KTM MOTORCYCLES

REPARATURANLEITUNG
REPAIR MANUAL
MANUALE DI RIPARAZIONE
MANUEL DE RÉPARATION

MOTOR
ENGINE
MOTORE
MOTEUR

400 / 620 LC4 / LC4 e

'97

5. 97 ART. NR. 3.205.18

INTRODUCTION

THIS REPAIR MANUAL OFFERS EXTENSIV REPAIR-INSTRUCTIONS AND IS AN UP-TO-DATE VERSION THAT DESCRIBES THE LATEST MODELS OF THE SERIES. HOWEVER, THE RIGHT TO MODIFICATIONS IN THE INTEREST OF TECHNICAL IMPROVEMENT IS RESERVED WITHOUT UPDATING THE CURRENT ISSUE OF THIS MANUAL.

A DESCIRIPTION OF GENERAL WORKING MODES COMMON IN WORK SHOPS HAS NOT BEEN INCLUDED. SAFETY RULES COMMON IN THE WORK SHOP HAVE ALSO NOT BEEN LISTED. WE TAKE IT FOR GRANTED THAT THE REPAIRS ARE MADE BY QUALIFIED PROFESIONALLY TRAINED MECHANICS.

READ THROUGH THE REPAIR MANUAL BEFORE BEGINNING WITH THE REPAIR WORK.

⚠ WARNING ⚠

STRICT COMPLIANCE WITH THESE INSTRUCTIONS IS ESSENTIAL TO AVOID DANGER TO LIFE AND LIMB.

! CAUTION !

NON-COMPLIANCE WITH THESE INSTRUCTIONS CAN LEAD TO DAMAGE OF MOTORCYCLE COMPONENTS OR RENDER MOTORCYCLES UNFIT FOR TRAFFIC !

„NOTE" POINTS OUT USEFUL TIPS.

USE ONLY **ORIGINAL KTM SPARE PARTS** WHEN REPLACING PARTS.

THE KTM HIGH PERFORMANCE ENGINE IS ONLY ABLE TO MEET USER EXPECTATIONS IF THE MAINTENANCE WORK IS PERFORMED REGULARLY AND PROFESSIONALLY.

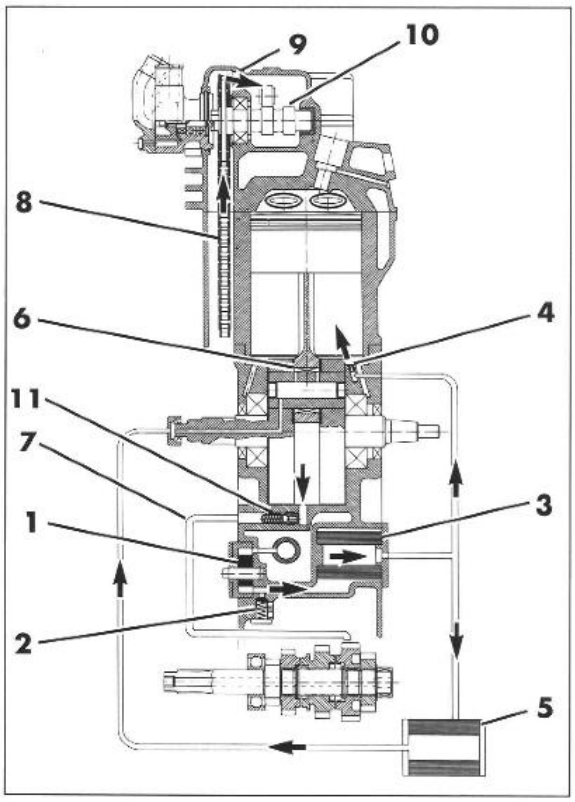
FOR TECHNICAL DATA SEE LAST SECTION OF THIS MANUAL. UP-TO-DATE INFORMATION IS PUBLISHED IN OUR UPDATED SPARE PARTS CATALOGUES.

TÜV CERT
FOR QUALITY SYSTEM
ISO 9001
REG.NO. 12 100 6061

KTM AUSTRIA'S CERTIFICATE OF ACHIEVEMENT FOR ITS QUALITY SYSTEM ISO 9001 IS THE BEGINNING OF AN ON- GOING TOTAL RE-ENGINEERED QUALITY PLAN FOR A BRIGHTER TOMORROW.

