the inlet valve

are closed.



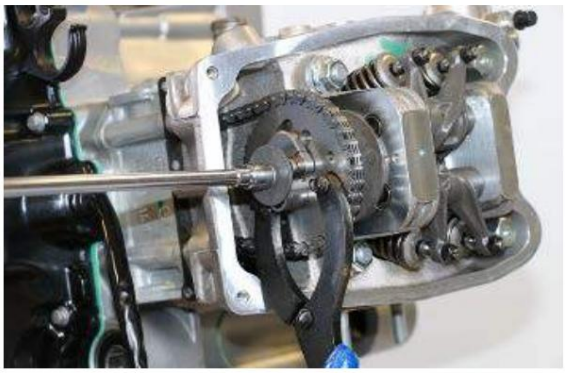
- The central nut and the valve holding basket

lifting mass with the specified special mechanism

remove stuff.

Special tool

020565Y Face wrench for blocking
the alternator



- The return spring and the valve lifter mass are closed

Remove together with the stop washer.

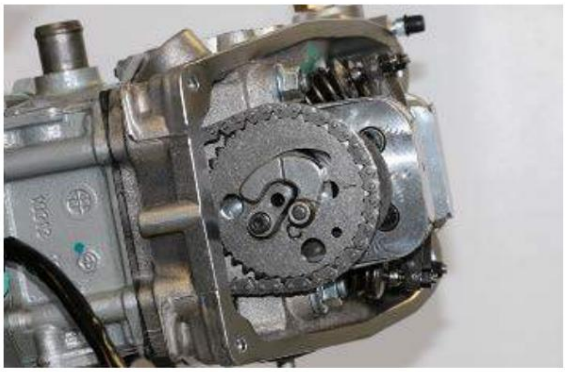
- The markings on the crown of the vein

The timing chain and the cylinder head meet each other

align as shown in the photo.

ANNOTATION

MAKE SURE THAT THE SPRING AND WASHER DO NOT PASS THROUGH THE CHAIN COMPARTMENT ENGINE FALLS.



- In preparation for the next work step

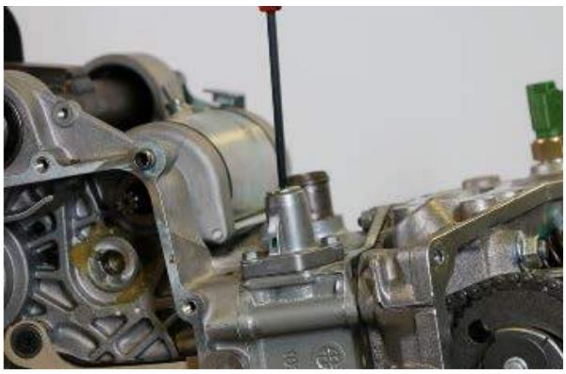
must be the central screw of the chain tensioner

be solved.

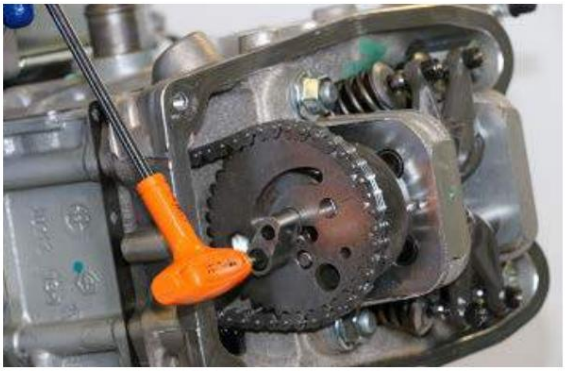
- Unscrew the 2 fixing screws and

the chain tensioner together with the associated one

Remove the seal.



Remove the Allen screw and counterweight (see illustration).



- Remove the valve timing chain sprocket from No

remove the crankshaft.

- Remove the valve timing chain sprocket.

Removing the camshaft

- Unscrew the 3 fastening screws and

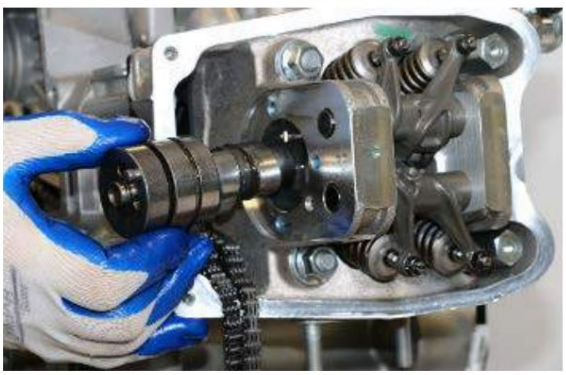
Remove the camshaft mounting bracket

with.

ANNOTATION

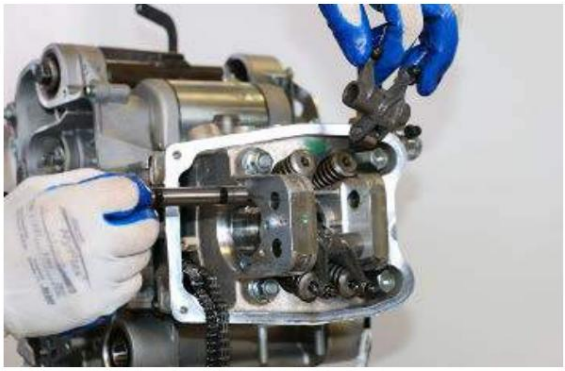
**MOUNTING SCREWS MAY BE DIFFICULT TO REMOVE. PAY ATTENTION TO THE INSIDE
NOT TO DAMAGE HEXAGON. POSSIBLY. FIRST LOOSEN THE THREADS.**

- Remove the camshaft.



- The pins and the rocker arms through the hole

Remove the connectors on the gearbox side.



Cylinder head removal

- Remove the spark plugs.

- The sleeve at the outlet of the cooling system is complete remove with thermostat.

- The 2 nuts on the cylinder head, one on the outlet side and one on the inlet side, ent distant.

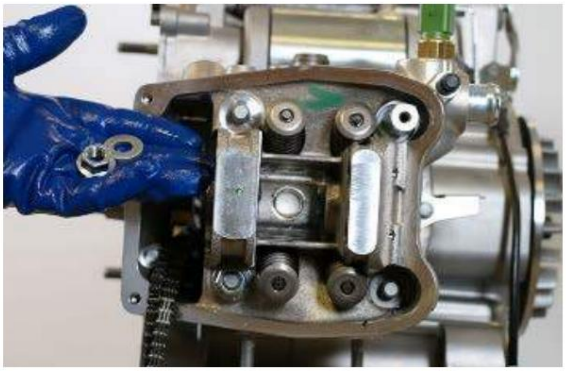
- The two side M6 fasteners in the valve compartment and the M6 fastener on the ignition

Remove the candle side completely with the thermostat holder.

ANNOTATION

IF NECESSARY, THE CYLINDER HEAD CAN BE REMOVED COMPLETELY WITH THE CAMSHAFT, SWINGARM PIN AND BRACKET.

- Loosen the 4 cylinder head - cylinder fastening screws in 2 - 3 passes in a criss-cross pattern.
- The cylinder head, the 2 centering pins, you Remove the cable and the lower chain guide.



ANNOTATION

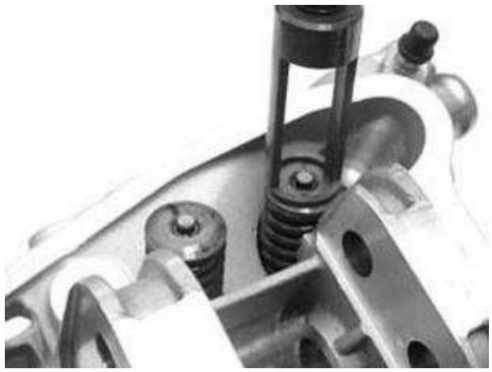
IF THE CENTERING PINS ARE CLAMPED TIGHTLY INTO THEIR SEAT, THERE IS NO REMOVAL.

DANGER

A SUITABLE CONTAINER MUST BE PROVIDED FOR REMOVAL OF THE CYLINDER HEAD BECAUSE THE CYLINDER HEAD CONTAINS COOLANT.

Removing the valves

- With the specified special tool that comes with be equipped with the appropriate adapter must, the half cones, spring plates, springs and the Remove valves.



Special tool

020382Y Tool for removing the valve Half cone equipped with part 012

020382Y012 Cylindrical spacer (Tool for removing the valves)

DANGER

SET THE VALVES Aside SO THAT THEIR ORIGINAL INSTALLATION POSITION CAN BE RECOGNIZED DURING LATER INSTALLATION (ALTERNATOR SIDE, DRIVE SIDE).

- The oil seals with the specified special remove tool.

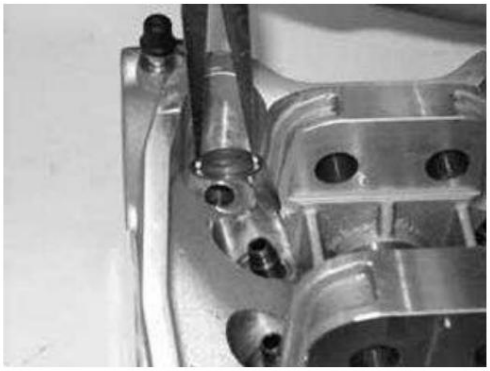
Special tool

020431Y Oil seal valve puller

- Remove the spring supports.

ANNOTATION

TO EASIER REMOVAL OF THE SPRING PADS, COMPRESSED AIR CAN BE BLOWED INTO THE SEATS.



Cylinder - piston removal

- Remove the valve timing chain.

- Unscrew the fastening screw and the

Spacer and the chain tension shoe

distant.

ANNOTATION

THE VALVE TIMING CHAIN SHOULD BE MARKED SO THAT THE ORIGINAL RUNING DIRECTION CAN BE MAINTAINED.

- The cylinder with the associated seal and

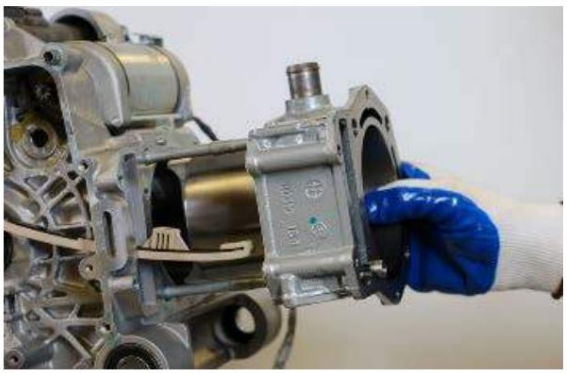
pull off the centering pin.

ANNOTATION

THE SECOND CENTERING PIN IS FIRMLY PRESSED INTO THE CYLINDER.

DANGER

TO AVOID DAMAGE TO THE PISTON, THE SER MUST BE HELD WHEN REMOVAL OF THE CYLINDER.



- Remove the 2 piston pin circlips via the corresponding

grooves.

- Pull out the piston pin and the piston

Remove.

ANNOTATION

SEAL THE CYLINDER OPENING ON THE ENGINE CASE WITH PAPER OR A CLOTH SO THAT THE TWO SNAP RINGS OF THE PISTON PIN CANNOT FALL INTO THE ENGINE INSIDE.

- The piston rings and the oil scraper from the col remove ben.

DANGER

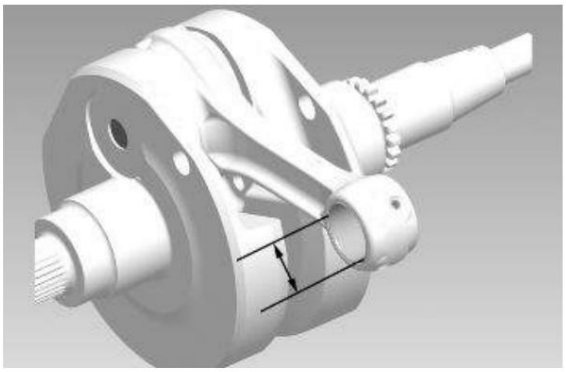
WRITE DOWN THE INSTALLATION POSITION OF THE PISTON RINGS SO THAT THEY CANNOT BE MIXED UP IN ANY WAY OF INSTALLATION.

ANNOTATION

ENSURE THAT THE PISTON RINGS ARE NOT DAMAGED DURING DISASSEMBLY.

Checking the connecting rod head

-Use an internal bore gauge to determine the diameter Measure the connecting rod base and check whether the value in within the **“Technical Data”** section given limits.



- If the measured value is incorrect, the crank shaft as **described in the “Crankshaft”** chapter **"build"** described, exchange.

Check piston pin

Check that the operating limits of the piston pin are within the values specified in Section **"Technical data"** are given. If the measured values are not correct, the col ben bolts need to be replaced.

Check piston

- Check that the operating limits of the piston and the coupling values with the cylinder are within the values specified in the **“Technical data”** section . If the measured values are not are correct, the piston and/or cylinder must be replaced.
- Check that the coating on the cylinder is not deformed or peeled off.
- Check that the mating surfaces with the cylinder head are not worn or deformed.

ANNOTATION

Pistons and cylinders must be coupled taking the classes into account. It is not possible to assemble components of different classes.

Check piston rings

- Place the 3 piston rings one after the other in the area of the cylinder, where it still has its position original diameter. The piston rings using the piston at right angles to the cylinder Insert axle.

- Check that every single piston ring is the same lies moderately against the cylinder liner. Abnormal wear of the piston ring is a sign that this is not the case. Replace.

- The opening of the piston ring joints as shown in Fig education shown measuring with a dial gauge.

- If the values are higher than those in the section **"Technical data"** stated, drive continue with the replacement of the segments.

Installation of pistons

- The piston and the piston pin on the connecting rod attach head. Attach the piston so that the arrow points to the outlet opening.

- Insert the piston pin circlip into the Use the specified special tool.

S = links

D = right

- Remove the piston pin circlip with a Install punch mandrel.

- The piston pin retaining ring as shown in

Install with a mandrel shown in the illustration.

Special tool

020470Y Assembly tool for piston pin retainers

ANNOTATION

THE TOOL FOR INSTALLING THE CIRCUIT RINGS-PISTON PIN MUST BE USED MANUALLY.

DANGER

IF A HAMMER IS USED, THE SEATS OF THE COCK RINGS MAY BE DAMAGED.

Selection of seal

- The cylinder temporarily without the cylinder base seal

Attach the device to the piston.

- A dial gauge with the short connection on

Attach special tool (see illustration).

Special tool

020475Y Tool for checking piston position

- The dial indicator on a support surface with a

Set the preload of a few mm to zero.

- Tighten the dial indicator definitely.

- Check that the button works correctly.

- Attach the tool to the cylinder without the

Change the position of the dial indicator.

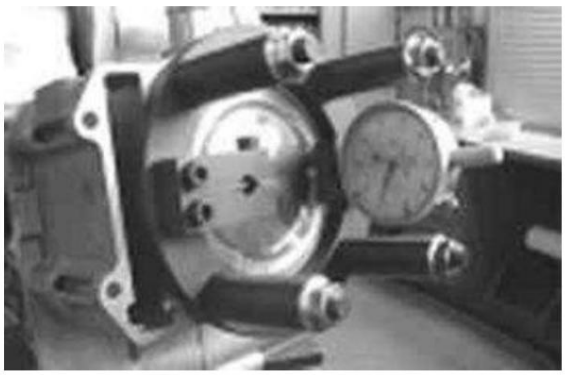
- The tool with the original cylinder head nuts

fasten tern.

- Turn crankshaft to TDC. (reversal point of

dial indicator rotation).

- Measure the deviation from the zero point.



- Use the table in the **“Technical data”** section to determine the thickness of the cylinder base gasket,

which must be used for reinstallation. Only if the strength of the cylinder is correctly determined

The correct compression ratio is maintained in the base seal.

- Remove the special tool and the cylinder.

ANNOTATION

DEVIATIONS (OVERHANGING OR SETTING BACK) ARE MEASURED CLOSE TO ONE CATEGORY LIMIT, THE MEASUREMENT MUST BE FROM THE OPPOSITE PAGE TO BE RUN AGAIN. FOR THIS PURPOSE, THE POSITION MUST BE SWAPED WHEN ASSEMBLYING THE TOOL.

Installation of piston rings

- Attach the oil scraper spring to the piston

gen.

- Install the oil scraper so that its opening is

The spring connection is opposite and

the lettering Top faces the piston crown. On

In all cases the processing edge must go to the col

show benboden.

- The second piston ring with the code letter

ben or the lettering Top so that

these point towards the piston crown. Absolutely allowed

the processing edge does not face the piston crown

show.

- When installing the first piston ring (compression ring),

use the installation position specified by the seat

Observe the instructions.

- A ge. should be used to attach the piston rings

A suitable attachment device must be used.

ANNOTATION

THE 2 PISTON RINGS ARE MANUFACTURED WITH A CONICAL CONTACT SURFACE TO THE CYLINDER BEEN. THIS ENSURE BETTER BREAK-IN.

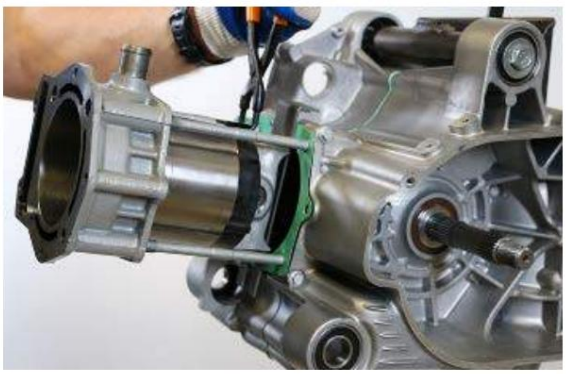
- Install the piston ring joints offset by 120° (see illustration).

- Lubricate all components with engine oil.

- In this engine, the first piston ring has an L-shaped cross section.

Installation of cylinders

- Install the cylinder base gasket with the previously determined thickness.
- Using the fork to place the piston and the clamp, fix the cylinder as shown in the picture install.



ANNOTATION

BEFORE INSTALLING THE CYLINDER, THOROUGHLY BLOW THROUGH THE LUBRICATION LINES AND OIL THE CYLINDER TUBE. MAKE SURE THE TWO CENTERING PINS ARE PRESENT.

Special tool

020468Y Clamp for piston installation

020512Y Fork for installing the piston

Check cylinder head

- Using a smoothly ground rod and a blade gauge, check that the cylinder head bearing surface is not worn or deformed.

Technical specifications

Maximum permissible deviation:

0,1 mm

- If abnormalities are found, the cylinder should be the head needs to be replaced.
- The sealing surfaces with the intake port and check the exhaust manifold.
- The running surfaces of the camshaft and the Check rocker arm bolts for wear.
- The contact surface of the cylinder head cover Check wear.
- Check the coolant seal buffer for oxidation check traces.

Checking the valve control components

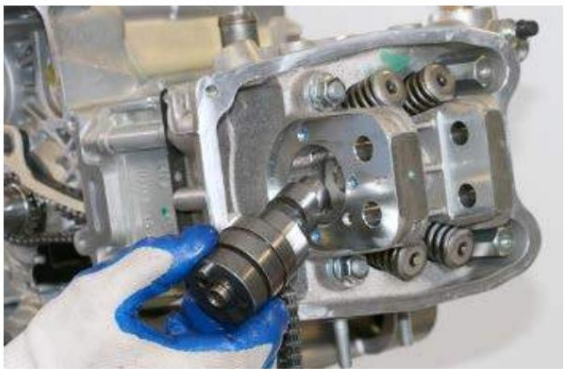
- Check whether the chain tensioner pad and the chain tensioner is not excessively worn are.

- The unit drive sprocket camshaft and

Check crankshaft pinion for wear.

- If there is any wear and tear, the appropriate ones must be taken into account

Components are replaced. When worn Chain or sprocket must be the entire unit be replaced...



ANNOTATION

IF THE PINION HAS BEEN DAMAGED BY THE CHAIN, THE CRANKSHAFT MUST BE REPLACED. SEE INSTRUCTIONS IN THE CHAPTER “ENGINE CASE AND CRANK SHAFT”.

Chain tensioner

- Remove the middle screw and the Unver

Check seal integrity.

Chain tensioner

- Make sure that the mechanism does not shows wear and that the chain tensioner correctly when turning with a screwdriver can be activated or deactivated.

- If wear or malfunctions are detected the chain tensioner must be replaced the.

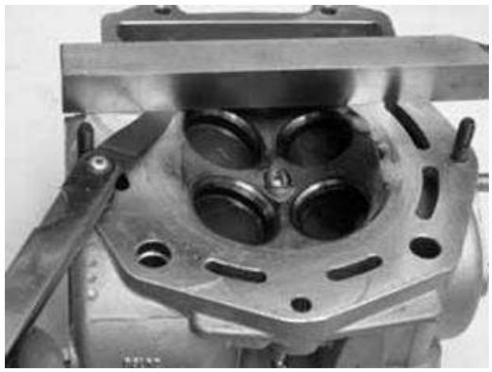
Check valve tightness

- Carry out a visual inspection of the valve sealing surfaces.

DANGER

DO NOT MIX THE INSTALLATION POSITION OF THE VALVES (RIGHT - LEFT).

- If the sealing surface of the valve is interrupted or irregular at one or more points, the valve must be replaced.



- Insert the valves into the cylinder head.
- Check the inlet and outlet valves alternately.
- The valves can be opened by simply pressing with a fin

Hold the ger firmly, pour petrol into the nozzles and check that no petrol comes out of the sealing surface from the valves.