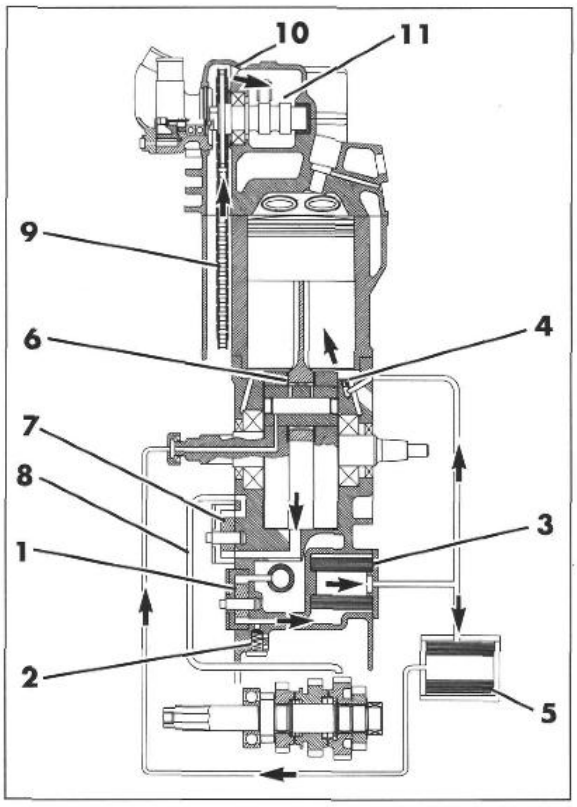
KTM SPORTMOTORCYCLE AG
5230 MATTIGHOFEN, AUSTRIA

1.0 General



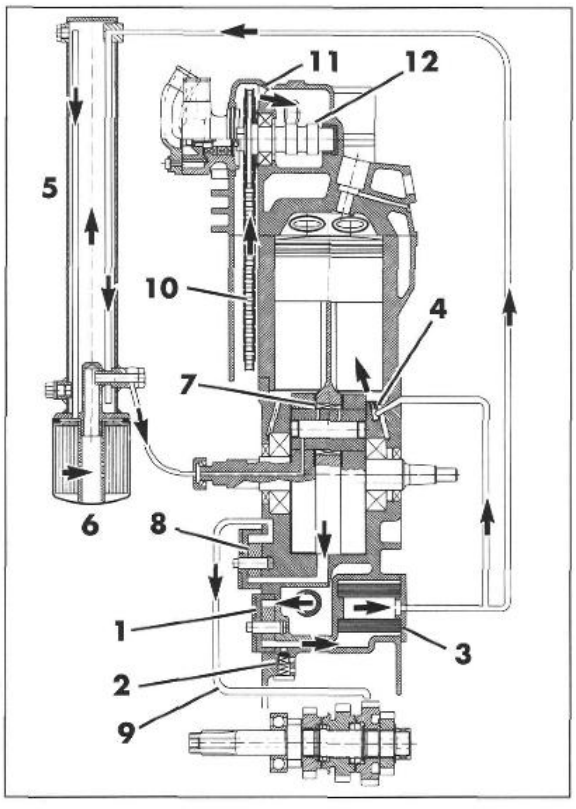
1.1 Oil circuit (SX)

The oil pump ❶ pumps the engine oil past the by-pass valve ❷ through the oil filter ❸. After the oil filter, an oil lead branches off to a jet ❹ which sprays engine oil onto the piston pin bearing and piston head. The second oil lead takes the main flow of oil to the microfilter ❺, which filters out even the finest impurities. The cleaned engine oil is pumped through the oil lead and the clutch cover into the crankshaft to the connecting rod bearing ❻ and drips into the crankcase. By means of the changing pressure relationship the oil is pushed through the oil duct ❼ to the gears and reaches the oil sump through the gear wheels. The timing chain ❽ is also immersed and passes the engine oil to the top, to the cylinder head. Through the bore hole ❾ the engine oil reaches the camshaft ❿ and the valves. The ball valve ⓫ prevents engine oil from running from the oil sump back into the crankcase.



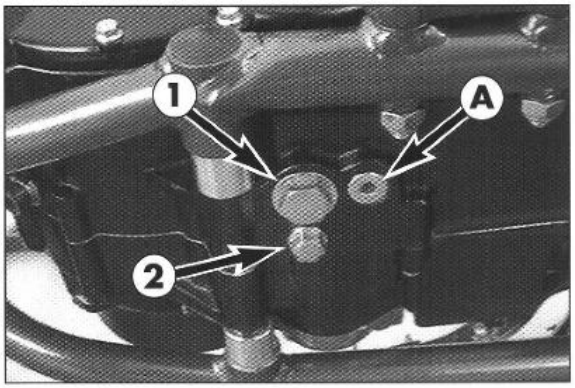
1.1.2 Oil circuit (SC)

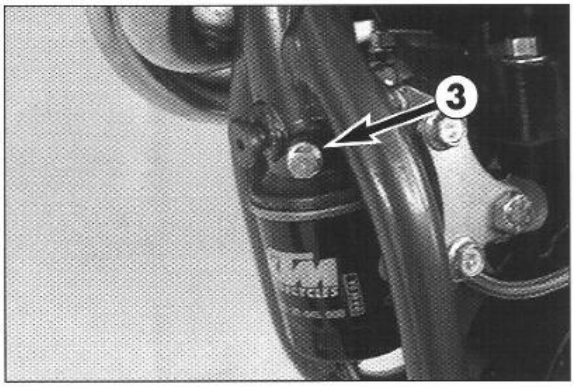
The oil pump ❶ pumps the engine oil past the by-pass valve ❷ through the oil filter ❸. After the oil filter, an oil lead branches off to a jet ❹ which sprays engine oil onto the piston pin bearing and piston head. The second oil lead takes the main flow of oil to the microfilter ❺, which filters out even the finest impurities. The cleaned engine oil is pumped through the oil lead and the clutch cover into the crankshaft to the connecting rod bearing ❻ and drips into the crankcase. An additional oil pump ❼ sucks the engine oil out of the crankcase and pumps it through the oil line ❽ to the gear wheels of the 4th and 5th gear. Via the gear wheels, the engine oil reaches the oil sump. The timing chain ❾ runs through the oil sump and transports the engine oil upwards to the cylinder head. Through the bore ❿ the oil reaches the camshaft ⓫ and the valves.

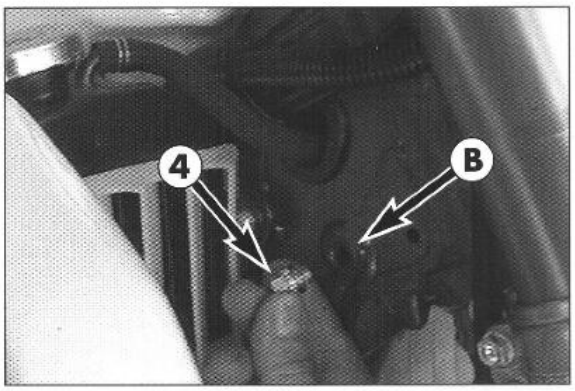


1.1.2 Oil circuit (EGS, Duke)

The oil pump ❶ pumps the engine oil past the by-pass valve ❷ through the oil filter ❸. After the oil filter, an oil line branches off to a jet ❹ which sprays engine oil onto the piston pin bearing and piston head. The second oil line takes the main flow of oil into the front pipe of the frame ❺, where the engine oil is cooled down. Afterwards the engine oil runs through the fine screen filter ❻, which filters out even the finest impurities. The cleaned engine oil is pumped through the oil line and the clutch cover into the crankshaft to the conrod bearing ❼ and drips into the crankcase. An additional oil pump ❽ sucks the engine oil out of the crankcase and pumps it through the oil line ❾ to the gear wheels of the 4th and 5th gear. Via the gear wheels, the engine oil reaches the oil sump. The timing chain ❿ runs through the oil sump and transports the engine oil upwards to the cylinder head. Through the bore hole ⓫ the oil reaches the camshaft ⓬ and the valves.







1.2 Changing the engine oil

NOTE: FOR IMPROVED COOLING OF THE ENGINE OIL THE FRONT PIPE OF THE FRAME IS INTEGRATED INTO THE OIL CIRCUIT. WHEN CHANGING THE OIL, THE ENGINE OIL MUST BE DRAINED FROM THE FRONT PIPE.

The engine oil change is to be carried out when the engine is still warm.

⚠ WARNING ⚠

AN ENGINE HAVING BEEN RUN WARM, AND THE ENGINE OIL IN IT ARE VERY HOT - DO NOT BURN YOURSELF.

- Place the motorcycle on a horizontal surface. Remove the two plugs ❶ and ❷, and drain oil into a container.
- Models with integrated font pipe: Remove cover, unscrew plug ❸ at the lower end of the front pipe and drain oil.

! CAUTION !

PLUG Ⓐ MUST NOT BE REMOVED, THIS IS PART OF THE BY-PASS VALVE.

- Clean all 3 plugs thoroughly with a fireproof solvent and compressed air, in order to remove the metal abrasion.
- After all the oil has drained through, clean sealing areas and install plugs with gaskets. Tighten plug ❶ with 30 Nm (23 ft.lb) and plugs ❷ and ❸ with 20 Nm (15 lb.ft).
- Remove plug on the clutch cover, fill in engine oil and attach plug again.

OIL QUANTITY SX, SC:	APPROX. 1.6 L
OIL QUANTITY EGS, DUKE:	APPROX. 2.1 L

! CAUTION !

IF THE ENGINE OIL HAS BEEN DRAINED FROM THE FRONT PIPE OF THE FRAME, YOU MUST BLEED THE OIL SYSTEM!

- To allow the air to escape from the front pipe of the frame, remove plug ❹ next to the steering head. Start engine and let it run in idle (1-2 minutes) until oil escapes at the bore Ⓑ. As soon as oil starts to escape, turn off the engine, and mount plug together with the gasket.

NOTE: TO ACCELERATE THE BLEEDING PROCESS, IT IS RECOMMENDED TO FILL THE FRONT PIPE OF THE FRAME WITH OIL (APPROX. 0.7 L) THROUGH OPENING Ⓑ.

! CAUTION !

DO NOT REV UP THE ENGINE DURING THE BLEEDING PROCEDURE BECAUSE NOT ALL THE LUBRICATING POINTS WILL ALREADY HAVE BEEN SUPPLIED WITH SUFFICIENT AMOUNTS OF OIL.

- Warm up engine, check engine oil level and refill up to the marking MAX.
- Finally check the oil system for leaks.

API: SF, SG, SH

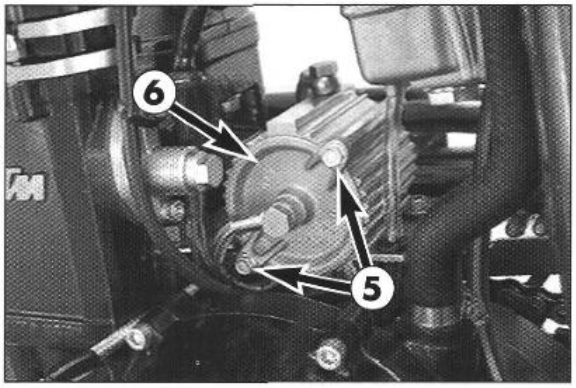
TEMPERATURE

−	0°C 32°F	+
10W 40		15W 40
10W 50		15W 50
10W 60		15W 60

! CAUTION !

- ONLY USE HIGH-QUALITY OILS MEETING OR SURPASSING THE QUALITY REQUIREMENTS OF API CLASSES SF, SG, OR SH (FOR SPECIFICATIONS SEE CONTAINERS).
- INSUFFICIENT OIL OR POOR QUALITY OIL RESULTS IN PREMATURE WEAR OF THE ENGINE.
- YOU MAY USE EITHER MINERAL OILS OR SYNTHETIC OILS FULFILLING THE ABOVE CRITERIA.