Check wear of the valve seats

- Clean the seats and valves of any combustion residues.
- Check that the operating limits are within the values specified in the **"Technical data"** section.

- If the impression on the valve seat is wider than the specified value, the valve seat must be cut with a 45° milling cutter processed and then ground out.
- If there is excessive wear or damage, the cylinder head must be replaced.

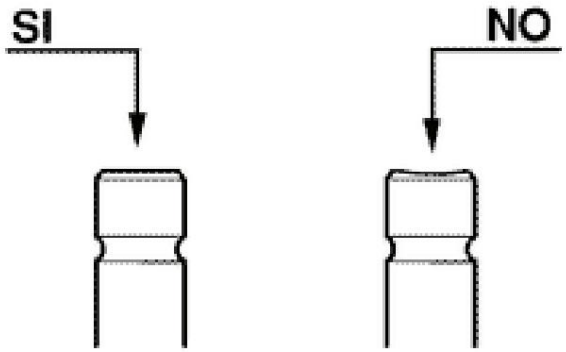
Checking the valves

Check that the operating limits of the valves are within the values specified in the **"Technical Data" .** If the measured values are not correct, the part in question must be replaced be replaced.

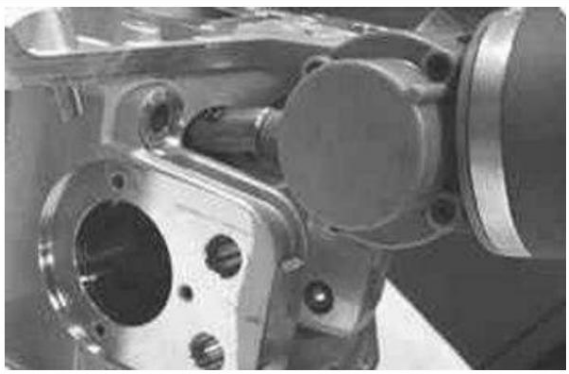
Check the fitting clearance of the valve guide

Verify that the operating limits of the valve guides are within the values specified in Section **"Technical data"** are given. If the measured values are not correct, the be relevant part must be replaced.

- Check that there is no wear on the contact surface with the joint part of the adjusting screw traces are visible.



- Were subject to the checks described above no irregularities were found the same valves are reinstalled. Around To achieve greater tightness, they should Valves are ground with valve grinding paste the. Be very careful when doing this work and use a very fine valve grinding paste. When grinding in the cylinder head with the veins Keep the tilt axles horizontal. This avoids that residues of the valve grinding paste get into the valve guide (see illustration).



DANGER

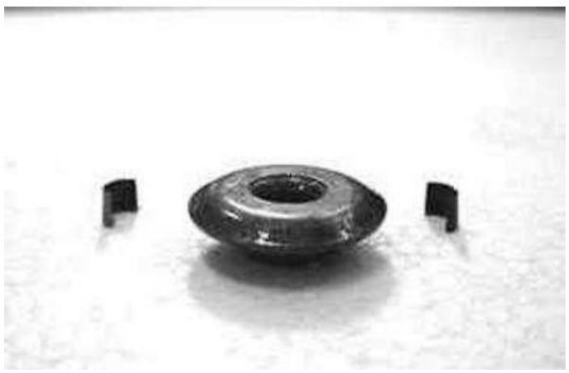
TO AVOID SCRATCHES ON THE CONTACT SURFACE, DO NOT ROTATE THE VALVES WHILE GRINDING WHEN THE VALVE GRINDING PASTE IS APPLIED. THOROUGHLY CLEAN THE CYLINDER HEAD AND VALVES WITH A ZUR WASH A PRODUCT SUITABLE FOR REMOVAL OF THE VALVE GRINDING PASTE.

DANGER

DO NOT MIX THE INSTALLATION POSITION OF THE VALVES (RIGHT - LEFT).

Check springs and half cones

- Check that the upper and lower spring plates, the half cones and the oil seals are not abnormal are worn out. Otherwise, this must be the case corresponding component must be changed.



- Measure the free spring length.

Technical specifications

Standard length:

44,4 mm

Permissible limit value after use:

42,4 mm

Installation of valves

- The rests of the valve springs in the cylinder head insert.

- With the specified special tool

Insert the 4 valve sealing rings alternately.

- The valve sealing rings and the valve guides lubricate.

Special tool

020306Y Impact mandrel for installing the valve sealing rings

- The valves, the springs and the spring plates lead. With the specified special tool and adapter compress the springs and attach the half cones to their seats.

Special tool

020382Y Tool for removing the valve Half cone equipped with part 012

020382Y012 Cylindrical spacer (Tool for removing the valves)

ANNOTATION

DO NOT MIX THE INSTALLATION POSITION OF THE VALVES. INSTALL THE VALVE SPRINGS SO THAT THE MARKING COLOR POINTS TOWARDS THE HALF-CONES (SPIRALS WITH LARGER SPACING).

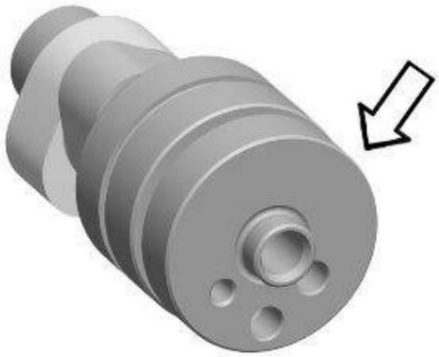
Check camshaft

- Check the running surfaces of the camshaft with a microphone measure rometer.

-Measure the cam height with a gauge.

- If abnormal wear or other Values than those in the **"Technical data"** section specified, the No. must be determined Camshaft needs to be replaced.

- The groove and the corresponding retaining plate Check for wear (see illustration).



- Check that the cam for the automatic Valve lifter and the end stop roller no Ver show wear.

- The spring of the valve lifter for overstretching check.

- In case of wear and tear, the appropriate construction must be carried out parts need to be replaced.

- Check the rocker arm pins for scratches and wear.

Technical specifications
Standard diameter:

Ø 13 - 0,010 -0,018 mm

- The inside diameter on each rocker arm measure.

Technical specifications
Standard diameter:

Ø 13 + 0,026 + 0,015 mm

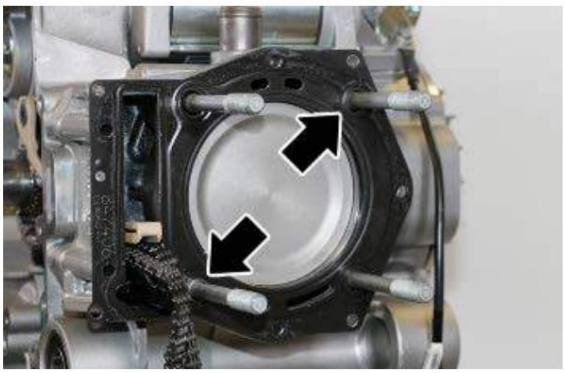
- Check that the contact shoe with the cam and the joint part of the adjusting screws are not damaged show signs of wear.

- If wear is detected, the corresponding component must be replaced.

Installation of cylinder head and valve control components

- Insert the chain guide shoe.
- The centering pins for the cylinder head and cylinder insert.
- Install the cylinder head gasket.

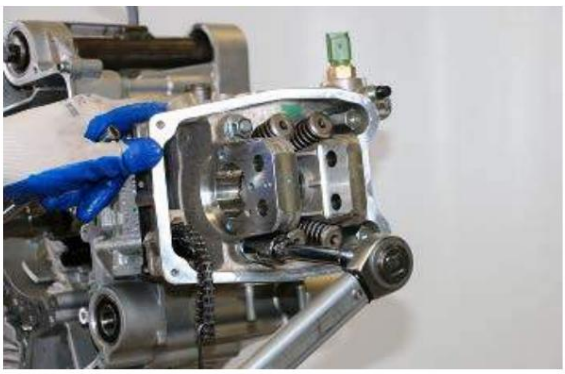
The cylinder head gasket is made of steel and has a Standard thickness.



ANNOTATION

THE PICTURE SHOWS THE INSTALLATION OF THE TWO CENTERING PINS BETWEEN THE CYLINDER HEAD AND THE CYLINDER. THE INSTALLATION POSITION OF THE SEAL IS DETERMINED BY THE TWO CENTERING PINS.

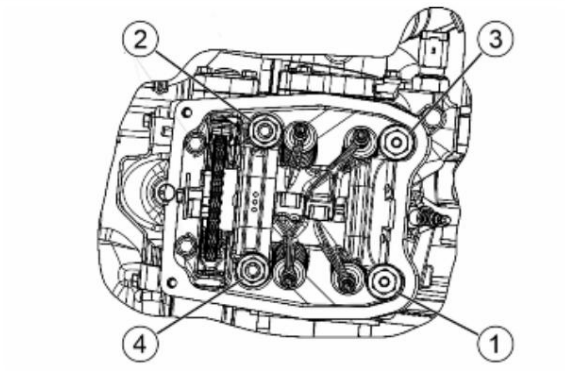
- The cylinder head must be checked before installing whether the lubrication channels are really clean. If necessary, use a jet of compressed air blow.
- Mount the cylinder head.
- Lubricate the four stud screws and the 4 nuts ren.



- Tighten the fixing nuts in a criss-cross sequence as indicated in the figure to the prescribed torque.

Torque guide values (N*m)

Fastening nuts cylinder head - cylinder
13 Nm + 90° + 90°



*** First apply a pre-torque of 13 Nm in a crisscross sequence.

- tighten 90° in a crisscross sequence.

- tighten again by 90° in a crisscross sequence.

- The mounting screws on the inlet side

and on the outlet side with the prescribed

tighten to a certain torque.

Torque guide values (N*m)

Fastening nuts cylinder head exhaust/ Entrance 10 - 12

- The 3 side fastening screws with the

Tighten to specified torque.

Torque guide values (N*m)

Cylinder head fastening screws 10 - 12

- Using a 22 mm wrench, mount the sen

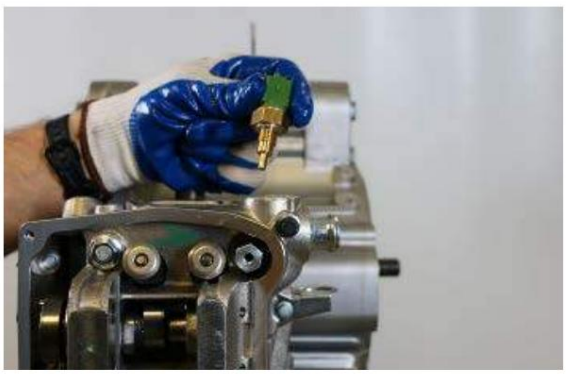
coolant temperature sore with

the relevant washer, locking it to the presc. torque

row.

DANGER

IF THE SPECIFIED TORQUE IS NOT MAINTAINED, THE SENSOR MAY BE DAMAGED.



Torque guide values (N*m)

Sensor coolant temperature - cylinder head 22.0 ± 1.0

- Fit the spark plugs, tightening them to the prescribed torque.

Torque guide values (N*m)

Spark plug 11.0 ± 1.0

- Attach the valve timing chain to the crankshaft

gen. The original direction of rotation of the chain

must be adhered to.

- Insert the chain tension shoe with spacer

put the recommended product on the screw

attach and the fastening screw with the

Tighten to specified torque.

Suggested products

Loctite 243 Medium strength thread locking sealant.

Colour blue

Torque guide values (N*m)

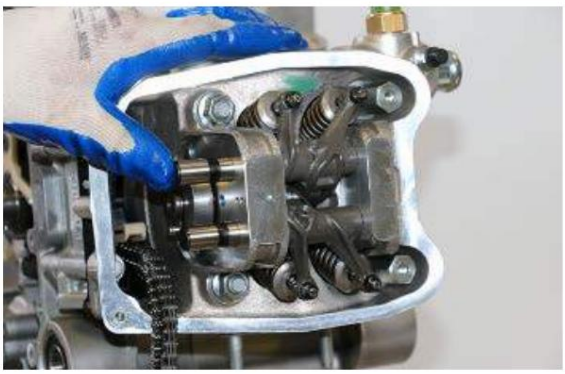
Fastening screw chain tensioner pad
10 - 14

- The rocker arm pins and the rocker arms

Insert from the alternator side.

- The 2 rocker arms through the upper holes

lubricate.



- The camshaft and especially the groove of the

Retaining plate with small bursts of compressed air

nigen.

- Lubricate the 2 running surfaces.

- Insert the camshaft into the cylinder head

zen that the cams are on the opposite side

on the opposite side to the rocker arms.

- Any remaining LOCTITE from the reinforcements

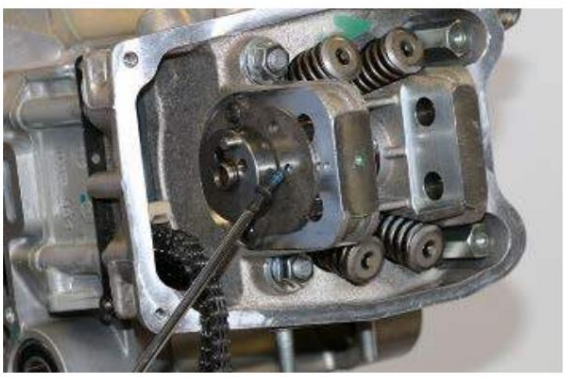
camshaft bracket fixing screws

remove with a brush.

- Attach the recommended product to the fastening screws

and secure them with the specified

Tighten the specified torque.



Suggested products

Loctite 243 Medium strength thread locking sealant.

Colour blue

- Insert the camshaft bracket (the beveled part must be visible) and the 3 fasteners

Tighten the connection screws to the specified torque. Make sure that the Allen key

screw is not damaged.

Torque guide values (N*m)

Camshaft bracket fixing screws: 4 ÷ 6

- The intermediate gear with torque limitation

Zer, the fly magneto and the light

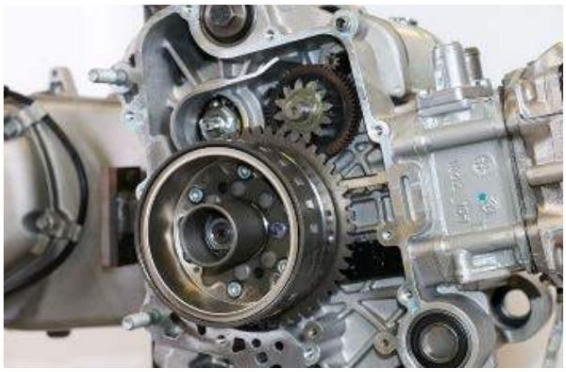
machine cover as in the chapters - Lichtma

engine and starter system and chapter -

Install the alternator cover as described.

ANNOTATION

IT IS EASIER TO INSTALL THE ALTERNATOR COVER WITHOUT THE COOLING SYSTEM HOSES.



- Connect the chain to the valve control sprocket

put on the camshaft.

- The valve timing gear ring on the cams

put on the shaft. The two Marks have to do this

ations remain aligned with one another.

ANNOTATION

WHILE CHECKING THE PHASE ALIGNMENT, THE CHAIN MUST BE KEPT UNDER TENSION BY PRESSURE FROM THE TENSIONER ROOM.

- Use a TORX key to tighten the lock

the inspection opening for phase adjustment

with.

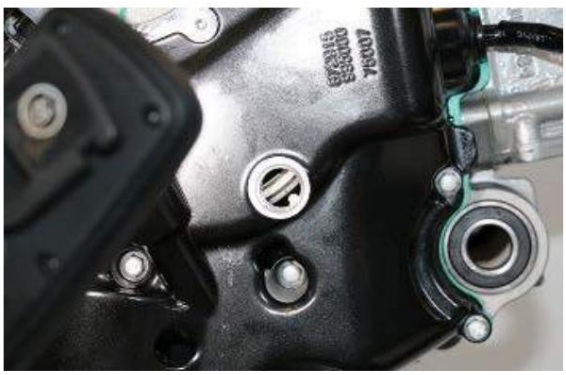
- Keep the chain slightly taut and the crank

Turn the shaft over the drive belt pulley as far as possible

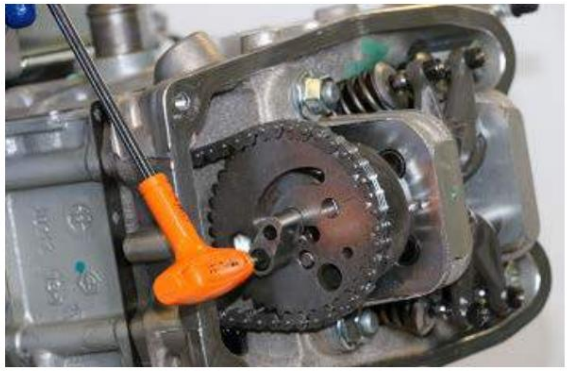
until the mark on the magnet holder

on the marking on the alternator cover

is directed.



- Remove the counterweight.
- With the basket fixing screw in the middle align.
- The fastening screw with the specified tighten to the desired torque. The emp Attach foaled product.



Suggested products

Loctite 243 Medium strength thread locking sealant.

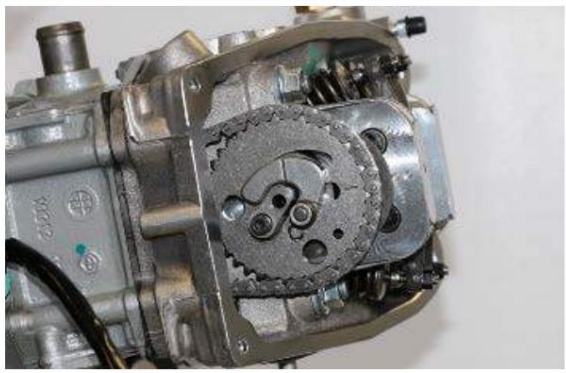
Colour blue

Torque guide values (N*m)

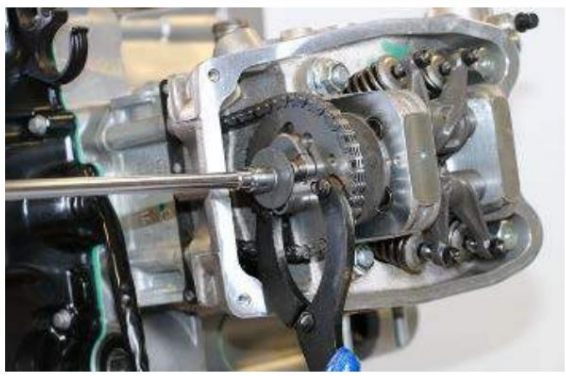
Counterweight screw 7 ÷ 8.5

- Remove the middle screw.
- Install the valve lifter mass. Care must be taken to ensure that the stop ring is correctly positioned is attached.
- Lubricate the valve lifter compound and decompressor control pin.

- Install the return spring and approximately ¾ Tighten one revolution.



- Turn the engine and the marks as in shown in the illustration upwards (end suction phase).
- The valve lifter mass retaining bell set.
- The fastening screw with the specified tighten to the desired torque. The emp Attach foaled product.
- Make sure the valve lifter mass is free and is reset by the return spring.



ANNOTATION

THE ORIENTATION OF THE RESTRAINT BELL IS GIVEN BY THE COUNTERWEIGHT FIXING SCREW.

Special tool

020565Y Face wrench for blocking the alternator

Recommended products

Loctite 243 Medium strength thread locking sealant.

Colour blue

Torque guide values (N*m)

Fastening screws retaining bell
Ventilhebermasse 30 ÷ 35 Nm (22 ÷ 26 lb*ft)

- Set the tensioner rotor to the rest position

position. While doing this, press the retaining bar

hold.

- The tensioning device with a new seal

install on the cylinder.

- The two fastening screws with the attached

Tighten to the specified torque.

Torque guide values (N*m)

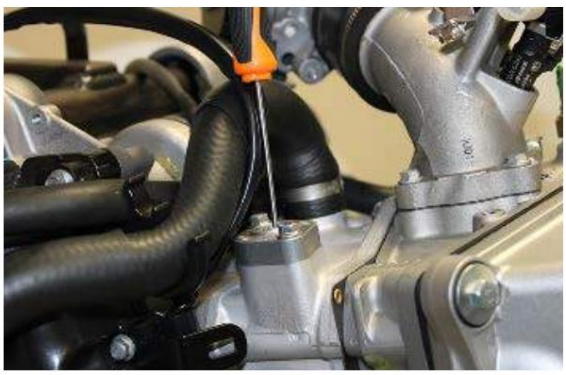
Fixing screws clamping device11 ÷ 13

- The spring with the middle screw and the

Insert washer.

- The middle screw with the prescribed one

Tighten torque.



Torque guide values (N*m)

Chain tensioner screw 5 ÷ 6

- Turn the engine until the valve timing markings line up with the valve setting

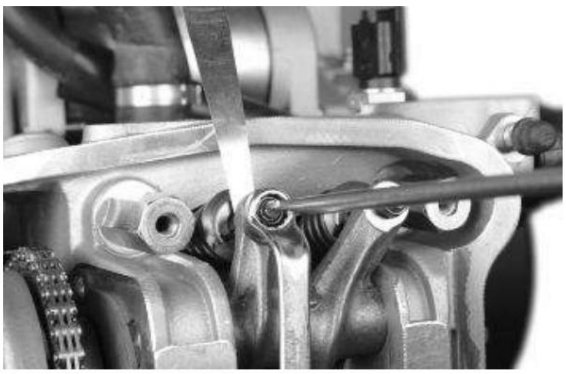
Markings on the cylinder head are aligned.

- Measure the clearance between the valve and the rocker arm using a gauge.

REQUIRED PLAY:

Technical information	Description/Value
inlet	0.15 mm (when engine is cold)
outlet	0.15 mm (when engine is cold)

- If different values are measured, this must be done the valve clearance can be adjusted. In addition, the con Loosen the nut and tighten the adjusting screw with a Adjust screwdriver (see illustration).



Installing the chain and adjusting the valve timing

The ignition timing is advanced (pre-ignition) based on the ignition electronics averaged parameters. For this reason, reference values based on engine speed cannot be used be specified.

The pre-ignition values can be determined at any time using the diagnostic test device.

A stroboscope lamp can be used to check whether the preset specified by the injection system The ignition timing position corresponds to the actual ignition timing on the engine.

Special tool

020922Y Diagnose-Instrument

020330Y Strobe lamp to check the ignition setting

Proceed as follows:

- As described in the “Automatic transmission” chapter remove the drive cover.

- The lock on the inspection opening for the TDC mark between the alternator and the housing Remove the water cover. See chapter “Alternator cover”.

- The motor via the nut on the drive belt

Turn the disc until the two marks

ations for OT are aligned with each other.

- The markings on the drive belt sheave

Align the drive cover and drive cover with each other.

- Reinstall the lock on the inspection opening on the alternator side.

- Connect the diagnostic test device.

- Start the engine.

- Select the «Parameters» function from the menu.

- Set the strobe lamp control to the position of a traditional 4-stroke engine (1 spark

= 2 revolutions).

- The values specified on the diagnostic test device for advancing the ignition timing with the

compare actual values.

Special tool

020922Y Diagnose-Instrument

If the values differ from each other, the following must be checked:

- Ignition adjustment

- Speed phase sensor

- Injection control electronics

Installation of tappet cover

- Check the condition of the seal.

- The valve cover with the specified one
Secure torque.

Torque guide values (N*m)

Valve cover fixing screws 7 ÷ 9 Nm (5.2 ÷ 6.6 lb*ft)

Installation of intake manifold

- Attach the intake manifold to the engine.
- Insert the 3 fastening screws. One
The mounting screws have a fastening
clamp for the cooling line hose. The
Fastening screws with the specified
tighten to a certain torque.

Torque guide values (N*m)

Screws intake manifold 11 ÷ 13

Engine housing and crankshaft

- The outer and inner drive covers and the drive pulley complete, as in chapter
Remove the “automatic transmission” as described.

- The alternator cover with the hoses of the cooling system as described in the chapter «End of the alternator
Remove the lid as described.

- Install the flywheel magneto with starter as described in the “Alternator and starter system” chapter
dismantle the writing.

- The thermal unit (cylinder, cylinder head, piston) as in chapter «Thermal unit and valves Remove the tilt control as described.

- Before separating the housing halves, the axial play of the crankshaft should be checked. For this purpose, a sheet metal (e.g. the special tool) and a holder with a dial gauge (special tool).

Special tool

020262Y Plate for housing separation

020335Y Magnetic holder for dial indicator

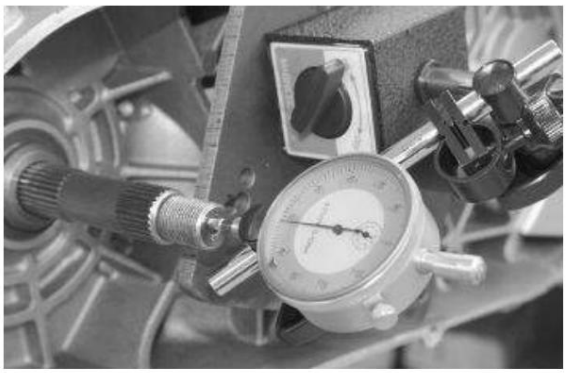
Technical specifications

Standard installation clearance:

0,10 ÷ 0,50 mm

Permissible limit value after use:

0,60 mm



- Larger values are signs of wear on the crankshaft running surfaces on the housing.

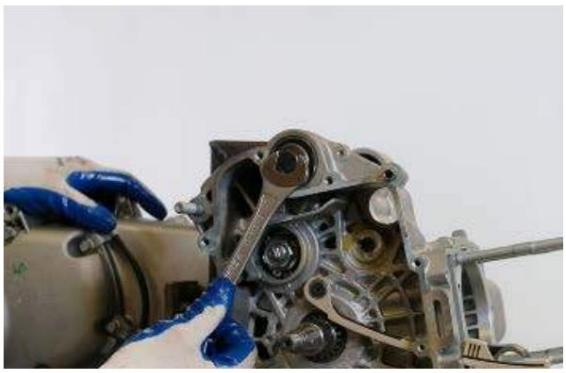
- For correct measurement, the clearance must be adjusted in both directions via the gap between the engine housing and the crankshaft.

Separating the housing halves

- The motor mount mounting screw

on the housing side on the alternator side

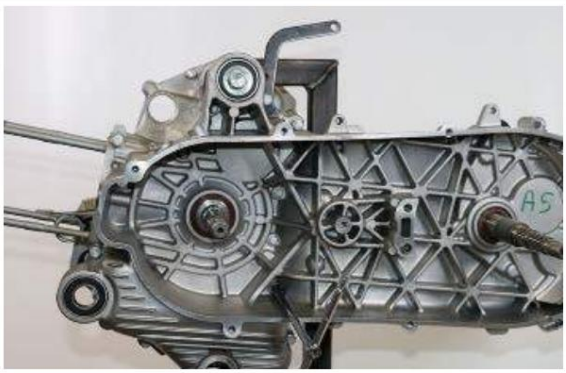
screw off.



- The 14 fastening screws of the housing half unscrew.

ANNOTATION

THE FASTENING SCREWS HAVE 3 DIFFERENT LENGTHS. WRITE DOWN THE INSTALLATION POSITION OF THE INDIVIDUAL SCREWS.



- Separate the housing halves. The must

Crankshaft in the housing half on the light

remain on the machine side.

- Remove the housing gasket.

ANNOTATION

THE LINERS CAN REMAIN IN THE HOUSING HALF ON THE ALTERNATOR SIDE.

Removing the crankshaft

- Before removing the crankshaft, the phase

Alignment with the countershaft checked

become. The crankshaft must be checked for this check

be turned until the two holes

on the crankshaft to the hole on the gear

the countershaft are aligned.

This position is also ideal for expanding the

Crankshaft.

- The crankshaft together with the scraper disc

Remove on the alternator side.

DANGER

WHEN SEPARATING THE HOUSING HALFS AND REMOVAL OF THE CRANKSHAFT, MAKE SURE THAT THE THREADED PART OF THE CRANKSHAFT DOES NOT DAMAGE THE CRANKSHAFT BEARINGS. FAILURE TO COMPLY WITH THIS REGULATION MAY RESULT IN THIS CAUSE THE CRANKSHAFT BEARINGS TO BE DAMAGED.

Removing the countershaft drive gear and oil pump

- To remove the drive gear, you must

4 fastening screws must be loosened.

Only remove the gear if it is loose

thing is required.

DANGER

THE SCREWS ARE COUNTERSUNK HEAD SCREWS WHICH THREADS ARE BLOCKED WITH LOCTITE. ON THAT OH ENSURE THAT THE ALLEN INSERT WILL NOT BE DAMAGED. IF POSSIBLE, USE A SOCKET WRENCH WITH A BUS ATTACHMENT.

Removing the countershaft

- Attach the special tool as shown in the illustration.

Special tool

020479Y Tool for locking the countershaft

- The nut together with the washer

remove.

- Remove the special tool and follow the instructions

laying shaft complete with drive gear

pull.

Replacing countershaft bearings

- The bearings for noise development and above

check moderate play. If necessary

change.

Housing half on alternator side

- Remove the circlip from the inside of the housing

take out the half.

- Turn the housing half over.

- Remove the bearing from the housing half on the alternator side using the specified special tool and remove with a rubber mallet.

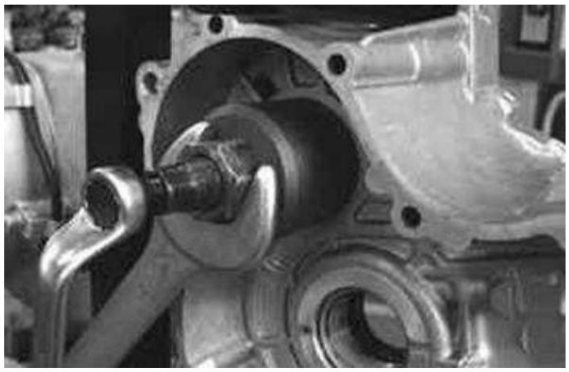
Special tool

020376Y Handle for adapter

020358Y Adapter 37 x40 mm

020439Y Guide 17 mm

- The bearing from the housing half on the drive side Remove with the specified special tool in.



Special tool

001467Y008 Pliers for removing bearings Ø 17 mm

001467Y007 Basket for bearings with external diameter Ø 54 mm

- Before installing a new bearing, the housing must be outer half alternator side with the indicated heated using a special tool.

- Place the housing half on a wooden base only.

Special tool

020151Y hot air gun

- Grease the guide seat and install a new bearing Attach the specified special tool.

- The new bearing in the housing half with the Install the specified special tool.

ANNOTATION

IF A BEARING WITH A PLASTIC CAGE IS INSTALLED, IT MUST BE INSERTED SO THAT THE VISIBLE SIDE WITH THE BALLS SHOWS TOWARDS THE INSIDE OF THE HOUSING.

Special tool

020376Y Handle for adapter

020359Y Adapter 42 x 47 mm

020439Y Guide 17 mm

- Install the circlip.

- Before installing a new bearing in the drive side housing half, the bearing seat must be heated using the specified special tool.

Special tool

020151Y hot air gun

- Grease the guide seat and install a new bearing

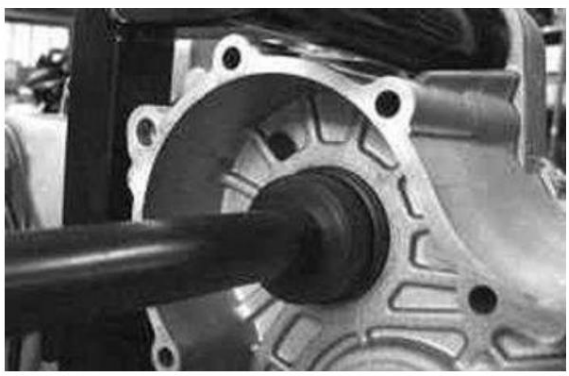
Attach the specified special tool.

- The new bearing in the housing half with the

Install the specified special tool.

ANNOTATION

IF A BEARING WITH A PLASTIC CAGE IS INSTALLED, IT MUST BE INSERTED SO THAT THE VISIBLE SIDE WITH THE BALLS IS TOWARDS THE INSIDE OF THE HOUSING.



Special tool

020376Y Handle for adapter

020359Y Adapter 42 x 47 mm

020439Y Guide 17 mm

Checking the crankshaft components

- Check that the axial and diametric clearances of the connecting rod are within the values reported in the **"Data"** section **technicians".**

- Check that the internal surfaces of the crankshaft shoulders do not have scratches. By means of a gauge, check the overall width of the crankshaft shoulders.

ANNOTATION

WHEN MEASUREMENT, MAKE SURE THAT THE MEASUREMENT RESULTS ARE NOT FALSED BY THE ROUNDED REDUCTION RADIUS WITH THE RUNNING SURFACES OF THE CRANKSHAFT.

Technical specifications

Crankshaft width

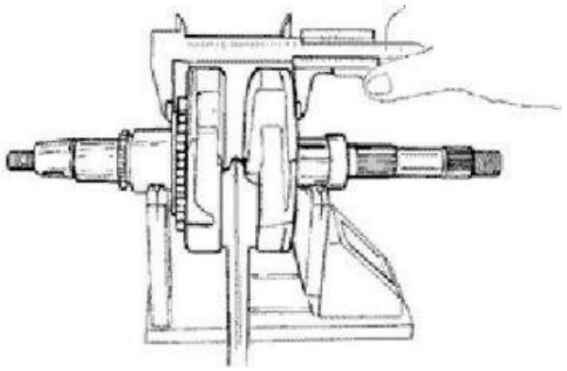
65,45 ÷ 65,6 mm

DANGER

THE CRANKSHAFT CAN BE REUSED IF THE WIDTH MATCHES STANDARD VALUES AND THE SURFACES ARE NOT SCRATCHED.

Rasamento

- Check the overall dimension of the crankshaft-shim-gear assembly.



Technical specifications

Standard size

XXX ÷ XXX mm

- Check that the scraper disk is not scratched.

ANNOTATION

IF REUSED, KEEP THE ORIGINAL INSTALLATION POSITION.

Special tool

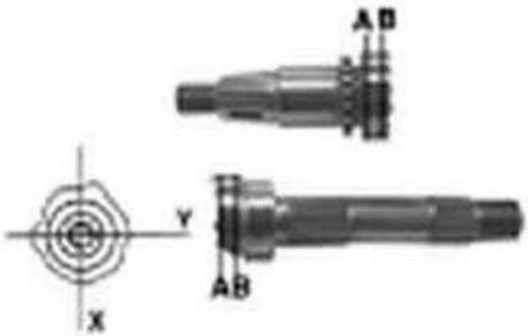
020074Y Holding device for checking crankshaft alignment

- Is the axial play between the crankshaft and the engine housing larger than the normal values, but the crankshaft knows If there are no abnormalities, the problem is certainly due to wear or incorrect processing on the engine housing.

- Check, according to the axes and planes indicated in figure, that the diameters of both flow rates of the the crankshaft falls within the values reported in the "Technical Data" section .

- The half-shafts are classified into two categories: "Class 1" and "Class 2" and the diameters of the flow rates are shown in the Car coupling table

ter - Crankshaft - Main bearing halves.



DANGER

If anomalies or values that do not comply with those specified are found, proceed with replacing the complete crankshaft.

Check alignment of the crankshaft

- Install the crankshaft on the special bracket and check that the eccentricity values are in are within the values specified in the **“Technical data”** section .

Special tool

020074Y Holding device for checking crankshaft alignment

- The condition of the crankshaft cone, the locking tongue seat, the running surface of the oil seal, the

Check the grooved part and the threaded end parts.

- If there are any abnormalities, the crankshaft must be replaced.

ANNOTATION

THE CRANKSHAFT BEARING RUNNING SURFACES CANNOT BE GRINDED.

The connecting rod cannot be replaced. For checking the diameter of the connecting rod head

see chapter “Thermal unit and valve control”.

- When cleaning the crankshaft, make sure that no dirt gets into the lubrication openings

reaches the crankshaft.

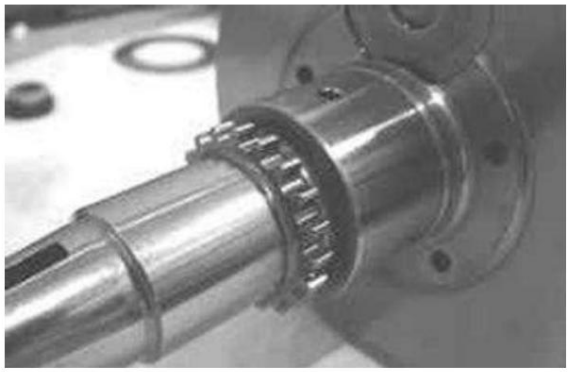
ANNOTATION

WHEN REPLACING A CRANKSHAFT COMPOSED OF HALF-SHAFTS OF DIFFERENT CATEGORY, THE TWO HOUSING HALVES MUST ALSO BE REPLACED AND THEN COMPONENTS OF THE SAME CATEGORY (CRANKSHAFT AND
HOUSING) TO BE INSTALLED.

- For checking the gear on the crank

wave see chapter «Thermal unit and vein

Tile control».



Check the motor housing halves

- Before checking the housing halves

all surfaces and lubrication lines thoroughly

getting cleaned.

- On the housing half on the drive side

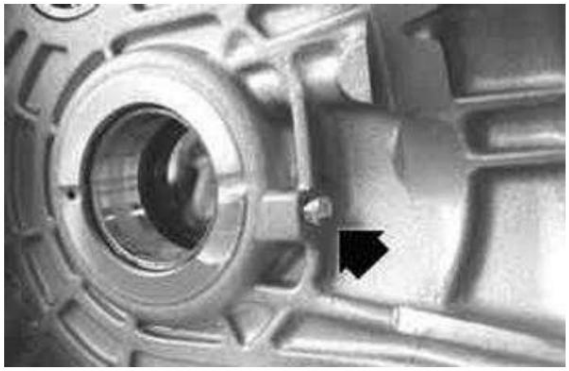
Pay particular attention to the crankshaft bearings

Cooling nozzle on the drive side (see illustration)

and pay attention to the lubrication line.

ANNOTATION

THE NOZZLE IS SUPPLIED VIA THE CRANKSHAFT BEARINGS. A GOOD FUNCTIONING OF THIS COMPONENT IMPROVES PISTON BOTTOM COOLING. IS IF THIS NOZZLE IS CLOGGED, IT WILL CAUSE EFFECTS THAT ARE DIFFICULT TO DETECT (RISE IN TEMPERATURE ON THE PISTON). IF THE NOZZLE IS MISSING, OR IF IT FALLS OUT, THE LUBRICANT PRESSURE ON THE CRANKSHAFT BEARING AND ON THE CONNECTING PLEU DRASTICALLY DROPS.



- On the housing half on the alternator

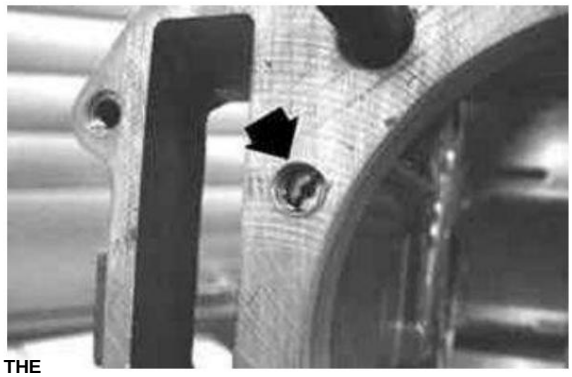
Page must pay particular attention to the lubrication lines

the crankshaft bearing, the pump room and

the lines to the pump and on the lines

Pay attention to the by-pass on the alternator cover

become.



ANNOTATION

AS ALREADY DESCRIBED IN THE LUBRICATION SYSTEM CHAPTER, IT IS PARTICULARLY IMPORTANT THAT THE SEAT OF THE BY-PASS ON THE ALTERNATOR COVER SHOWS NO SYMPTOMS OF WEAR THAT COULD AFFECT THE SEALING OF THE PISTON FOR LUBRICATION PRESSURE REGULATION. THE LUBRICATION CHANNEL FOR THE CYLINDER HEAD IS WITH A THROTTLE NOZZLE EQUIPPED. THIS NOZZLE TAKES CARE FOR LOW-PRESSURE LUBRICATION OF THE CYLINDER HEAD. THIS CHOICE WAS MADE TO KEEP THE OIL TEMPERATURE IN THE PAN LOW.

Clogging of this nozzle impairs the lubrication of the cylinder head and the components

Valve control.

A missing nozzle leads to a drop in the lubricating pressure on the crankshaft bearings and on

connecting rod.

- Check the mating surfaces of the housing halves and cylinder housings for dents or deformations

fen.

- Any damage to the housing seal or mating surfaces (see installation with alternator cover) can lead to a loss of oil under

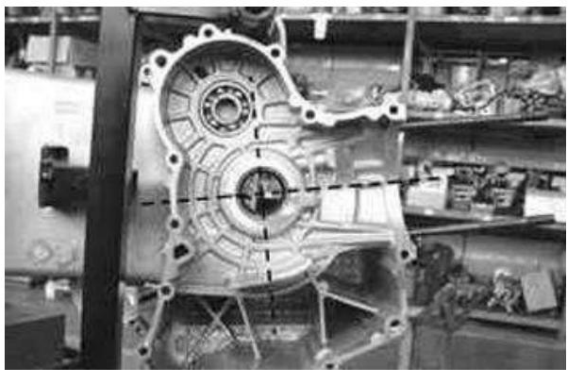
pressure and thus the lubricating pressure on the

Affect crankshaft bearings and connecting rod.

- Check the running surfaces for wear to limit the axial play. For the measurements

The values for axial play and dimensions on the crankshaft apply.

Checking the crankshaft bearings



- To ensure good lubrication of the crankshaft bearings To achieve this, both the lubricating pressure (4 bar) must be optimally adjusted and a sufficient oil supply must be guaranteed. In that together It is also important that the crankshaft bearings are installed correctly and no Throttle lubrication channels.

- The crankshaft bearings consist of 2 half shells len, of which 1 is solid and 1 with holes and Grooves for lubrication.

- The massive half bearing must absorb and contain the pressure resulting from combustion therefore opposite the cylinder.

- To ensure that the lubrication channels are not throttled, the mating surface of the two half bearings must be aligned exactly perpendicular to the cylinder axis (see illustration).

- The cross section of the lubrication channels is also related to the installation depth of the crankshaft bearings on the plane to limit the axial play of the crankshaft.