NOTE: DISPOSE OF USED OIL PROPERLY! UNDER NO CIRCUMSTANCES MAY USED OIL BE DISPOSED OF IN THE SEWAGE SYSTEM OR IN THE OPEN COUNTRYSIDE. 1 LITER OIL CONTAMINATES 1.000.000 LITER WATER.

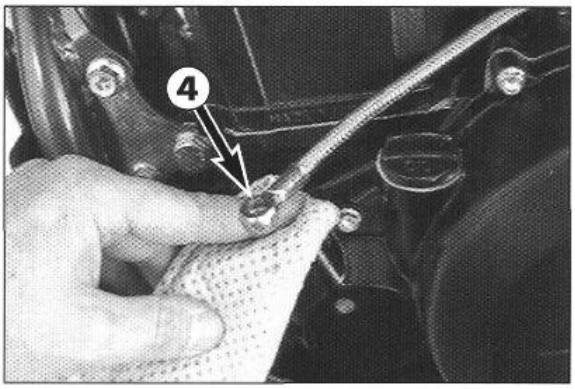


1.3 Changing the microfilter (SX, SC)

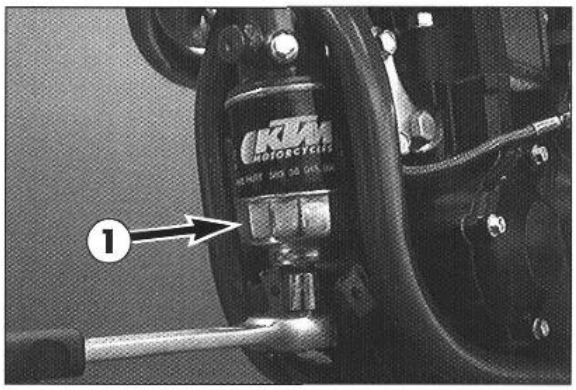
Replace the microfilter while changing the engine oil.

- To do so, remove HH screws ❺ and take off the microfilter cover ❻.
- Remove the microfilter, clean its parts and check the O-ring on the microfilter cover for signs of damage.
- Place a new microfilter in the filter housing, apply a thin layer of grease to the O-ring and mount the microfilter cover.

NOTE: TO ACCELERATE THE BLEEDING PROCESS, IT IS RECOMMENDED TO FILL THE MICRO-FILTER HOUSING WITH OIL BEFORE MOUNTING THE MICROFILTER COVER (MOTORCYCLE MUST LIE ON ITS RIGHT SIDE).



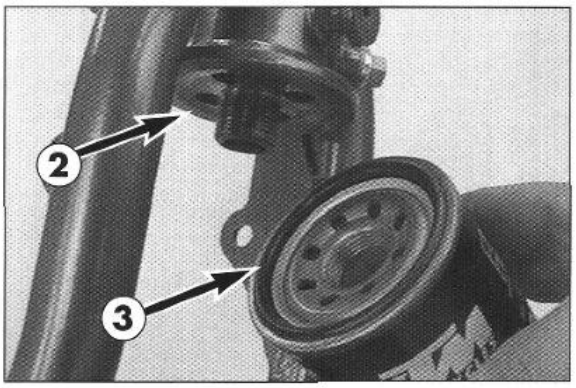
- It is necessary to bleed the microfilter so that all lubricating points can be quickly supplied with engine oil.
- To do this, fill with oil and remove the jet screw from the oil line on the clutch cover.
- Start the engine and close off the bore on the clutch cover with a rag.
- Allow the engine to run at idle until oil runs out of the oil line ❹.
- Turn the engine off. Install seal rings and the jet screw.
- Torque the jet screw to 10 Nm and check for leaks.



1.4 Changing the fine screen filter

Replace the fine screen filter when changing the engine oil.

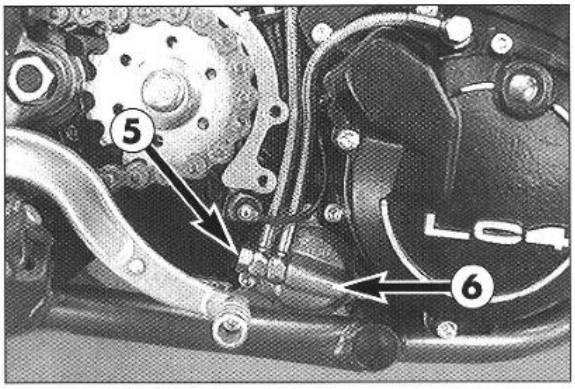
- To do so, loosen the three screws and remove the cover.
- Loosen the fine screen filter with an oil filter wrench ❶ (583.29.039.000); you will be able to unscrew it the rest of the way with your bare hand. Let engine oil flow out of the front pipe of the frame.



- Clean sealing surfaces on the front pipe ❷, fill new fine screen filter with engine oil, and oil rubber gasket ❸. Replace fine screen filter and screw it back in place, your bare hand will do.
- Start motor, bleed oil system (see Changing the engine oil) and make sure that the fine screen filter does not leak.

! CAUTION !