ANNOTATION

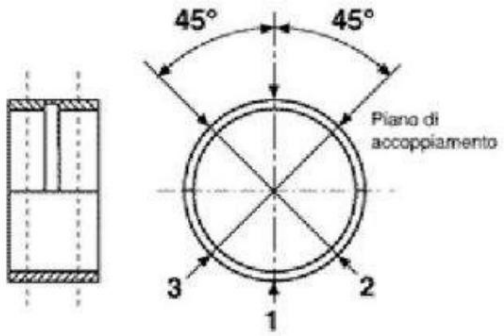
SO THAT THE CRANKSHAFT BEARINGS MAINTAIN THIS INSTALLATION POSITION, THIS IS DONE INSTALLATION BY PRESSING INTO THE CAST IRON RINGS IN BOTH HALF OF THE HOUSING ARE ALLOWED.

- The diameter of the crankshaft bearings three directions shown in the figure check.

- Also the diameter of the other crank Check shaft bearing half. See illustration.

ANNOTATION

DO NOT MATCH THE DIAMETER ON THE MATCHING SURFACES OF THE MEASURE 2 BEARING HALFS AS THESE ARE FOR THE BETTER ARE SANDED FOR INSTALLATION.



- Before assembling, check whether there is clearance between the bearing bushes of the housing and the Crankshaft are within the values specified in the **"Technical Data"** section.

- The standard diameter of the crankshaft bearings is depending on the installation category selected different.

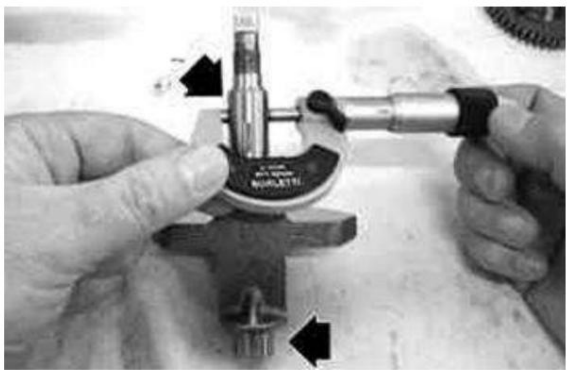
- The bearing seats of the crankshaft bearings are divided into 3 categories and the crankshaft into 2 categories Splits.

- The bearing bushes are divided into 4 categories depending on their thickness (see table in Fig section **"Technical data")..**

countershaft

- Using a micrometer, check the 2 running surfaces of the front

Measure layshaft (see illustration).



Technical specifications

Standard diameter:

17 - 0,01 - 0,02 mm

- Check that the water pump driver shows no signs of wear.

Installation of crankshaft

- Check that the drive gear of the countershaft and oil pump is not damaged or damaged

is formed. Replace if necessary.

ANNOTATION

IF THE COUNTERSHAFT DRIVE GEAR AND OIL PUMP IS REPLACED, THE COUNTERSHAFT GEAR MUST ALSO BE REPLACED.

- Before installing the gear on the crankshaft

The mating surfaces must be carefully cleaned and

Remove LOCTITE residue from the holes with a brush

removed.

Blow through the mounting holes on both surfaces with compressed air and degrease so that the

new LOCTITE finds support.

Attach the recommended product to the holes again.

Recommended products

Loctite 243 Medium strength thread locking sealant.

Colour blue

- Repeat the same steps on the 4 fastening screws.

- Place the drive gear on the crankshaft. The bevel with the holes must be visible

be cash.

- Tighten the 4 fastening screws to the specified torque.

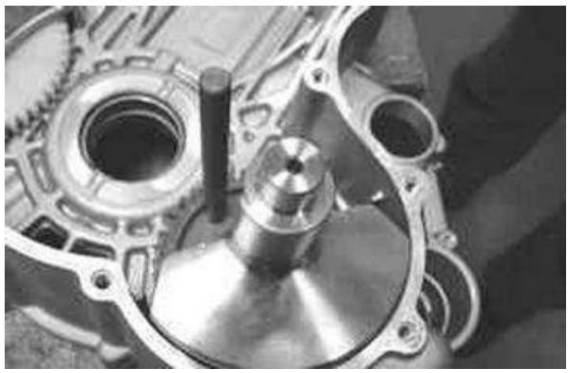
ANNOTATION

BE CAREFUL NOT TO DAMAGE THE ALLEN INSERT. IF POSSIBLE, USE A SOCKET WITH A SOCKET ATTACHMENT.

Torque guide values (N*m)

Fastening screws gear to crankshaft 10 -12

- The crankshaft bearing on the housing half
Lubricate alternator side.
- Grease the compensating disk.
- The crankshaft and the balance disk in
Insert original position.
- Insert a bolt with an 8 mm diameter into the opening
Insert voltage on the countershaft.



- Place the crankshaft on the mandrel (carefully done).
hen) and then into the crankshaft bearing
insert.
- Before the crankshaft is fully inserted
the gears of the oil pump and that
Drive gear aligned with each other
the.
- Finish inserting and remove the bolt.

ANNOTATION

WHEN INSERTING THE CRANKSHAFT INTO THE HOUSING HALF, MAKE SURE THAT THE THREADED PART OF THE CRANKSHAFT AND THE VALVE TIMING PINION THE CRANKSHAFT BEARINGS NOT DAMAGED.

- Insert the partition wall to the oil pump room.
- The 2 flanged screws with the provided
Tighten the specified torque.

Torque guide values (N*m)

Screws for oil pump compartment partition wall 8 - 10

Assembling the case

- Put the shaft seal on the housing half

Remove drive side with a screwdriver.

- Lubricate and add a new shaft seal

Install using the specified special tool.

The shaft seal must be 0.5 mm below the Ge

house surface can be used.

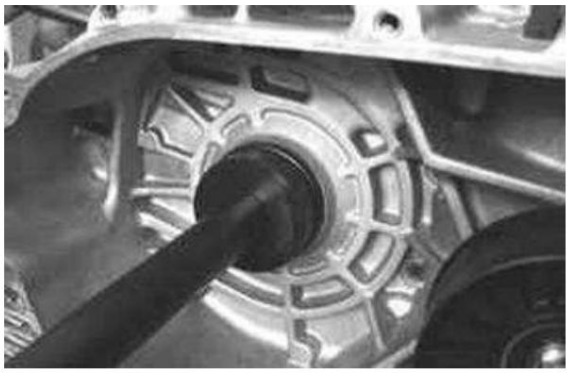
DANGER

INCORRECT INSTALLATION DEPTH OF THE SHAFT SEAL AFFECTS THE CIRCULATION OF THE LUBRICANT OIL.

Special tool

020360Y Adapter 52 x 55 mm

020376Y Handle for adapter



- The seal on the housing half of the alternator

put on the inside.

- The crankshaft bearing on the housing half

Lubricate drive side.

- Put the two housing halves together

Zen. Make sure that this is the case

Crankshaft bearing on the housing half

drive side not through the threaded part of the

Crankshaft is damaged.

- The motor mount mounting screw

on the alternator side housing half

put but do not tighten yet.

- The 14 fastening screws according to the

Use the position noted when dismantling.

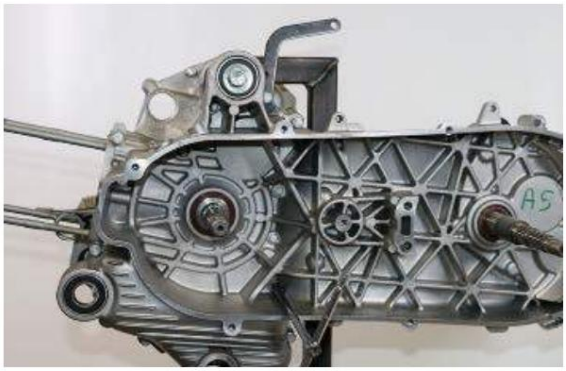
- Tighten the screws until they stop and

then with the prescribed torque

tighten.

- Check whether the crankshaft rotates easily

leaves.



ANNOTATION

**TO ENSURE A BETTER SEAL,
ANY PROJECTING SEAL PARTS MAY NEED TO BE REMOVED
BETWEEN ENGINE HOUSING AND CYLINDER.**

Torque guide values (N*m)

Motor case connecting screws 11 ÷ 13

- The thermal unit (cylinder, cylinder head, piston) as in chapter «Thermal unit and valves

Install the tilt control as described.

- Install the flywheel magneto with starter as described in the “Alternator and starter system” chapter

install writing.

- The alternator cover with the hoses of the cooling system as described in the chapter «End of the alternator

Install the lid as described.

- The complete drive pulley, the outer drive cover and the drive cover, complete

Install with line filter as described in the “Automatic transmission” chapter.

lubrication

TECHNICAL SPECIFICATIONS

OIL PAN CAPACITY

Technical information	Description/Value
Revision	1,7 Liter
Engine oil and filter change	1,5 Liter

RECOMMENDED ENGINE OIL

Product	Description	Declarations
Engine oil 5W-40	Synthetic-based lubricant for The 4-Stroke Engine.	SAE 5W-40; JASO MA, MA2; API SL; THAT A3

OIL PUMP

Technical information	Description/Value
Type	Trochoidal
Rotor strength	8 mm
Built-in games	Wing end parts 0.05÷0.008 mm
Radial play of outer rotor	0,05 ÷ 0,12 mm
Axial play of the rotors	0,025÷0,065 mm

BY-PASS

Technical information	Description/Value
Type	With piston
Piston diameter	Ø 13,9 -0,039 -0,057 mm
Free spring length	62,5 mm
Calibration pressure	4 bar

FORFILTER

Technical information	Description/Value
Type	With plastic net

OIL FILTER

Technical information	Description/Value
Type	Paper with bypass pressure relief and shut-off

MINIMUM OIL PRESSURE INDICATOR

Technical information	Description/Value
calibration	0,3 ÷ 0,6 bar

CYLINDER HEAD LUBRICATION NOZZLE

Technical information	Description/Value
diameter	Ø 1 ± 0,05 mm *

* ***Tightening torque*** *5÷7 N m*

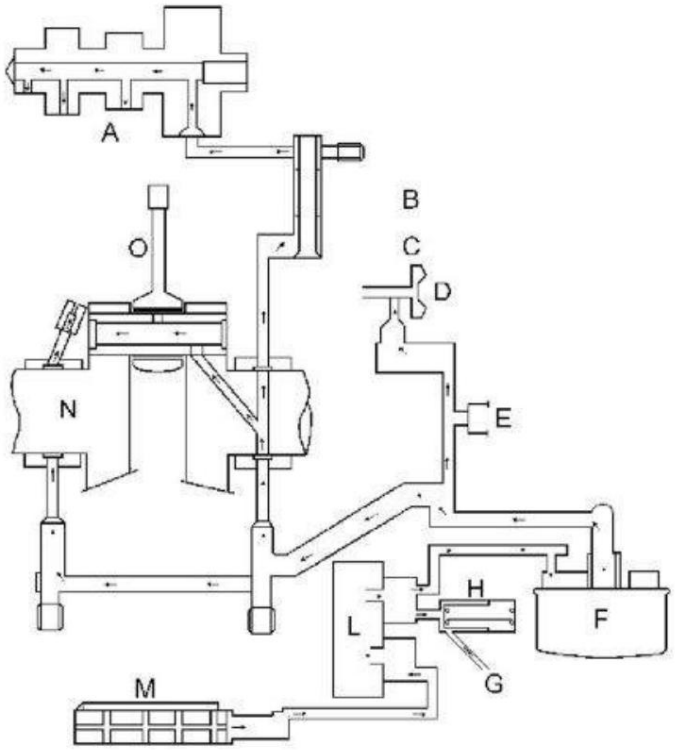
COOLING NOZZLE PISTON LUBRICATION

Technical information	Description/Value
diameter	Ø 0,8 ± 0,05 mm

OIL PAN BREATHER

Technical information	Description/Value
contraption	Metal reed valve and decanter chamber

Schematic circuit diagram



SCHEMATIC CIRCUIT DIAGRAM

Technical information	Description/Value
A	camshaft
B	Cylinder - cylinder head mating surface
C	Cylinder - housing mating surface
D	Impeller water pump
AND	Oil pressure sensor
F	Oil filter cartridge
G	To the oil pan
H	By-Pass Ventil
L	Oil pump
M	Mains pre-filter
N	crankshaft
O	connecting rod

General technical information

The lubrication system is divided into two areas:

- High pressure

- Low pressure

All components on the engine housing belong to the high pressure area. The low pressure area only concerns the thermal unit.

The trochoid pump is installed in the oil pan and is driven by a pair of gears.

To avoid damage to the pump, a pre-filter is used.

The pre-filter is removable and the associated screw plug is also the drain plug the engine oil.

The supply line to the pump is connected through a by-pass with a piston to regulate the pressure to 4 bar controlled. The by-pass is installed in front of the filter cartridge. Both parts are located on the Lichtma rail cover. The filter seal is therefore exposed to the same pressure as the lubricating pressure.
The by-pass installed in front of the filter cartridge particularly improves the working conditions of the filter This is the case with cold oil.

The filter is equipped with a drain protection valve and a pressure relief valve. The above pressure valve is triggered when the filter mass causes a pressure drop of more than 1 ± 0.2 bar.
Of course, this condition only occurs when the oil is cold and at high engine speeds or when the engine is dirty Filter reached.

The filtered engine oil is used to lubricate the water pump shaft. After it's the engine Once it has reached the housing, it is used to lubricate the crankshaft bearings, the connecting rod base and the cooling nozzle of the piston, which is located on the running surface on the drive side.
The running surface of the crankshaft bearing has a shaft seal and an oil return line.
The supply line to the valve control branches off from the running surface on the alternator side.
The supply line to the cylinder head is controlled by the nozzle screwed into the engine housing.
The valve control components are lubricated with low pressure.
The running surfaces of the camshaft are machined directly from the aluminum of the cylinder head.
The axial play of the camshaft is partly due to the smaller diameter running surface routed lubricating oil balanced.
The rocker arms are lubricated via corresponding lubrication holes on the camshaft.
These lubrication holes are installed in such a way that lubrication continues even after the vehicle is parked stuff is ensured. This result is achieved by the camshaft position, which the shaft with is most likely to occur when the engine is switched off.
The oil used to lubricate the cylinder head is transported through a channel through the chain space returned to the oil pan, where it also lubricates the chain.
In order to avoid that the oil vapors returned from the oil pan transport quantities of oil,
A check valve and a decanter chamber are used. The check valve is a metal reed valve. The Decanter chamber has a drain opening. If the drain opening is clogged, oil can get into the intake reach.
Excessive amounts of oil vapor can clog the lines on the throttle housing.
An oil pressure switch is used to indicate when the minimum oil pressure has been reached. This oil pressure The switch is located directly behind the filter outlet.
The lubrication circuit does not affect the countershaft. The countershaft is lubricated by the oil transported by the gears or the oil transported by the centrifugal force from the crank wave drips.
The same applies to the piston and the piston pin, although in this case the cooling nozzle is one plays a special role.

Troubleshooting

1 - The oil pressure control switches on when the engine is warm.

CONTINUE - point 2

2 - Disconnect the cable connector from the oil pressure switch.

Check whether the oil pressure control switches off.

YES point 3 NO point 11

3 - Check actual oil pressure.

CONTINUE - point 4

4 - Remove the oil pressure switch and use the specified special tool together with the included

Attach the corresponding seal.

Special tool

020193Y Pressure gauge for oil pressure control

020434Y Connection for oil pressure control

- Remove the filler plug with dipstick and use one for the temperature sensor

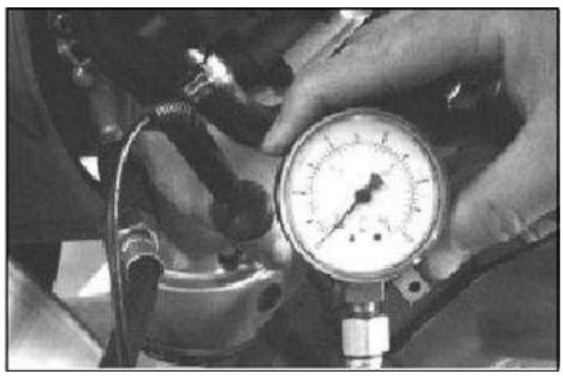
Attach the fastener prepared using a special tool. Insert the probe until it comes into contact with

If you notice it on the bottom of the case, then move it back a few millimeters.

Special tool

020331Y Digital Multimeter

CONTINUE - point 5



5 - Measure the oil pressure with the engine cold and idling.

DEFAULT VALUES

Technical information	Description/Value
20°C temperature	
1400 U/Min	

~ 4,5 bar

ANNOTATION

THE SPEED CAN BE DETERMINED BOTH VIA THE EMISSION MEASUREMENT DEVICE AND VIA THE DI AGNOSES TEST DEVICE TO BE MEASURED

Special tool

020922Y Diagnose-Instrument

YES point 6 NO point 12

6 - Warm up the engine and repeat the oil pressure check when the engine is warm.

DEFAULT VALUES

Technical information	Description/Value
80°C temperature	
1400 U/Min	
~ 1,5 bar	

YES point 7 NO point 8

7 - Replace the oil pressure switch.

8 - An oil pressure of less than 1.3 ÷ 1.5 bar is measured.

CONTINUE point 9

9 - Change the oil filter and repeat the oil pressure check at a temperature of 80°C.

YES point 10 NO point 13

10 - The error is fixed.

Point out compliance with maintenance intervals.

11 - Check and repair the electrical system.

12 - An oil pressure of less than 4 bar is measured.

CONTINUE point 9

13 - Remove the alternator cover and check the function of the by-pass and the gasket

check exterior. Proceed as described in the alternator cover chapter.

YES point 14 NO point 15

14 - Check the crankshaft for excessive play:

- Axial play (see engine housing and crankshaft chapter)

- Radial play, especially towards the cylinder axis

- Play in direction of rotation with balanced connecting rod

YES point 16 NO point 17

15 - Replace the damaged components (alternator cover chapter).

16 - Carry out an engine overhaul (chapter engine housing and crankshaft).

17 - Open the engine case and remove the oil pump. As in chapter engine housing and crank

proceed as indicated on the shaft.

- Check the oil pump as described below.

- Check the correct installation of the cooling nozzle and the valve control supply nozzle.

- Carry out a visual and measuring check of the fitting clearances on the crankshaft (chapter engine housing

and crankshaft).

ANNOTATION

ERRORS IN THE FITTING CLEARANCES AND VALVE CONTROL COMPONENTS CANNOT BE DETECTED BY CHECKING THE OIL PRESSURE. THESE CAN BE NOTIFIED BY INCREASED NOISE.

ANNOTATION

IF THERE IS ANY DEVIATION FROM THE PRESCRIBED OIL PRESSURE IN THE OIL PAN, A VISUAL AND MEASUREMENT CHECK OF THE VALVE CONTROL COMPONENTS SHOULD BE CARRIED OUT (SEE CHAPTER THERMAL UNIT AND VALVE CONTROL).

Oil pressure control

1 - If oil leaks from the seal on the alternator cover or the oil filter, the lubrication pressure must be increased

being checked.

CONTINUE point 2

2 - Install the special tool.

Special tool

020193Y Pressure gauge for oil pressure control

020434Y Connection for oil pressure control

CONTINUE point 3

3 - Check the oil pressure with the engine cold and at medium and high speeds.

Standard pressure < 6 bar

YES - point 4 NO point 5

4 - Replace the damaged components.

5 - Check the function of the by-pass oil pressure control (see chapter alternator cover) and set it to run correctly again.

ANNOTATION

THE STANDARD OIL PRESSURE VALUES ARE OBTAINED WHEN AN ENGINE OIL OF THE DESIGNED VISCOSITY IS USED. WITH HIGHER VISCOSITY, THE OIL PRESSURE IN THE SYSTEM INCREASES.

1 - If the oil consumption is over 250 g/1000 km when the engine is running in, proceed as follows

become.

CONTINUE point 2

2 - Check if there is oil in the return line on the filter housing.

YES point 3 NO point 4

3 - Check the check valve (reed valve) and the drain opening on the decanter chamber.

YES point 5 NO point 4

4 - Check the thermal unit seals (piston rings, valve guides and oil seals),

see chapter Thermal unit and valve control.

5 - Repair the check valve or expose the drain hole.

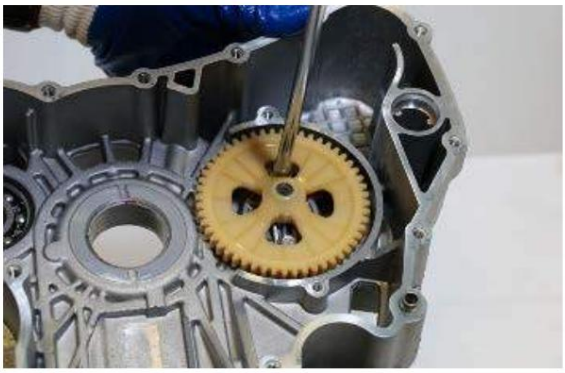
Oil pump

expansion

- The 2 fastening screws together with the Remove the associated washers and remove the partition wall to the oil pump room.

- Check the oil pump mounting screws Unscrew the eyelets on the gearbox.