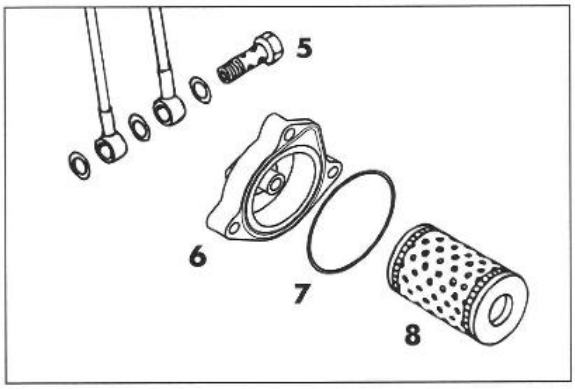
- USE ONLY ORIGINAL KTM FINE SCREEN FILTERS. USING ANOTHER FILTER BRAND CAN RESULT IN DAMAGE TO THE ENGINE.
- IF THE ENGINE OIL HAS BEEN DRAINED FROM THE FRONT PIPE OF THE FRAME, YOU MUST BLEED THE OIL SYSTEM!



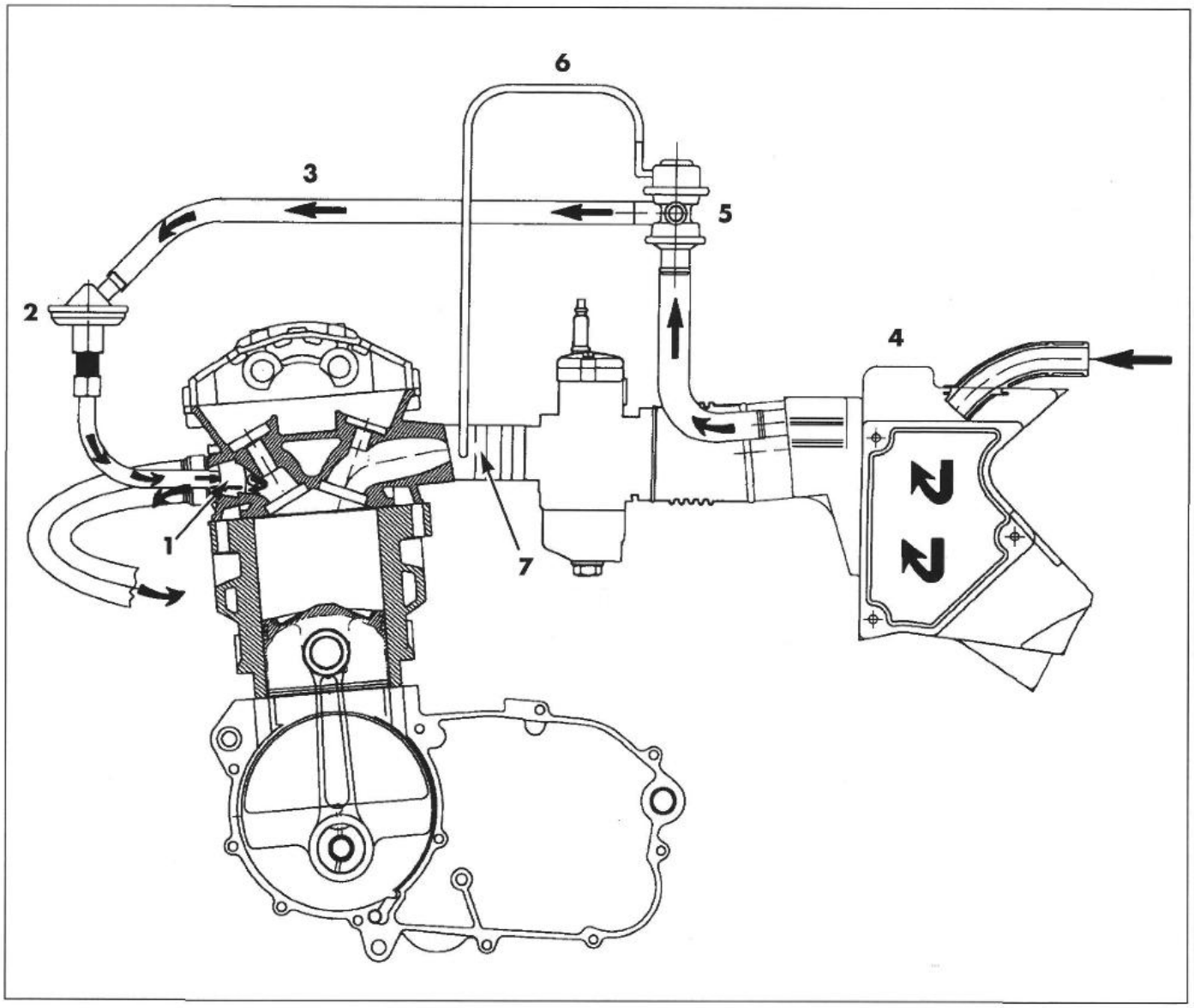
1.5 Changing the oil filter

Replace the oil filter when changing the engine oil.

- Press the foot brake pedal and place a screwdriver or similar between foot brake pedal and stopper roll so that the oil filter cover is more accessible.
- Remove banjo bolt ❺ and the three screws.
- Remove oil filter cover ❻ and oil filter.
- Clean filter housing, oil filter cover, and sealing surfaces. Check oil duct in oil filter cover if clogged.



- Check the O-ring ❼ for damage. O-rings need not be replaced unless damaged.
- Press the O-ring into the groove of the filter cover. Mount a new oil filter ❽ on the connection piece of the oil filter cover an mount the whole unit.
- Mount three screws and tighten with 5 Nm (5 ft.lb)).
- Mount hollow screw with seal rings and tighten with 15 Nm (11 ft.lb).
- Start engine and check oil system for leakage.



1.6 Secondary air system (SLS)

When the exhaust valve is open, the hot exhaust gases flow through the exhaust port ❶ at a very high speed. As a consequence of the flow conditions in the exhaust port and due to the influence exerted by the entire exhaust system on the escaping gases, the pressure in the exhaust port drops temporarily (underpressure).

During these cyclic underpressure phases, the secondary air valve ❷ opens, thus adding oxygen of the air to the hot exhaust gases through pipe ❸. At higher engine speeds, the secondary air valve interrupts the oxygen supply to prevent overheating of the catalytic converter. Additionally, the secondary air valve prevents the exhaust gases from flowing back into the air filter box ❹.

When the motorcycle is pushed (high underpressure in the intake port) the control valve (ASV) ❺ interrupts the air flow into the exhaust port to prevent exhaust detonations.

The control valve is controlled via a control pipe ❻. This control pipe transmits the underpressure from the intake port ❼ to the control valve. During normal operation (slight underpressure in the intake port), the control valve is open.

The reaction between the oxygen of the air and the harmful components of the exhaust gases (CO - carbon monoxide, HC - hydrocarbon) reduces the content of harmful substances by approximately 50%. The use of a catalytic converter, in combination with the SLS, allows an additional significant reduction of pollutant emissions.

1.7 Special tools

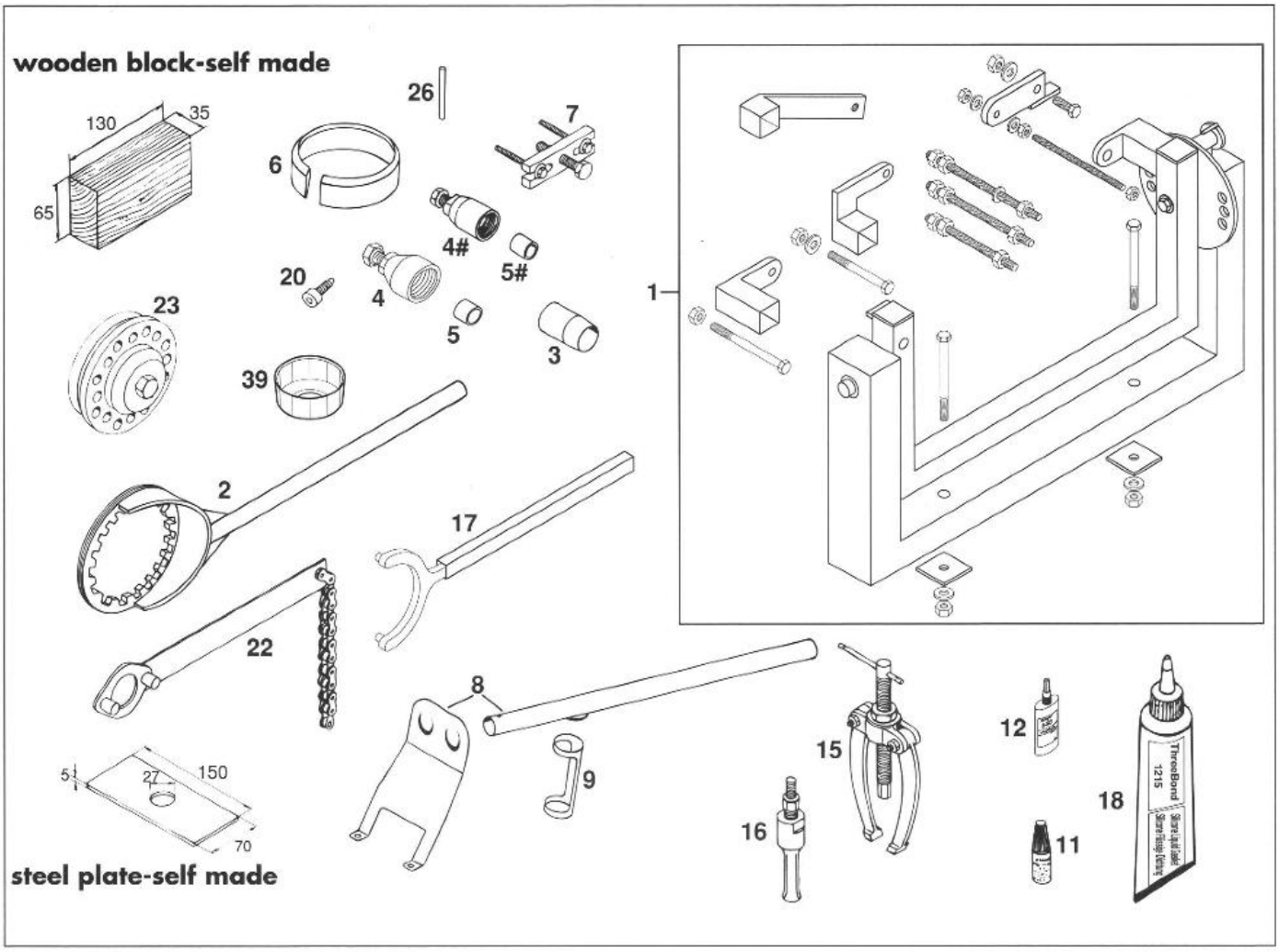
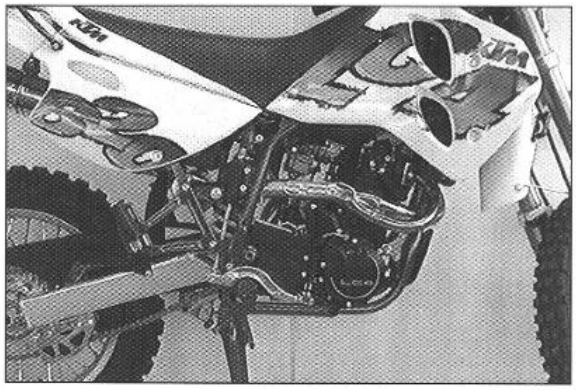