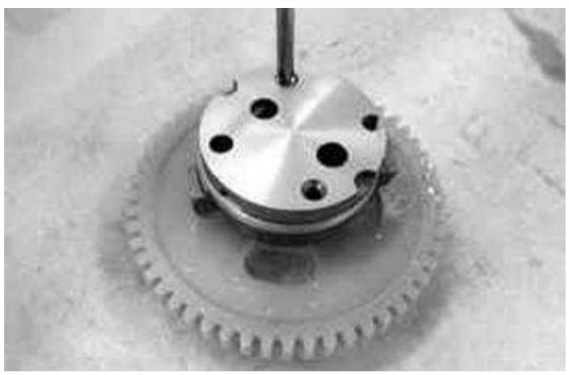
2 screws



- The oil pump complete with gear and seal Remove

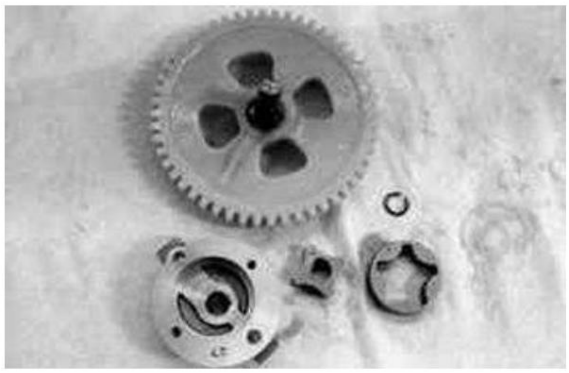
- The two screws and the oil cap

remove pump.

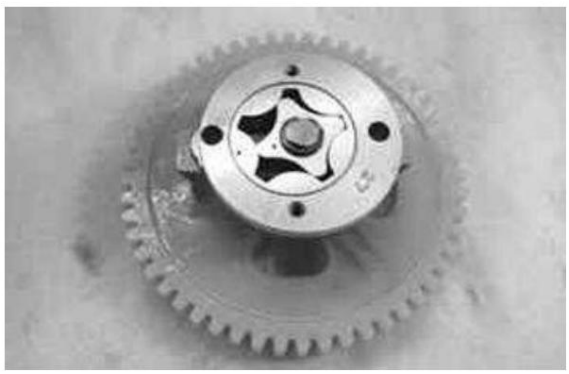


- Turn the snap ring of the inner rotor until the opening is on the joint of the oil pump shaft and can be removed.

- Remove the wheels and thoroughly with Ben Clean zinc and compressed air.
- The oil pump shaft complete with gear build. The condition of the shaft and wear check.



- Put the impellers back into the pump housing install. The two markers must remain visible.
- Insert the oil pump shaft with gear Attach the snap ring and the opening on the dem Rotate the grinding side on the opposite side.
- Check for excessive play between the oil pump shaft and check pump housing.



- Use a blade gauge to measure the distance between the rotors Measure the position specified (see fig content).

Technical specifications

Max. allowable clearance:

0,012 mm

- The distance between the outer rotor and the pump

Measure the pen housing (see illustration).

Technical specifications

Max. allowable clearance:

0,25 mm

- The axial play of the rotors with a ground

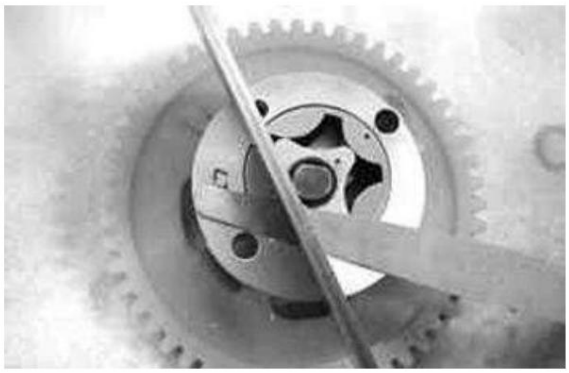
a measuring stick as a reference plane as in the figure

Check the information shown.

Technical specifications

Permissible limit:

0,1 mm



Installation

- Make sure the seal is correctly attached

is brought.

ANNOTATION

THE GASKET GEARS MUST BE FITTED IN THE APPROPRIATE SEAT.

- Lubricate the internal rotors.

- Check that the pump cover is not off

used or scratched.

- Are different values measured or

Scratches or wear are found, the

Pump needs to be replaced.

- Attach the pump cover so that the drill

The rungs for attaching the fastening screws to the

housing are aligned with one another.

- Tighten the two fastening screws to the specified

torque.

Torque guide values (N*m)

Oil pump cover screws 0.7 ÷ 0.9

- Insert the oil pump complete with gear.

- Insert the 2 screws through the slotted holes on the gear and with the prescribed rotation

tighten moment

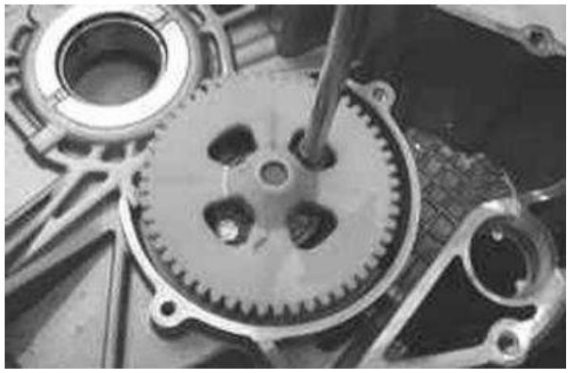
ANNOTATION

THE OIL PUMP INSTALLATION IS DONE BY INSTALLING THE SCREWS SPECIFIED.

If the specified torque is not set

hold, this can affect the passing clearance of the rotors

change the pump housing.



Torque guide values (N*m)

Oil pump fastening screws to the housing
with 5 ÷ 6

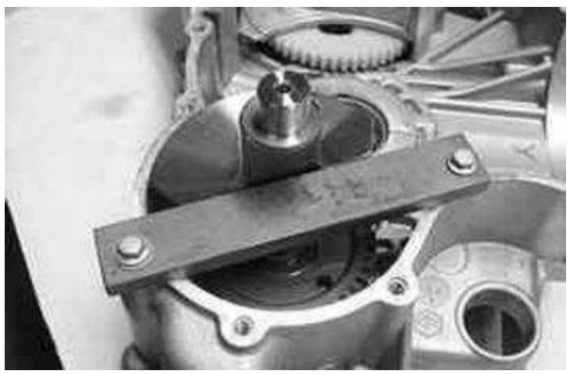
- The countershaft together with the gear

into the housing half on the alternator side

insert.

- The special tool as shown in the picture

shows attach.



Special tool

020479Y Tool for locking the countershaft

- Hold the countershaft in position and

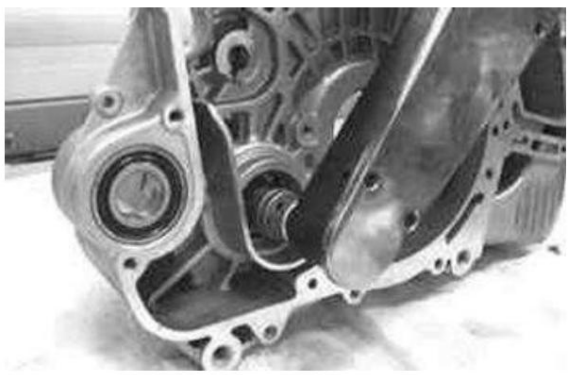
insert the nut and washer.

- The nut with the prescribed torque

ment tighten. The recommended product

attach.

- Remove the special tool.



Suggested products

Loctite 243 Medium strength thread locking sealant.

Colour blue

Torque guide values (N*m)

Countershaft fixing nut 25 ÷ 29

water pump

expansion

Special tool

020661Y Kit for replacing the integral seal of the water pump

- Using a screwdriver, remove the six

Remove screws and the pump cover.

- With an 8mm wrench, the impeller of the Was

Unscrew the water pump.

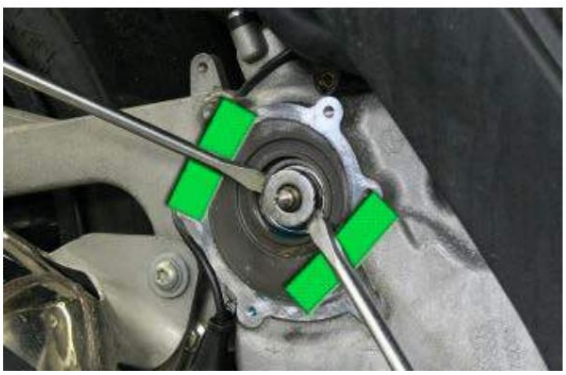
- Use two flat head screwdrivers. The

screwdriver as shown in the illustration

put so that it can be levered on the edge of the housing

the can, and the integral seal that is on the

If the impeller shaft is pressed on, destroy it.



DANGER

FOR PROTECTION, APPLY TEFLON TAPE AS SHOWN IN THE PICTURE TO COVER THE SEALING SURFACE DO NOT DAMAGE WATER PUMP COVER.
POSSIBLE SMALL IMPRINTS ON THE EDGE OF THE SUPPORT WILL NOT CAUSE MALFUNCTION.

- If necessary, the position of the screw

change here.

- When dismantling the seal it can happen

that the ceramic breaks.

- Clean all parts thoroughly before pulling out.

- The puller complete with pin on the static

Attach part of the ceramic seal.

- Without changing the position of the puller, with

the pin and a hammer three holes on the sta

Attach the table part of the seal.

ANNOTATION

THE HOLES MUST BE MADE WITH A STRONG PUNCH.

LIGHT AND REPEATED IMPACT MAY CAUSE DEFORMATION WITHOUT MAKING HOLES.

- The puller with the screw included in the tool on the static

part of the seal

attach.

DANGER

THE TOOL MUST BE WELL FIXED, WITHOUT TO “TEAR” THE SHEET.

- Complete the tool by installing the bracket, screw and nut.

- Hold the screw firmly and the nut as far as possible rotate until the static part of the seal is full constantly moved out.
- The puller complete with the static part remove the ceramic seal.

Installation

Special tool

020661Y Kit for replacing the integral seal of the water pump

PRESSING IN THE INTEGRAL SEAL

DANGER

CLEAN ALL COMPONENTS THOROUGHLY.

DANGER

LUBRICATE THE IMPELLER SHAFT WITH ENGINE OIL.

- Screw the threaded bolt onto the impeller shaft.

DANGER

SCREW IN MANUALLY UNTIL THE STOP.

- Attach the integral seal to the shaft.

- Attach the calibrated striking mandrel (with preload measurement).
- Attach the nut to the threaded bolt.
- Hold the threaded bolt firmly and tighten the nut screw tight until it stops.
- The tool is used to press the static seat into the housing and the movable seat onto the shaft and at the same time the ceramic seal correctly pre-tensioned.

- Screw the impeller tight.

Torque guide values (N*m)

Water pump impeller 4 ÷ 5

- Install the pump cover with a new gasket. The seal must be lubricated with Vaseline grease before installation.
- Attach the six screws to the cover and Tighten to the specified torque hen.

ANNOTATION

TO AVOID DEFORMATION, DO NOT LUBRICATE THE O-RING WITH MINERAL GREASE.

Torque guide values (N*m)

Water pump cover screws 3 ÷ 4

Reverse gear

REVERSE GEAR ADJUSTMENT ASSEMBLY

To remove the group of the adjusting device Reverse gear, the screws of the protection Remove the direction of the drive cover (4 screws ben).

The drive cover protection device is removed distant.

To make it easier to get to the components, at Be the fastenings of the filter housing (2 Remove screws) and lift it slightly.

The coil is mounted in the middle part of the drive which controls the engagement of reverse gear are.

In addition, the linear sensor is present, which... Position of the lever for insertion is determined and activates reverse gear.

The screw on the wiring retaining plate unscrew and remove this.

The fastenings of the assembly of the Stellvor Remove direction of reverse gear (3 screws).

Disconnect the cable connector and the assembly remove.

DANGER

WARNING

TO EXPOSE THE CABLE CONNECTOR ATTACHMENT TOOTH, PRESS IT AS SHOWN IN THE PHOTO.

At the top left is the contact housing of the Pluska attached to the engine for reverse gear.

REMOVAL OF ENGINE AND REVERSE GEARS

Unscrew the nuts of the retaining plate, this one

Remove and the positive cable of the motor for the

Release reverse gear.

Use a screwdriver to open the closure

the axis of the guided pulley

with.

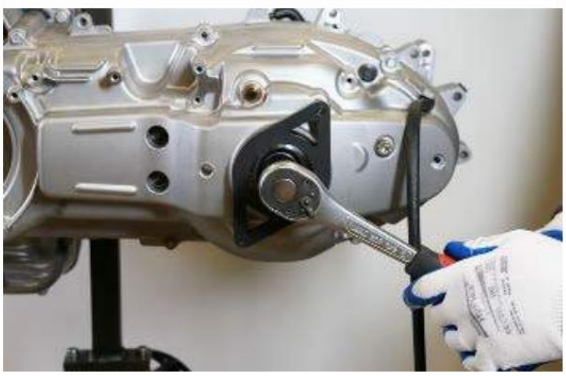
Place the special tool in the designated areas

Insert slots.

Special tool

021022Y Stop guided pulley

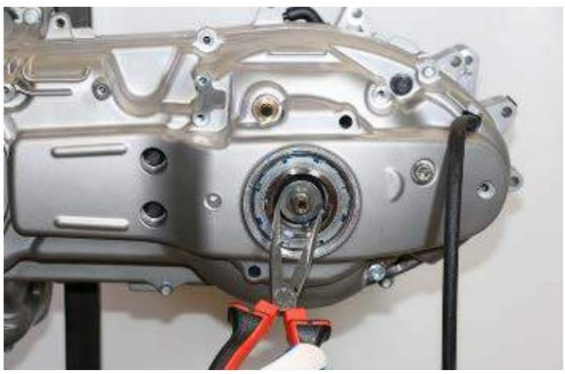
Nut shaft guided pulley.



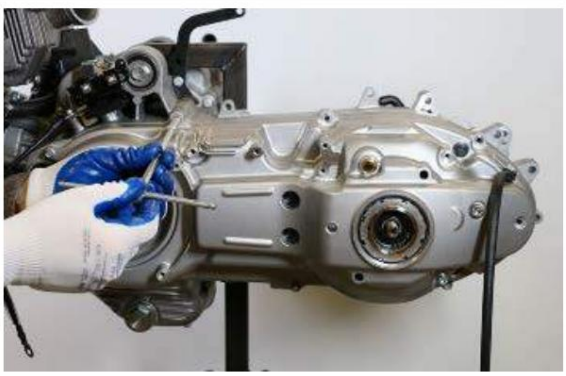
Remove the nut.

- Remove the special tool.

Remove the two washers.



Remove the drive cover screws (7 M6 screws).



Remove the screws on the right part of the cover

(2 screws M8).

Remove the screws on the middle part (2

M8 screws).

Remove the drive cover.

The engine mounting screws for the

Remove reverse gear (2 screws).

Remove the spacers.

- A suitable container for draining the

Set up gear oil.

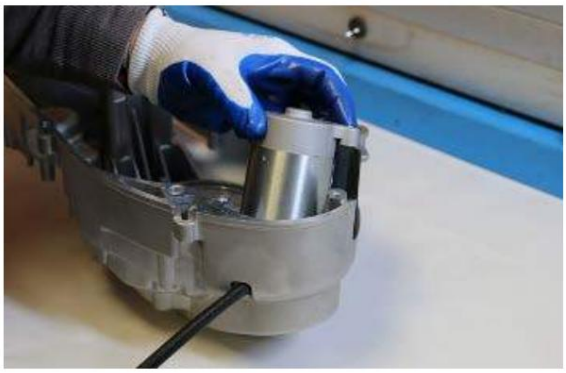
Remove the motor and the cable from the

Pull out the slot in the housing.

Turn the lid of the housing over to open the inside

Drain the oil contained in the reverse gear system

its.

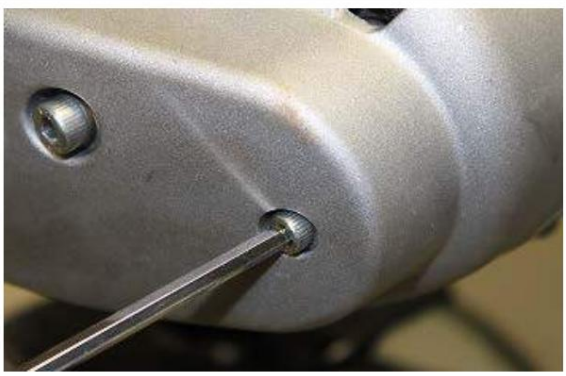


The screws inside the cover cover the tooth

Remove the reverse gear wheels (5 screws).

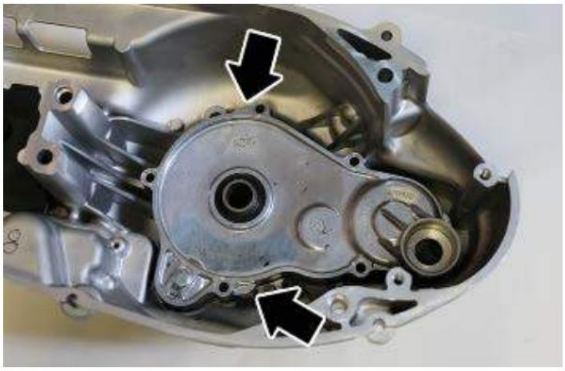
ben).

- Remove the outer screw.



To remove the lid, apply leverage to the projections shown in the photo.

Only if high resistance is encountered, heat the area to stop the process facilitate.



- The reverse gear cover lose weight.

- Remove the spring.

Remove the first gear.

Remove the second gear.

Remove the shaft.

Remove the drive bushing.

ANNOTATION

A SAFETY SYSTEM IS INSTALLED ON THE DRIVE SOCKET, WHICH WILL CAUSE IF A AT A CERTAIN SPEED, THE GUIDED BELT PULLEY MECHANICALLY PREVENTS THE RETURN GEAR INSERTION.

The fork group to control the ride and the

Remove the selector switch by lifting it evenly

distant.

Remove the control bushing.

The special tool on the outside of the An

Put on the drive cover.

Special tool

021024Y Key for blocking the tax bushing

Pay attention to the protrusion on the tool

the inner cavity is inserted, as in the photo

you can see.

The tool has the dual function of holding the control socket and acting as a holder for it

To serve as drive cover during removal.

The other part of the special tool on one Attach vise.

Special tool

021024Y Key for blocking the tax bushing

Clamp the drive cover in the vice, by fitting the two parts of the tool into each other be set.

Use a pin puller to remove the locking tooth of the block

Bend the idler disk downwards.

Place the special tool on the ring nut
zen and the teeth of the tool into the slots
insert the ring nut.

Special tool

021023Y Key to lock the ring nut

Loosen the threaded ring.

Take the drive cover out of the vice
Remove the men and the special tools.

The control socket on the inside of the lid
support, unscrew the ring nut and
Remove blocking disk.

Remove the control bushing.

INSTALLING THE REVERSE GEARS AND MOTOR

ANNOTATION

BEFORE INSTALLING THE CONTROL BUSHING, THE FLAT LUBRICATE THE SEALING RING IN THE GEAR COVER AND THE CLUTCH SURFACE OF THE BUSHING.

Suggested products

Gear oil 80W-90 lubricant for gears and drives.

SAE 80W-90 API GL-4

The control socket from the inside of the An

drive cover and the blocking disk from the ge

insert on the opposite page.

Tighten the ring nut by hand.

The special tool on the outside of the An
Put on the drive cover.

Special tool

021024Y Key for blocking the tax bushing

Pay attention to the protrusion on the tool
the inner cavity is inserted, as in the photo
you can see.

The other part of the special tool on one
Attach vise.

Special tool

021024Y Key for blocking the tax bushing

Clamp the drive cover in the vice,
by fitting the two parts of the tool into each other
be set.

Place the special tool on the ring nut

zen and the teeth of the tool into the slots

insert the ring nut.

Special tool

021023Y Key to lock the ring nut

The ring nut with the specified size

Tighten torque.

DANGER

WARNING

AFTER TIGHTENING, BEND ONE TOOTH OF THE LOCKING WASHER INTO ONE OF THE OUTER CAVITIES OF THE RING NUT.

Torque guide values (N*m)

Reverse gear control bushing ring nut 66 ÷ 74 Nm (49 ÷ 55 lb*ft)

Take the drive cover out of the vice

Remove the men and the special tools.

The fork group assembly for control

the drive and the selector switch together

build.

ANNOTATION

LUBRICATE THE FORK PINION AREA TO CONTROL TRAVEL.

Suggested products

Gear oil 80W-90 lubricant for gears
and drives.

SAE 80W-90 API GL-4

Mount the assembly on the control socket.

ANNOTATION

BEFORE INSTALLING, APPLY THE RECOMMENDED OIL BETWEEN THE TIMING BUSHING (CUTTER) AND THE GEAR SELECTOR.

Suggested products

Gear oil 80W-90 lubricant for gears and drives.

SAE 80W-90 API GL-4

Install the drive bushing.

Assemble the shaft.

The first gear with puf pointing downwards

Mount the remote side as shown in the photo.

Install the second gear.

Insert the spring.

DANGER

WARNING

ANNOTATION

MAKE SURE THAT THERE IS NO SECURING MEANS ON THE OUTSIDE OF THE GUIDE DRILLING OF THE CONTROLLER IS APPLIED.

Clean the mating surface, the specific safety

Apply solvent and remove the drive cover

Attach reverse gear.

Suggested products

THREE BOND TB1207B liquid gasket

Liquid gasket Three Bond TB1207B

Screw on the inner screws of the cover

(5 screws).

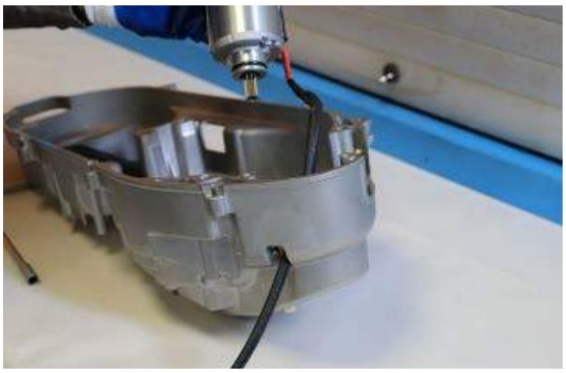
Torque guide values (N*m)

Screws of the cover of the gears of the

Reverse gear 11 ÷ 13 Nm (8 ÷ 10 lb*ft)

Position the motor with the cable through

the slot used for this purpose.



The passage of the motor cable and the posi

tion of the cap as shown in the figure

to target.

- Insert the spacers.

Tighten the three motor mounting screws

screw (2 screws).

Torque guide values (N*m)

Reverse motor mounting screws 11 ÷ 13 Nm (8 ÷ 10 lb*ft)

Insert the drive cover.

DANGER

WARNING

THE FOUR M8 SCREWS OF THE DRIVE COVER HAVE DIFFERENT LENGTHS: THE TWO LONG SCREWS ARE MOUNTED IN THE MIDDLE PART, THE TWO SHORT SCREWS IN THE RIGHT PART.

Screw on the screws in the middle part (2

long screws M8).

Torque guide values (N*m)

Fasteners M8 drive cover 23 ÷ 26 Nm (17 ÷ 19 lb*ft)

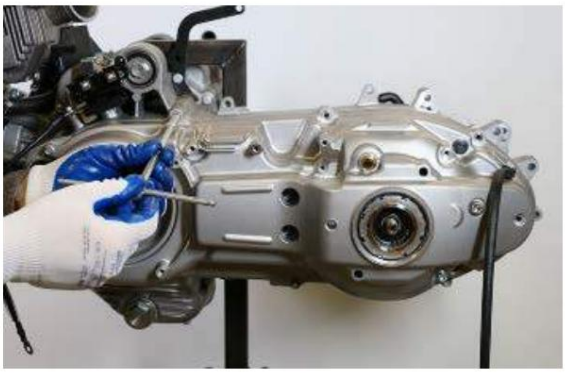
Screw on the screws in the right part (2 short M8 screws).

Torque guide values (N*m)

Fasteners M8 drive cover 23 ÷ 26 Nm (17 ÷ 19 lb*ft)

Tighten the drive cover screws

(7 M6 screws).



Torque guide values (N*m)

Fasteners M6 drive cover 11 ÷ 13 Nm (8 ÷ 10 lb*ft)

Install the two washers as per the photo

ren; first the one with the smaller diameter,

then the one with the larger diameter.

Place the special tool in the designated areas

Insert slots, rotate the shaft if necessary,

to be able to fully introduce it.

Special tool

021022Y Stop guided pulley

The nut of the shaft of the guided pulley

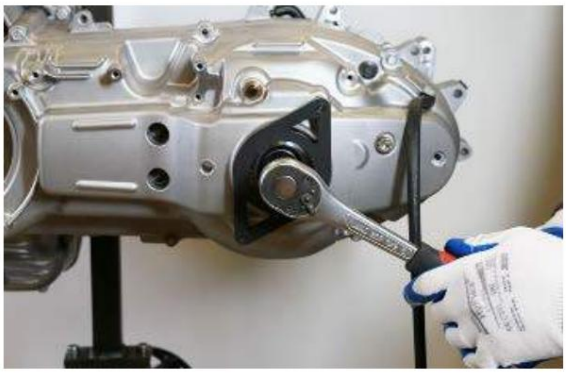
be assembled.

The mother with the prescribed dress code

ment tighten.

Torque guide values (N*m)

Nut guided pulley 92 ÷ 100 Nm (68 ÷ 74 lb*ft)



Remove the special tool.

The closure of the shaft of the guided belts

mount the disc.

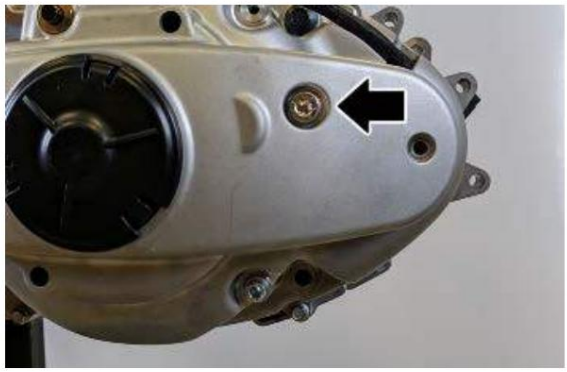
The positive cable of the motor for reverse gear connect, position the retaining plate and with fasten with the corresponding nuts.

DANGER

WARNING

CHECK AND CLEAN THE CONTACTS: POOR MAINTENANCE CONDITION COULD LEAD TO FUNCTIONAL MALFUNCTIONS AND A FIRE HAZARD.

Fill the system via the filling opening.



Suggested products

Gear oil 80W-90 lubricant for gears and drives.

SAE 80W-90 API GL-4

Technical information Oil for reverse gear system

90 cm³

Torque guidelines (N*m) Reverse system oil filler plug 15 ÷ 17 Nm (11 ÷ 13 lb*ft)

TABLE OF CONTENTS

BRAKE SYSTEM BRAKE

Rear brake caliper

expansion

- In preparation, remove the exhaust end part

ren.

- The two fastening screws of the rear

Remove brake caliper.

- Remove the brake caliper from its seat on the bracket

take.

ANNOTATION

IF THE BRAKE DISC IS REPLACED OR OVERHAUL THE CIRCUIT IN CONJECTION MUST BE CLOSED DRAIN AND LOOSEN THE FASTENING OF THE OIL CONNECTOR BEFORE REMOVALING THE BRAKE CALIPER FASTENERS TO THE HOLDER.

Installation

- The brake caliper in its seat on the bracket

to install.

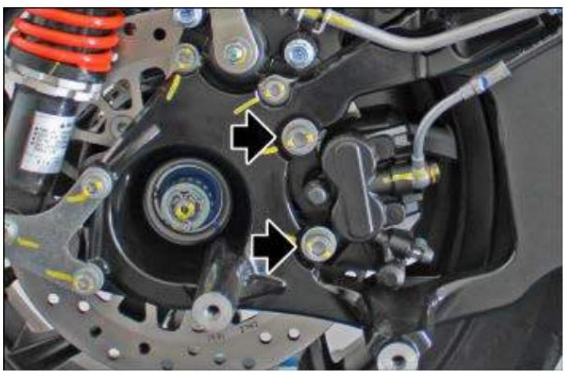
- Clean the threads of the fastening screws and apply

“LOCTITE 243” thread locking agent

Apply sealant and with the specified

Tighten torque.

- Install the exhaust end part.



Torque guide values (N*m)

Fastening screw brake caliper rear wheel brake 42.5 ± 2.5

Brake caliper front brake

expansion

- The specified work steps refer

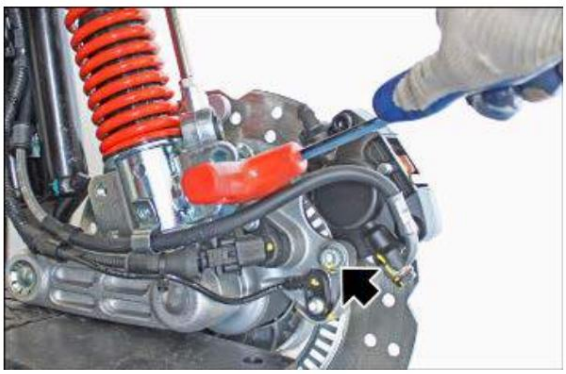
on one brake caliper, but apply to both.

- Remove the wheel.

- Unscrew the two fastening screws on the bracket and

remove the brake caliper

with.



Installation

- When installing the front brake calipers in reverse

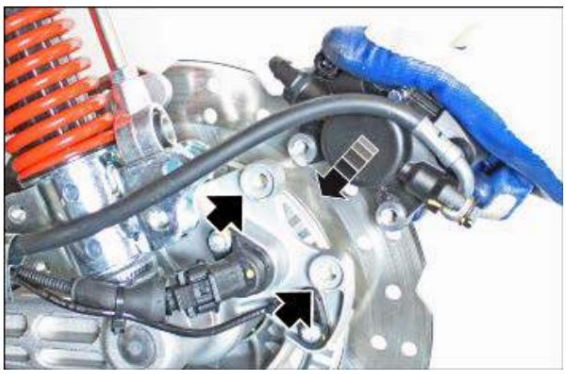
Proceed in the reverse order as for removal.

- Clean the threads of the fastening screws

gen and **"LOCTITE 243"** thread locking

Apply sealant and with the specified

Tighten torque.



Torque guide values (N*m)

Fastening screw brake caliper front wheel brake 22.5 ± 2.5

Front brake pads

expansion

- Remove the brake caliper.

- Remove the R-split from the brake caliper bolt

with.

- Pull out the bolt and make sure

that the retaining spring of the brake pads is on

is maintained.

- Remove the brake pads from the brake caliper

with.

Technical specifications

Minimum thickness of abrasive material

1,5 mm

Installation

- Insert the brake pads.

- Install the brake pad retaining spring

and insert the bolt into the brake caliper.

- Insert the R-split on the brake caliper bolt

was

- Reinstall the brake caliper.

Rear brake pads

Installation

- For mounting the brake pads in reverse

Proceed in the same order as for removal.

- Clean the threads of the brake pad pins and

"LOCTITE 243" thread locking sealant

Apply and with the specified torque

put on.

Torque guide values (N*m)

Brake pad pin 17.5 ± 2.5

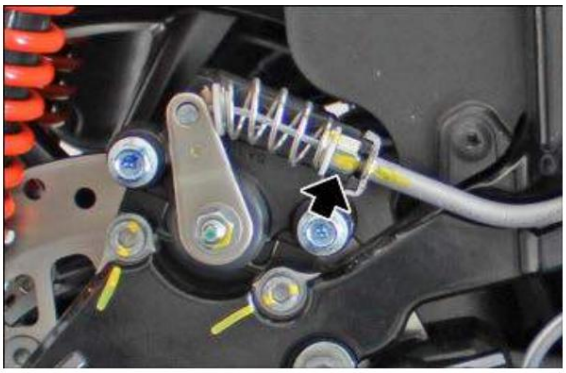
Parking brake

EXPANSION

- In preparation, remove the exhaust end part
ren.

- The two right-hand fastening screws
Remove fender.

- Loosen the brake control cable adjusting nut
sen, then the cable from the corresponding lever
remove.



- The two fastening screws of the mecha
Remove the niche brake caliper.

- Lift the rear fender slightly and
Remove the brake caliper from its seat on the retaining bracket
men.

- After removing the back of the shield, the cable
to switch on the protection device from the
Remove and separate your own seat.

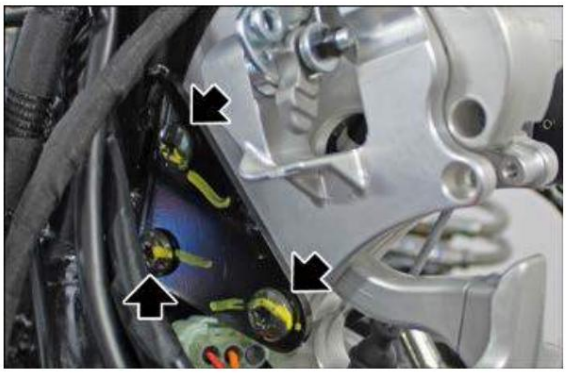
- When reinstalling, as shown in the photo, special
different to the correct insertion of the cylindrical
Make sure the metal end fits into its seat.

- The cable connector from the control button

Disconnect parking brake light.

- The three screws securing the lever to the

Unscrew the frame.



- The steering brake control cable

disconnect the lever.

ANNOTATION

WHEN THE CONTROL LEVER IS REMOVED, WITHOUT REMOVALING THE BRAKE CALIPER, DISCONNECT THE CABLE FROM THE BRAKE CALIPER
REMOVE THE LEVER.

INSTALLATION

- For assembling the locking components

brake in the reverse order as with

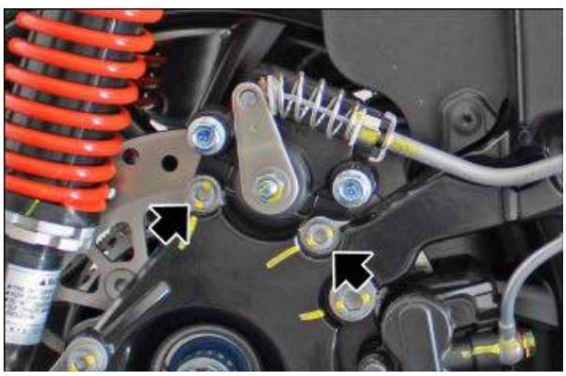
proceed with expansion.

- The threads of the fastening screws of the

Clean the brake caliper and **"LOCTITE 243"** thread

Apply anti-locking sealant and seal with the

Tighten the specified torque.



Torque guide values (N*m)

Screw brake caliper parking brake 25.5 ± 1.5

CHANGING THE BRAKE PADS

- Remove the mechanical brake caliper.

- Remove the two fixing pins and the

Remove the brake pads from the brake caliper

Make sure you have the appropriate retaining spring

to withdraw.

- Check that the thickness of the friction material

is greater than the minimum value, otherwise replace

the brake pads.

Technical specifications

Minimum thickness of abrasive material

1,5 mm

- To install the brake pads, proceed in the reverse order

of removal.

- Clean the threads of the brake pad pins and apply

"LOCTITE 243" thread locking sealant and to the

specified torque

put on.

Torque guide values (N*m)

Brake pad pin 17.5 ± 2.5

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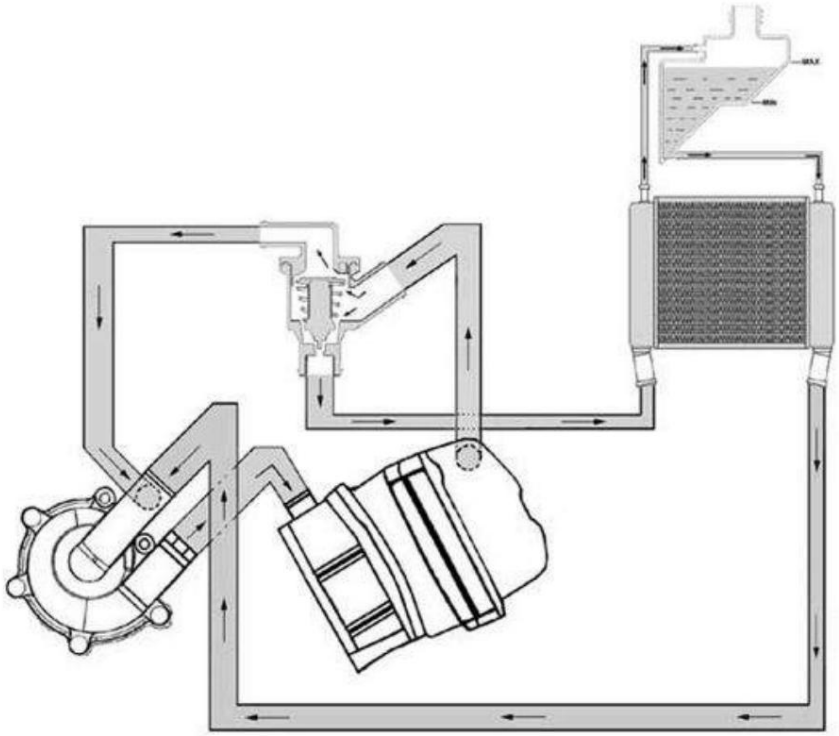
COOLING SYSTEM COOL

circuit diagram



The cooling system is a pressurized water circuit with a coolant pump and constant ventilation.
Cooling takes place via a centrifugal pump that is driven by the countershaft.
The coolant is routed from the pump to the thermal unit.
The bracket for the 2-way thermostat is attached to the outlet of the cylinder head, one of which
to the pump, the other to the cooler (with horizontal circulation).
The cooler output is connected directly to the pump.
The expansion tank is connected in parallel to the radiator.
The hot radiator housing is connected to the upper part of the expansion tank (air).
The cold radiator housing is connected to the lower part of the expansion tank (liquid).
When the engine is cold, the thermostat output to the radiator is closed, even if a small flow to the
ventilation is ensured through the opening on the closing plate.
In this case, the internal circulation in the thermal unit is activated to ensure a uniform
Ensure warming.
After reaching the operating temperature, the main circulation is at the cooler and at the expansion joint
barrel activated.
When the thermostat opens, there is a flow overlap (recirculation and main flow).
At higher temperatures, circulation via the thermostat is excluded in order to
To promote main circulation.
In this case there is also a considerable flow in the expansion tank, which ensures the constant
Self-venting ensures.

To vent the system when filling the circuit, there is a be. on the upper part of the cylinder head
A special connection is provided (see filling instructions).
A cooling fan is required to ensure adequate cooling even when there is no wind
provided, which is controlled via the injection system.

TECHNICAL SPECIFICATIONS

Technical information	Description/Value
Capacity of the cooling system	1,8 Liter
Recommended coolant	50% mixture of water and liquid for closed ones Circuits
sealing pressure	Closure calibrated to 0.9 bar

THERMOSTAT

Technical information	Description/Value
	with wax and branching
Opening start type	95 ± 2°C

COOLING FAN

Technical information	Description/Value
Type	With piston
Turning on the cooling fan	107°C
Turning off the cooling fan	103°C

WATER PUMP

Technical information	Description/Value
Type	centrifugal force
steering	Coaxial to the countershaft

COOLER

Technical information	Description/Value
Type	Made of aluminum, with horizontal circulation

EXPANSION VESSEL

Technical information	Description/Value
calibration	Self-venting, parallel to the radiator

TABLE OF CONTENTS

BODY IN THE WARS

This section è is dedicated to work on the vehicle body.

Bench

EXPANSION

- Raise the seat.

- Disconnect the driver position sensor connector

with.

- The petrol ring from the pneumatic cylinder seat

remove easily.

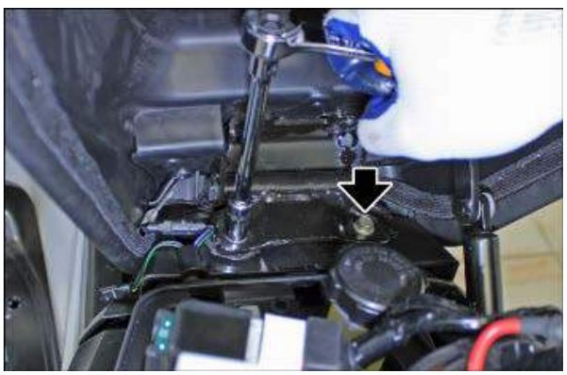
- Keep the plastic disc and the

Remove the pneumatic cylinder from the corresponding pin

distant.

- The two hinge mounting screws

remove the seat.



- Remove the seat from the vehicle.

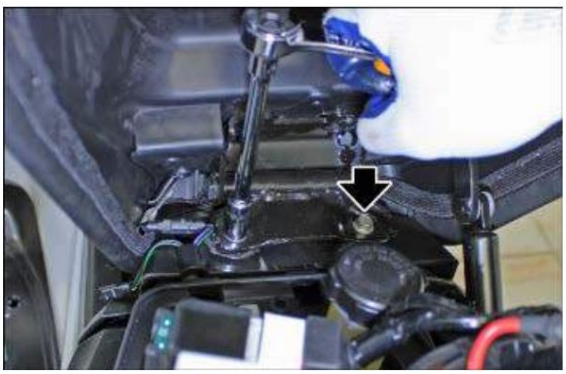
INSTALLATION

- Position the seat on the vehicle.

- Hold the seat and lift the rear part

ben, then the two fastening screws

Install hinge.



- The pneumatic cylinder on the corresponding pin

insert and install the plastic washer.

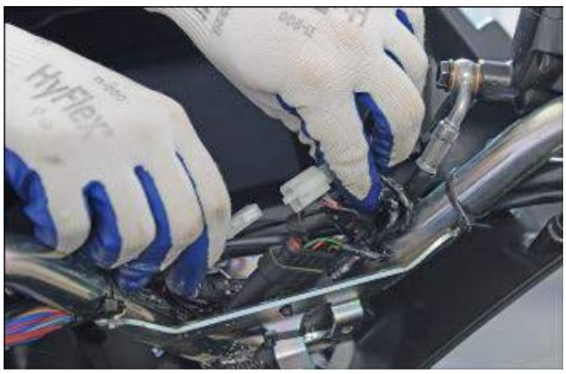
- The petrol ring on the pneumatic cylinder bolt install easily.

- The driver presence cable connector connect sors.

Rear handlebar fairing

EXPANSION

- Remove the upper handlebar cover.
- The cable connector shown in the illustration separate.



- Remove the rear fixing screw.

- Remove the two side fastening screws distant.

- Remove the handlebar cover from the vehicle nen, paying attention to the cabling
Do not strain the process.

INSTALLATION

- Install the handlebar cover on the vehicle.