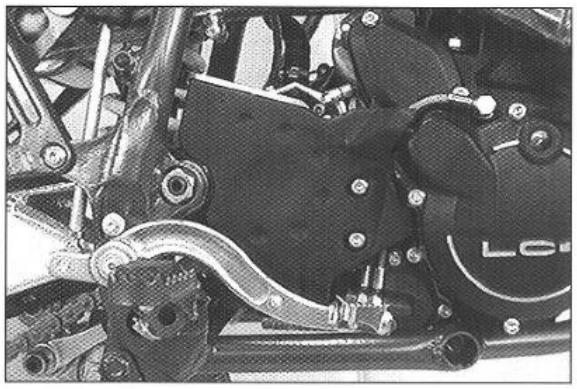
FIG.	PART NO.	DESCRIPTION
1	560.12.001.000	Universal engine work stand
2	583.29.003.000	Clutch holder
3	580.12.005.025	Mountin sleeve Ø 25 mm
4	584.29.009.000	Magneto extractor (Kokusan)
4#	580.12.009.000	Magneto extractor (SEM)
5	510.12.016.000	Protection cover for crankshaft (SEM)
5#	584.29.031.000	Protection cover for crankshaft (Kokusan)
6	580.12.015.089	Piston ringspanner Ø 89 mm (400 ccm)
	580.12.015.101	Piston ringspanner Ø 101 mm (620 ccm)
7	580.12.021.000	Extractor for primary gear and clutch hub
8	580.12.019.000	Valve mounting set
9	6.276.470	Valve spring-push insert
11	6.899.785	Loctite 242 (blue)
12	584.29.059.000	Loctite 648 (red)
15	151.12.017.000	Gear puller
16	151.12.018.000	Internal bearing puller 12-16 mm
16	151.12.018.100	Internal bearing puller 18-23 mm
17	584.29.012.000	Flywheel holding spanner
18	090.98	Seal (Three-Bond)
20	580.30.080.000	Crankshaft locking bolt
22	510.12.012.000	Chain sprocket holder
23	546.29.027.000	Clutch rivetting tool
26	580.29.026.007	Limit plug gauge Ø 7,05 mm
39	583.29.039.000	Oil filter wrench

2.0 Removing engine, Refitting engine



2.1 Removing engine

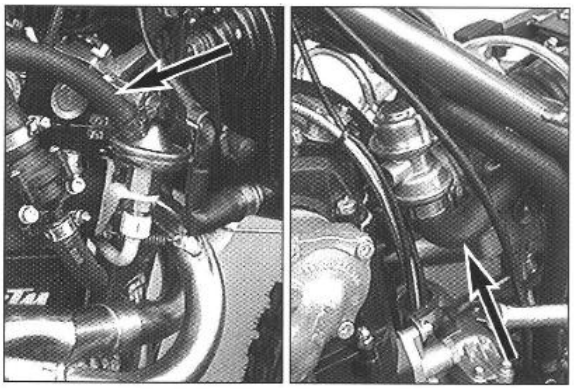
- Clean motorcycle.
- Remove seat, side covers, and fuel tank with spoiler.
- Drain cooling liquid and disconnect radiator hoses.



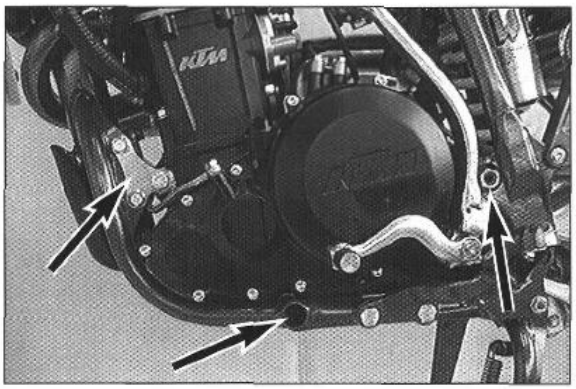
- Remove exhaust manifold and carburetor.
- Remove chainguard and chain damping plate.
- Open pin and socket connection and remove chain.

Disconnect the following electric connections:

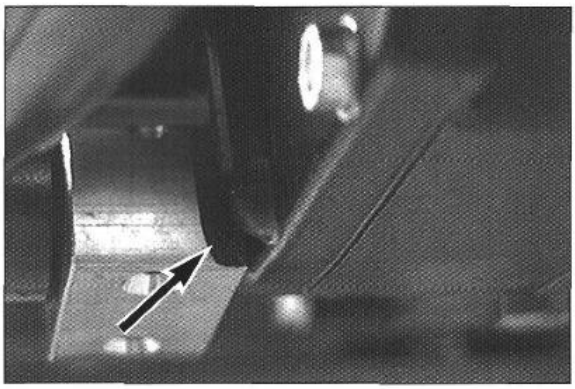
- Negative pole of the battery
- Spark plug connector
- Neutral switch cable
- Temperature sensor cable
- Combination plug of the ignition system
- Positive cable of electric starter motor



- Disconnect the secondary air valve hose.
- Disconnect the exhaust control valve hose.



- Disconnect cables, vent pipes and oil lines.
- Remove engine screws, engine supports, and swing arm pivot and carefully take engine out of the frame on the right side.



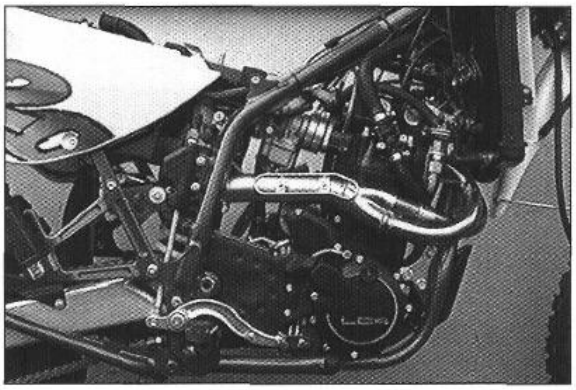
2.2 Refitting engine

- Fit the engine into the frame from the right side.
- Mount swingarm pivot (do not forget the brake hose guide).
- Mount engine supports and engine screws.

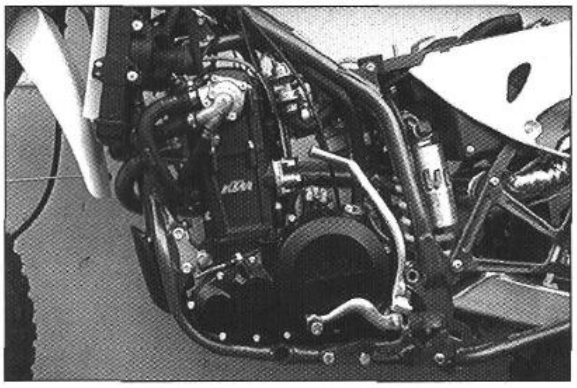
TIGHTENING TORQUES:	SWING ARM PIVOT	100 NM	(74 FT.LB)
	ENGINE SCREWS M8	30 NM	(22 FT.LB)
	ENGINE SCREWS M10	50 NM	(37 FT.LB)

! CAUTION !

IN SC MODELS. THE RIGHT ENGINE DISTANCE IS CUT OUT ON THE INSIDE. WHEN MOUNTING, MAKE SURE THAT THIS OPENING FACES THE ENGINE.



- Mount carburetor, exhaust manifold and chain.
- Connect all electric lines.
- Mount chain damping plate with engine sprocket cover.

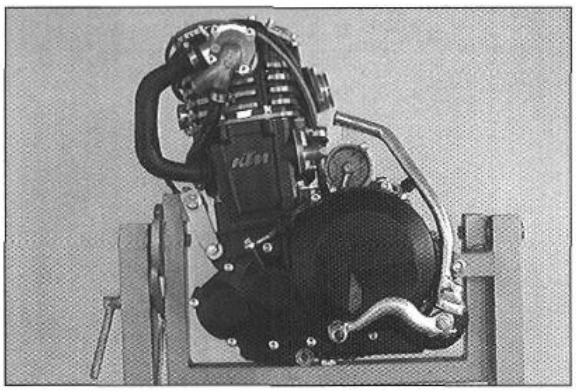


- Hook in cables and adjust.
- Connect oil lines and vent hoses.
- Connect hoses of the cooling system and fill cooling system with a mixture of 60% water and 40% antifreezer.

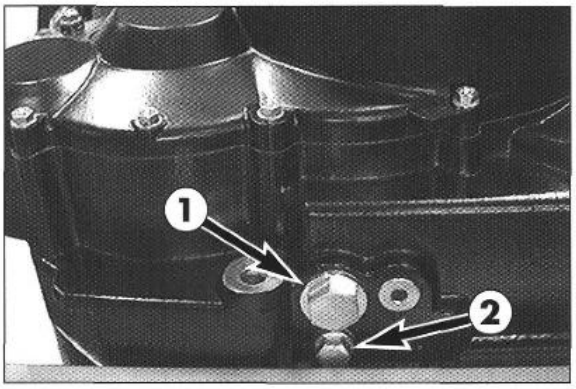
- Fit fuel tank with spoiler, side covers and seat.
- Start the engine and bleed oil system (SX- and SC-models: bleed microfilter. EGS-models: bleed front pipe of the frame).
- Check the cooling system for leaks.
- Check electric system for proper functioning.
- Set the carburetor
- Test ride

- Afterwards, check engine and cooling system for leaks and adjust all liquid levels.

3.0 Dismantling engine

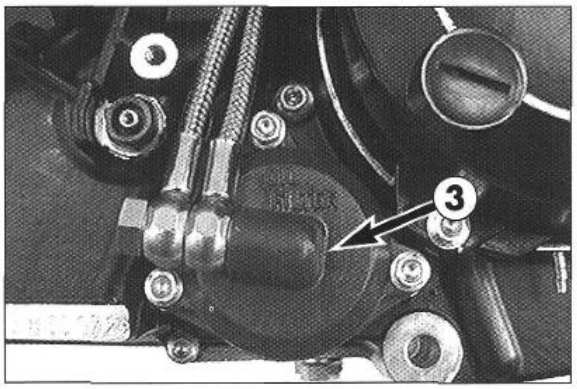


- Fit engine to engine work stand.
- Remove shift lever and kickstarter.
- Remove the spark plug.