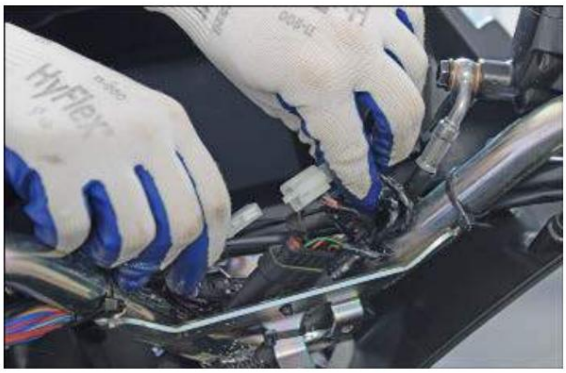
ANNOTATION

Route the wiring harness through from the front of the handlebars.

- Install the rear mounting screw.

- The two side fastening screws in stall.

- The cable connector shown in the illustration connect.

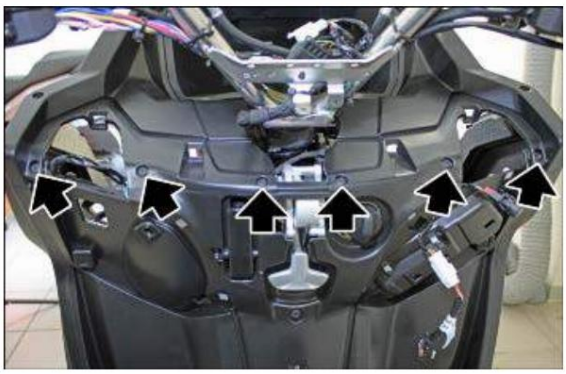


Instrument unit

EXPANSION

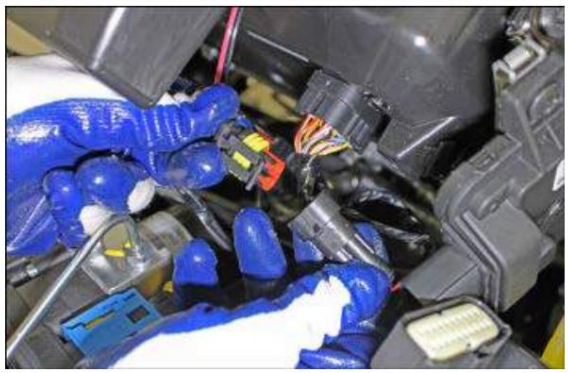
- Remove the front of the shield.
- Remove the handlebar covers.
- Remove the shield back panel.
- The six mounting screws of the Armatu

Remove the protective boards on the back of the shield.



- The cable connector of the PMP3 control electronics split off.

- The cable connector shown in the illustration separate.



- Disconnect the instrument cluster cable connector clamps.

- Cut the plastic clamp and the Verka release the cable.

- The dashboard complete with instruments unit and PMP3 control unit from the vehicle Remove.

- Adjust the dashboard to a suitable position

lay the side table.

- Unscrew the two fastening screws

and the PMP3 control unit from the fittings

remove board.

- From the inside of the dashboard

go and remove the two fastening screws

Unscrew the frame of the instrument unit.

- Press the frame fastening tabs,

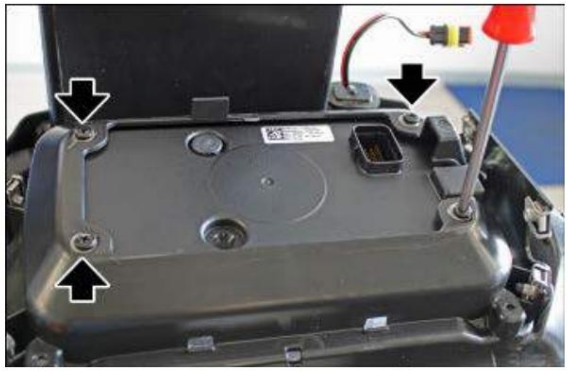
one at a time to remove them from the fittings

to solve the board.

- The frame of the instrument unit from the Ar

Remove tire board.

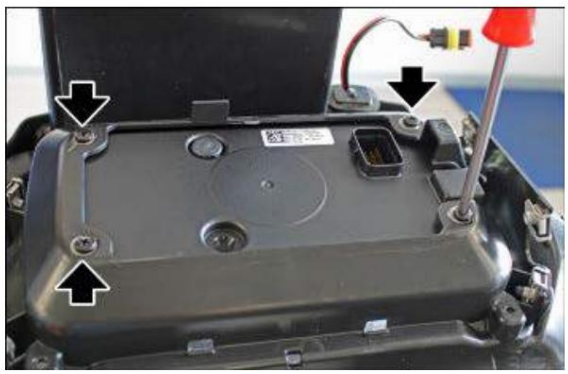
- The four mounting screws for the instruments
Unscrew the unit.



- The instrument cluster from the dashboard
remove.

INSTALLATION

- The instrument unit in the dashboard
Insert and from the inside with the four screws
attach.



- The frame of the instrument unit on the Arma
Install door panel. Ensure that the Be
fastening tabs correctly into their respective seats
are used.

- The two mounting screws of the yardarm

Tighten the instrument unit.

- The PMP3 control unit on the mounting brackets po

position, then the appropriate fasteners

Tighten the connection screws.

- The dashboard complete with instruments

unit and PMP3 control unit on the vehicle

situate.

- The wiring on the dashboard with a

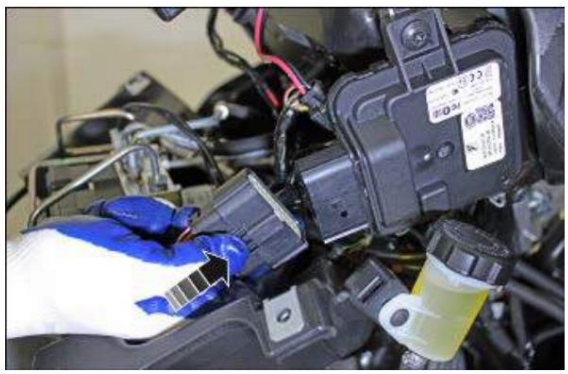
Attach the plastic clamp as shown in the illustration

shown.

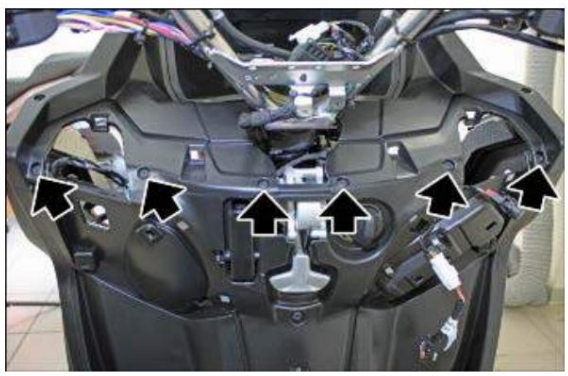
- Connect to instrument unit cable connector the.

- The cable connector shown in the illustration connect.

- The cable connector of the PMP3 control electronics connect.



- The six mounting screws of the Armatu Install renbretts on the back of the shield and tighten.
- Install the shield back cover.
- Install the handlebar covers.
- Install the shield front.



Front handlebar fairing

EXPANSION

- Remove both rear-view mirrors.
- Unscrew the two fixing screws shown in the illustration.

- Lift the handlebar cover up and off

Remove vehicle.

INSTALLATION

- Place the upper handlebar cover in its seat

and make sure they are properly connected to the lower steering

to connect the cover.

- The two fasteners shown in the picture

Insert and tighten the connection screws.

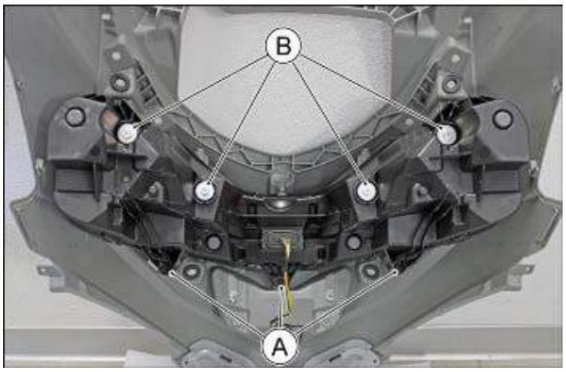
- Install the rearview mirrors.

Headlight unit

HEADLIGHT

EXPANSION

- Remove the front of the shield from the vehicle men.
- Unscrew the three fastening screws **«A»** ben.
- Unscrew the four fastening screws **"B".** ben and the headlight from the front of the shield remove page.



INSTALLATION

- Place the headlight in the appropriate seat Install on the front of the shield.
- Install the fixing screws **“B” .**
- Install the fixing screws **“A” .**

FLASHING

EXPANSION

- The lower indicator mounting screws screw off.

- The middle fixing screws of the Blink unscrew it first.

- The turn signal upper mounting screws
screw off.

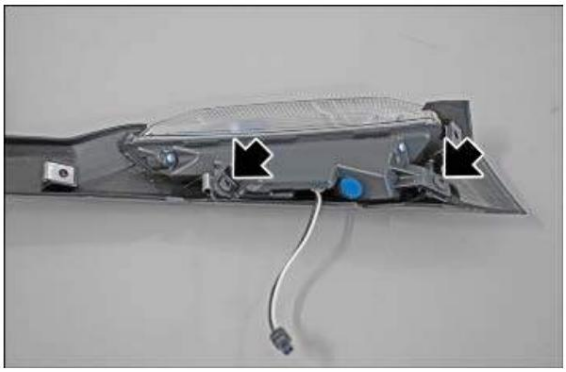
- Remove the indicator from the vehicle and...

Disconnect cable connector.

- On the opposite page the events

Repeat to remove turn signal.

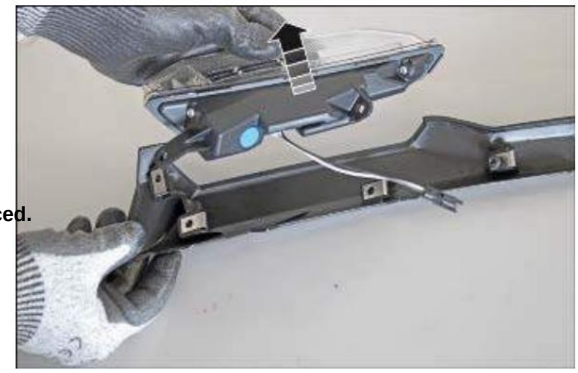
- The two indicator mounting screws
remove.



- Remove the indicator from the plastic holder

with.

The indicators are LED type, so they are maintenance-free.
In the event of a defect, the entire component must be replaced.



INSTALLATION

- To reassemble, carry out the disassembly in the reverse order, taking care

It is important that the indicators are correctly inserted into their seats.

Medium fairing

EXPANSION

- Remove the side panels.
- Remove the seat.
- Remove the back of the shield.
- Remove the two fixing screws shown in the figure on both sides.

- Temporarily remove the fuel cap and the underlying rubber carpet from the tank remove box.

- The driver presence sensor wiring pull out the middle cover.

- Lift the cover from the frame.
- Separate the cable jacket from its seat.

- Disconnect the cable from the door opening control and the center cover from the vehicle remove.

INSTALLATION

- To reassemble, reverse the disassembly procedures and then

Make sure that the door opening control cable and the presence sensor wiring are connected driver must be inserted correctly.

Front shield

EXPANSION

- The two front grill mounting screws remove.

- Remove the front grill from the front of the shield with.

- The front headlight cable connector

pull it off.

- The two side mounting screws

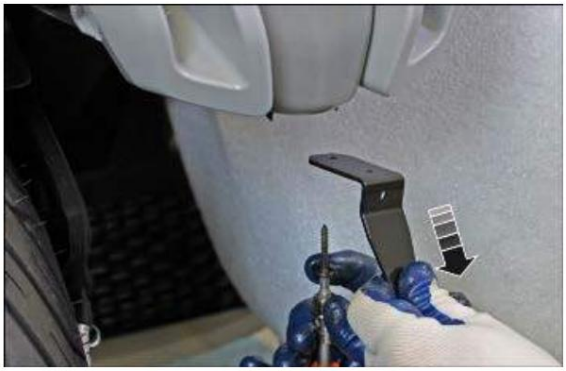
Remove the front spoiler.

- The middle fastening screw of the front

remove spoilers.

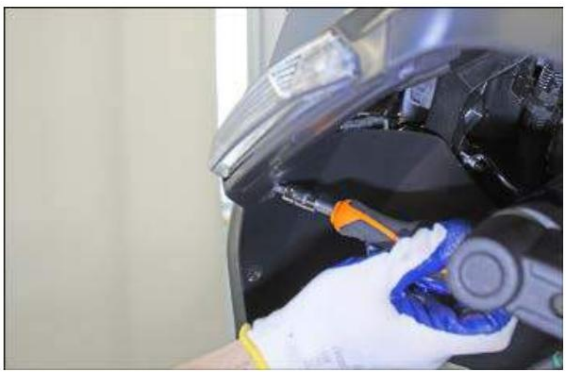
- Remove the front spoiler from the vehicle.

- Unscrew the two fastening screws
and remove the bracket from the vehicle.



- The lower indicator mounting screws
screw off.

- The middle fixing screws of the Blink
unscrew it first.



- The turn signal upper mounting screws
screw off.

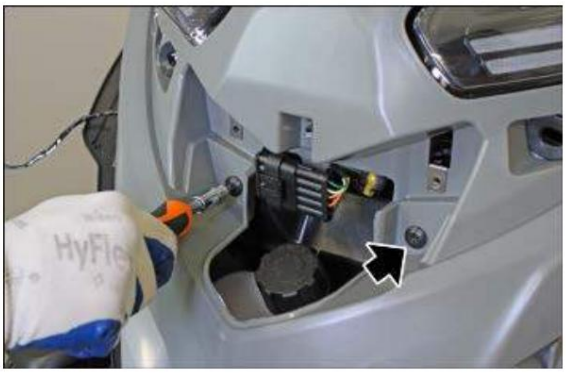
- Remove the indicator from the vehicle and...

Disconnect cable connector.

- On the opposite page the events

Repeat to remove turn signal.

- Remove the two middle fastening screws distant.



- The side, lower, fastening screw of remove both sides.

- The side, top, fixing screw of remove both sides.

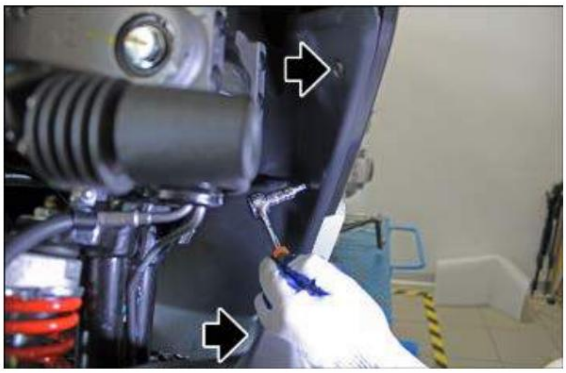
- The front section of the shield front from

Remove vehicle.

- Work from the inside of the wheel arch and

the three fastening screws of the side Ab

Remove section of shield.



- Raise the side section to the three

Fastening straps from the back of the shield

disconnect, then remove the component from the vehicle distant.

- The work for the side section on the ge

repeat on opposite side.

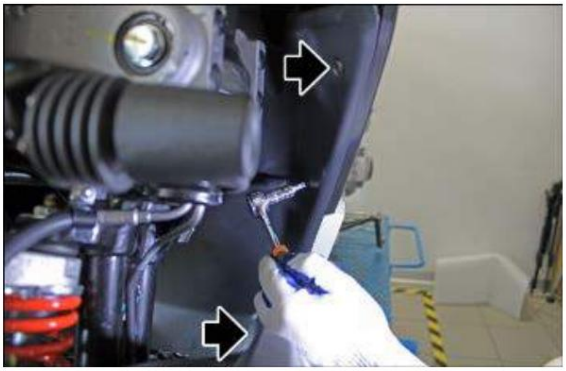
ASSEMBLY

- Install the side section of the front shield

hours on the vehicle, inserting the three tabs from above fastening to the back shield. Make sure of the correct to coupling between the two components.

- Working from the inside of the wheel arch, install
loosen the three fixing screws of the side section
of the shield.

- Repeat the operations for the section on the op side
place.

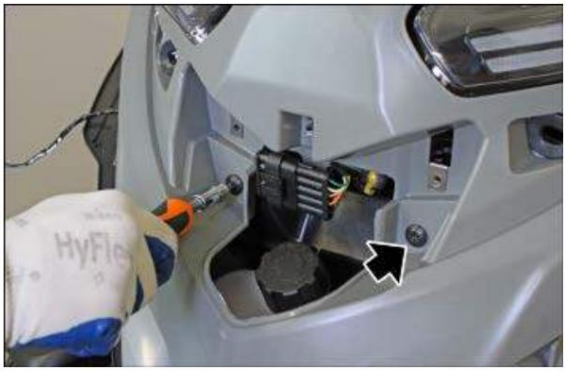


- Install the front section of the front shield
hours on the vehicle.

- Install the lateral, upper fixing screw,
on both sides.

- Install the side, bottom, fixing screw on
both sides.

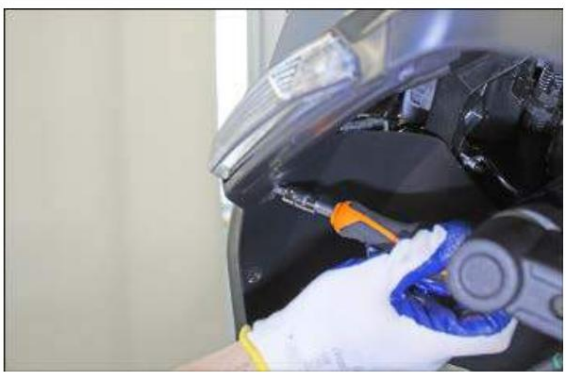
- Install the central fixing screws.



- Connect the connector and install the indicator direction on the vehicle.

- Install the upper fixing screw of the indicator direction indicator.

- Install the intermediate fixing screw of the index direction indicator.



- Install the two lower fixing screws.

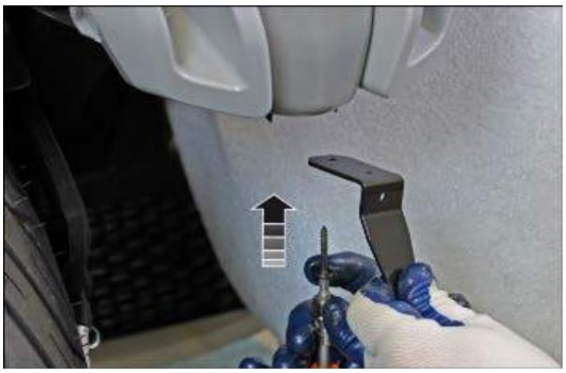
- Repeat the operations relating to the opposite side giving the installation of the direction indicator.

- Install the front spoiler fixing bracket

ale and tighten the relative fixing screws.

ANNOTATION

The long screw faces towards the front of the vehicle, the short one towards the rear.



- Install the front spoiler on the relative bracket fixing.

- Install the central spoiler fixing screw front.

- Install the spoiler side fixing screws front.

- Connect the front headlight connector.

- Install the front shield mask in the relevant office.

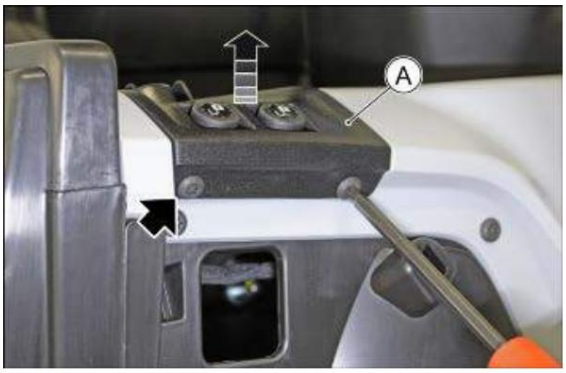
- Install the two fixing screws of the mask front.

Shield back

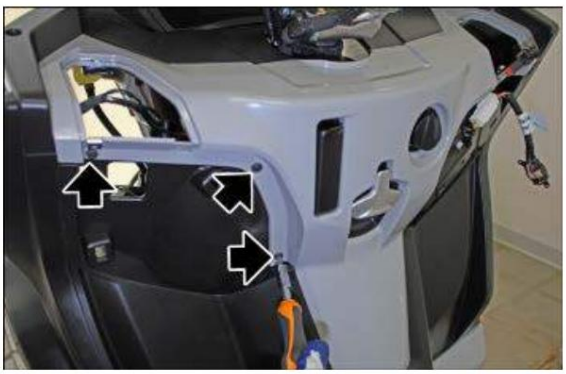
EXPANSION

- Remove the front of the shield.
- Remove the handlebar covers.
- Remove the two cushions from the back of the shield away and pull outwards.

- The two panel mounting screws Unscrew **“A” .**
- Lift panel **"A"** and disconnect the cable connectors and remove it from the vehicle.
- The work for the panel on the opposite side repeat on the following page.



- The three fasteners shown in the picture Unscrew the connection screws on both sides.



- The cover of the back of the shield from the vehicle remove stuff.

- The six mounting screws of the Armatu

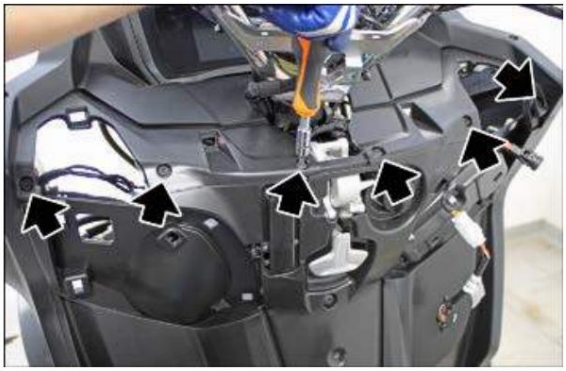
Remove the protective boards on the back of the shield.

- Then the dashboard of the instruments

Remove the device from the vehicle.

ANNOTATION

The procedure for removing the instrument cluster is described in the relevant section of the manual.



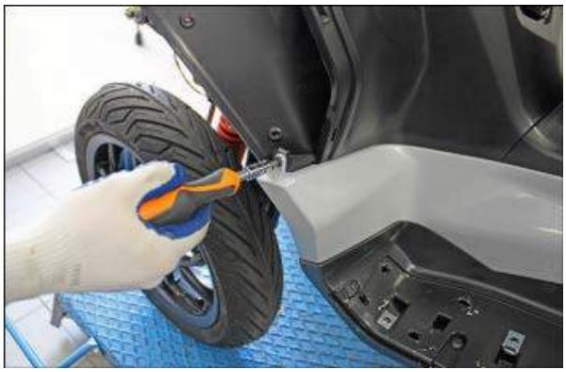
- Remove the running board inspection flap.

- The fastening shown in the picture

remove screw.

- The fastening shown in the picture

remove screw.



- Remove the side cover of the running board

with.

- Work for the cover on the counter

Repeat on opposite side.

- The two lower fastening screws

Remove back of shield.

- From the inside of the front wheel arch ar

work, on both sides those in the picture

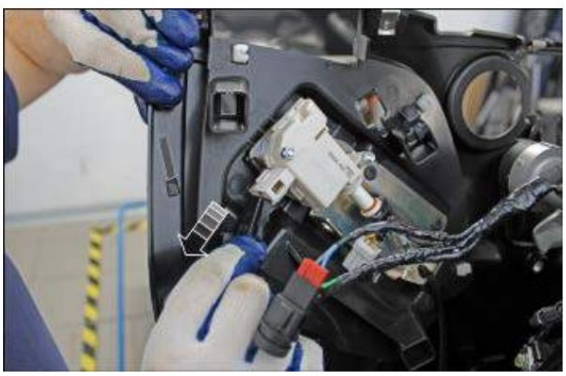
Remove specified screw.

- The middle fixing screw of the shield

Remove back.

- The cable connector of the seat opening adjusting device

disconnect voltage.



- Disconnect the transmission cable from the seat opening adjusting device.

- The wiring from the cable passage on the Separate the inside of the back of the shield.

- Remove the back of the shield from the vehicle with.

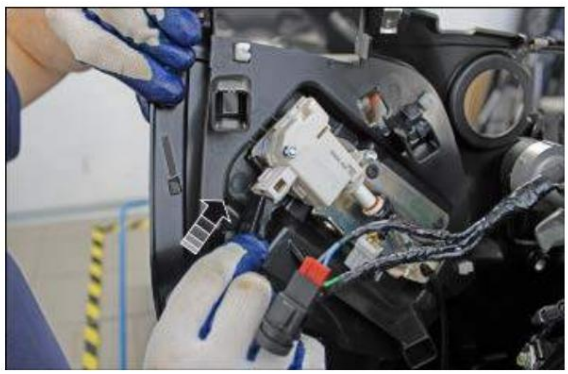
INSTALLATION

- Install the shield back on the vehicle.

- Attach the wiring to the corresponding cable gland on the inside of the back of the sign.

- The transmission cable to the adjusting device Connect seat opening.

- The cable connector of the seat opening adjusting device connection.



- The middle fixing screw of the shield Install back.

- From the inside of the front wheel arch ar

work, on both sides those in the picture

Install specified screw.

- The two lower fastening screws

Install shield back.

- On the vehicle, the side cover of the step

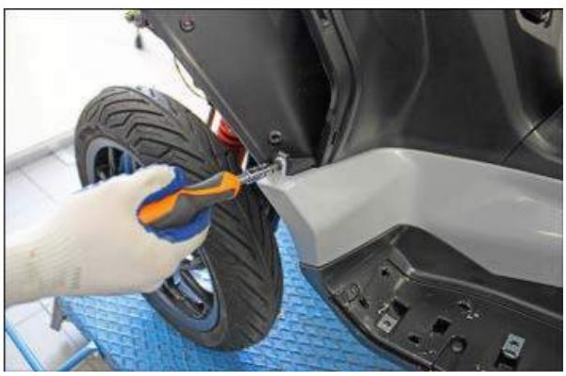
Install boards.

ANNOTATION

Make sure the mounting pins are correctly inserted and locked into their seats.

- The fastening shown in the picture

install screw.

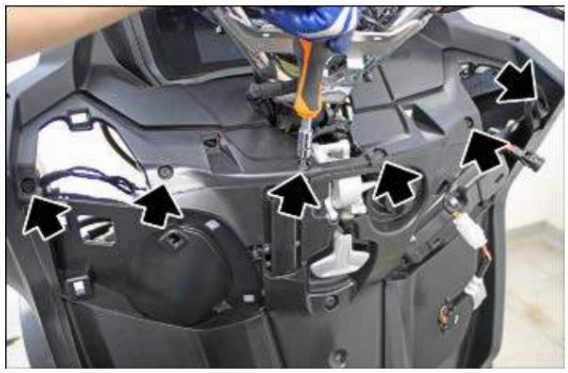


- The fastening shown in the picture
install screw.
- Install the inspection hatch on the running board.
- The installation work of the running board cover
repeat on the opposite side.

- The dashboard of the instrument cluster on
Install vehicle.
- The six mounting screws of the Armatu
Install renbretts on the back of the shield.

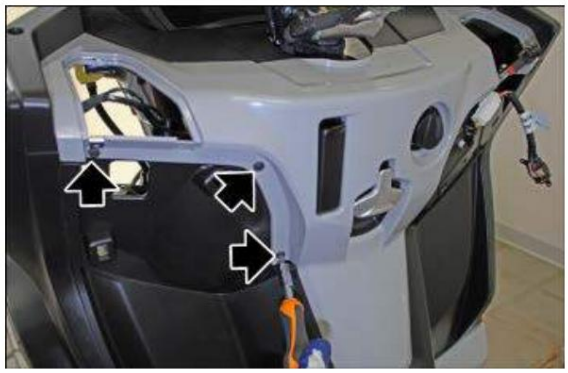
ANNOTATION

The procedure for installing the instrument cluster is described in the relevant section of the manual.

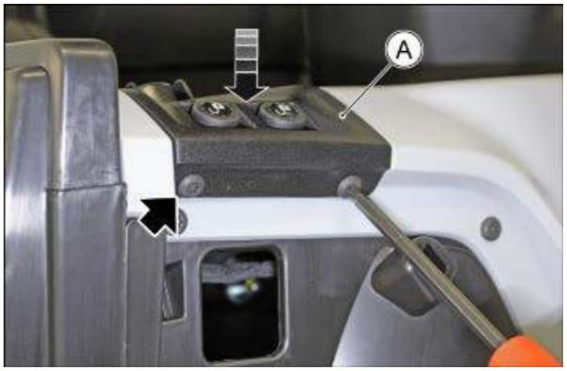


- The cover of the back of the shield on the vehicle
install stuff.

- The three fasteners shown in the picture
Install connection screws on both sides.



- Connect the cable connectors of the cabling and Install panel **"A"** on the back of the shield.
- Tighten the two fixing screws and repeat the work for the panel on the opposite side.

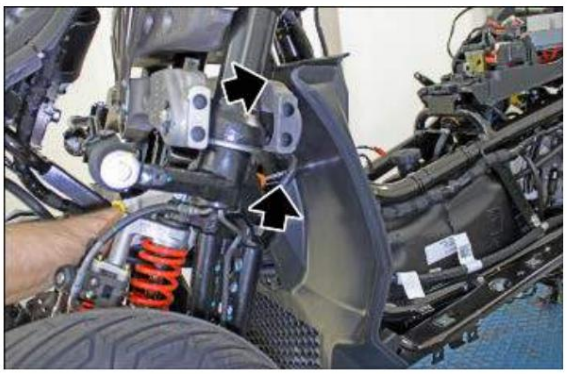


- Install both cushions on the back of the shield and make sure the mounting pins are correct are used properly.
- Install the handlebar covers.
- Install the shield front.

Front wheel housing

EXPANSION

- Remove the front of the shield.
- The two upper fastening screws of the Remove the wheel housing on both sides.



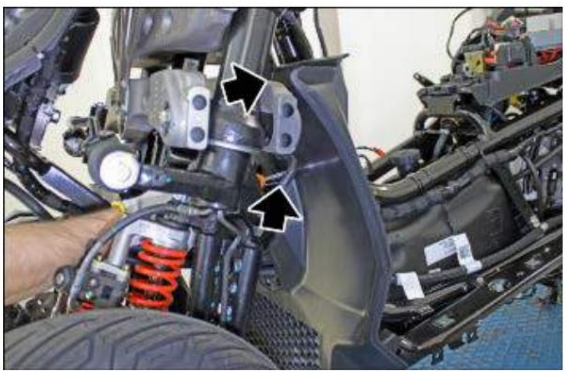
- The lower fastening screw on both sides remove ten.

- Remove the wheel arch from the vehicle.

INSTALLATION

- Install the wheel arch on the vehicle and make sure that it is correctly connected to the borders fits the plastics.

- The two upper fastening screws of the Install the wheel housing on both sides.



- The lower fastening screw on both sides install ten.

Rear light unit

- Remove both side parts.

- Disconnect the cable connector and unplug the

Remove the headlight unit from the retaining bracket.

- Remove the two fixing screws.

- Remove the taillight unit from the vehicle

in.

running boards

INSTALLATION

- Install the running board on the vehicle.

ANNOTATION

The work steps described refer to one side of the vehicle, but apply to both in order to assemble the running board from the vehicle.

- The four fasteners shown in the picture

install screws.

- Install the top mounting screw.

- Install the lower mounting screw.

- Install the rubber footboard on the running board,

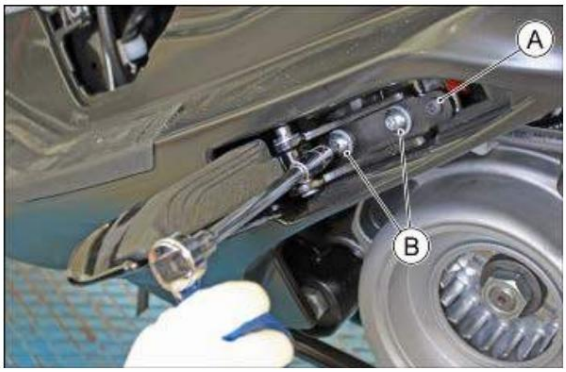
Make sure the “centering pins” are correctly in place

Use sitting.

- The fastening caps of the rubber cover to install.

- Proceed on the right side of the footboard: the pedal on Attach the brake lever and then the corresponding one Tighten the end fastening screws. After Complete the installation the rubber clamps like attach it to the brake lever.

- Install the passenger footboard on the vehicle and partly the screws "B", with washer tighten washers.
- Install the fixing screws **"A" ,** then tighten screws **“B” .**
- The central cover of the frame and all Reinstall previously removed components.

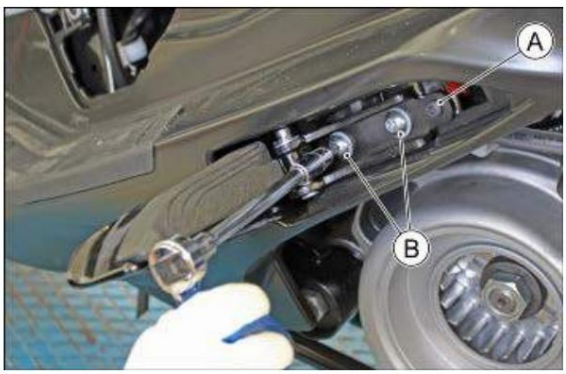


DISASSEMBLY

- Remove the central cover of the frame.
- Open the passenger footrest and unscrew the screw "A".
- Unscrew screws "B", collect the washers and remove remove the passenger footboard from the vehicle.

ANNOTATION

The operations described refer to one side of the vehicle, but are to be considered valid for both, for the purposes of removing the footrest from the vehicle.



- Operating on the right platform: lift the ceiling rubber screw, unscrew the two fixing screws of the brake pedal and remove the pedal from the vehicle colo.

- Remove the cover fixing caps eraser.

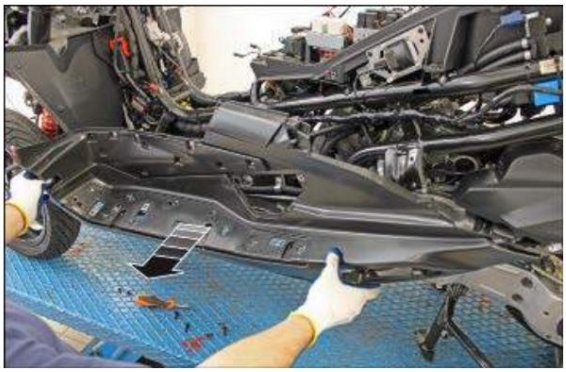
- Remove the rubber cover from the footboard.

- Remove the lower fixing screw.

- Remove the upper fixing screw.

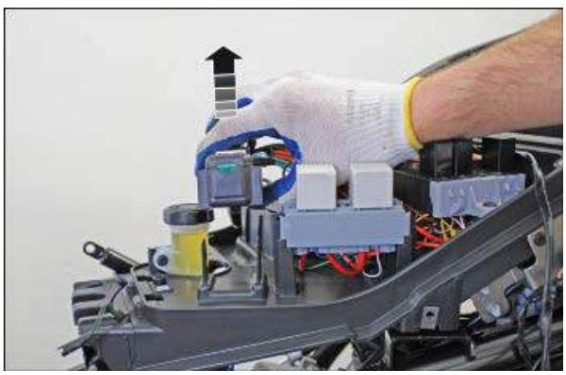
- Remove the four fixing screws indicated in figure.

- Remove the footrest from the vehicle.



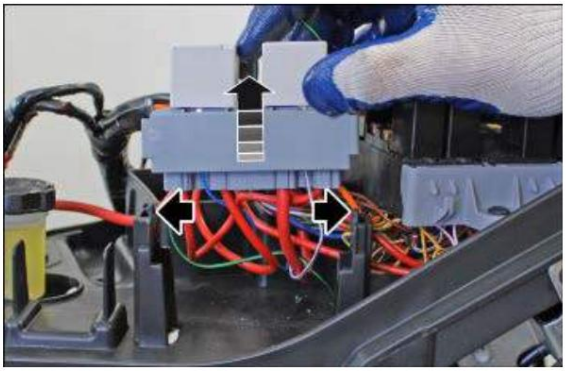
Helmet compartment

- Remove the seat.
- Disconnect and remove the battery.
- Remove both running boards.
- Pull the starter remote relay out of its seat.



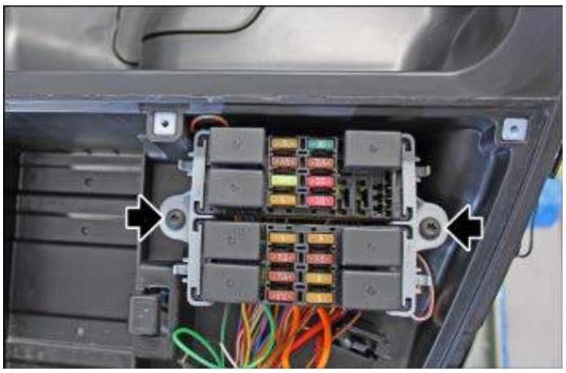
- Open the two safety tabs and the

Pull the relay base out of the seat.



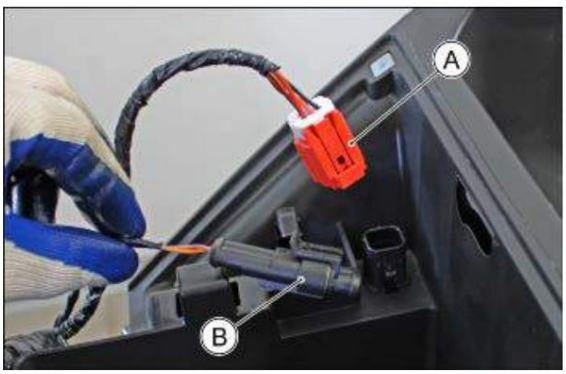
- The two securing screws

Unscrew the retainer and remove the fuse
Remove holder from its seat.

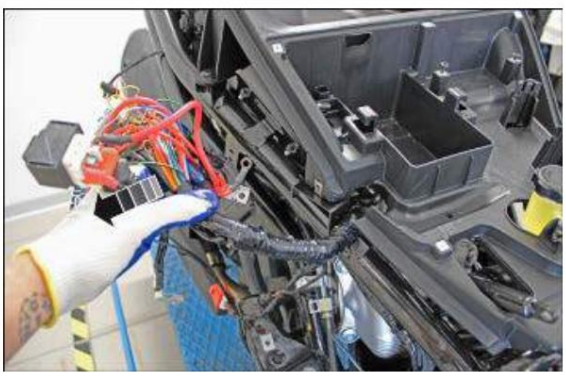


- The OBD2 socket **“A”** and **“B”** from the ent

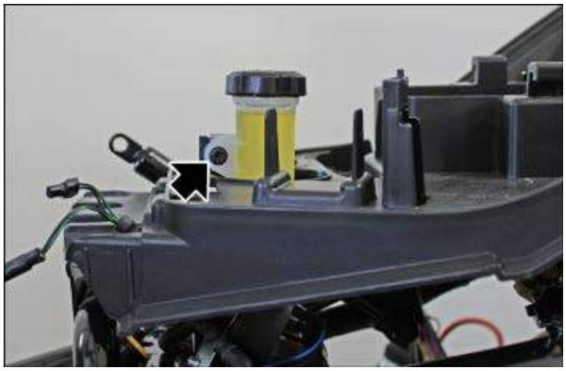
Remove speaking seats.



- The cabling and components like that
have just been removed, on the right vehicle
move page. Make sure there are no comms
components.



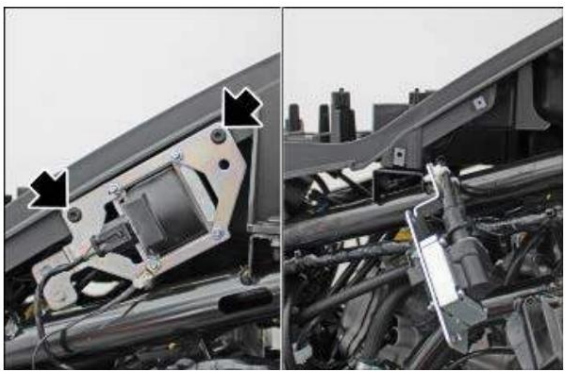
- The rear brake mounting screw
Unscrew the oil container.



- Place the rear wheel brake oil container in the corresponding

Attach the end opening in the helmet compartment.

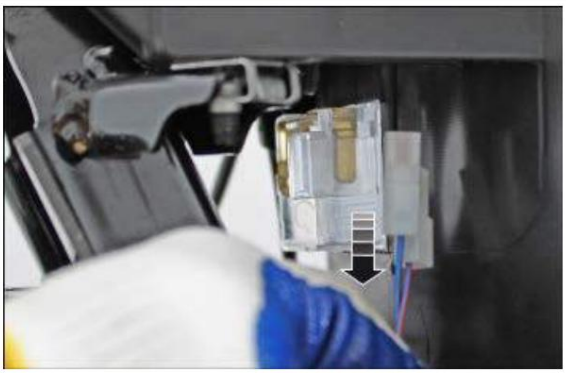
- Remove the two fastening screws
and attach the ignition coil to the frame tube.



- Proceed to the rear of the vehicle and

Remove the right additional light connector.

- The two cables from the seat lock switch remove.



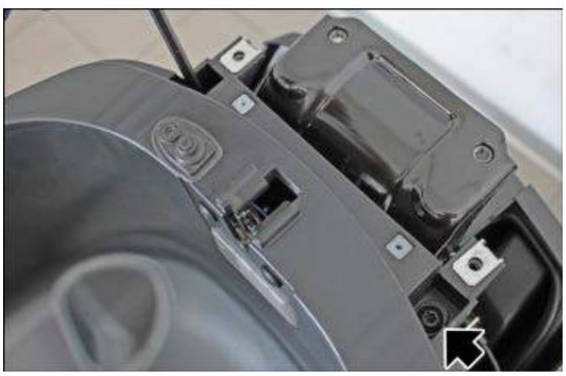
- The two side fastening screws

Unscrew the helmet compartment.

-The process on the opposite side repeat.

- Remove the front fixing screw.

- Remove the two rear mounting screws distant.



- Lift the rear part of the helmet compartment to act on the seat lock cables can.
- The cable lock with a screwdriver remove.

- Push the cable jacket outwards to seal it from the holder and the cable from the corresponding cylindrical end on the seat Release opening control.
- Repeat the steps for the second cable.

- Remove the helmet compartment from the vehicle.

A

Dashboard: *82*

B

Battery:

AND

Recommended products: *49*

F

Chassis and engine number: *23*
Vehicle: *18, 120*

G

Gear oil: *51*

K

The control: *11*

L

Lamps: *84*
Air filter: *52*

M

Unit of measurement:

Engine oil: *54*

S

Headlight unit: *273*

Fuses: *85*
Bench: *262*

T

Technical information: *216*

IN

Maintenance: *46*

WITH

Spark plug: *50*

HE

Oil filter: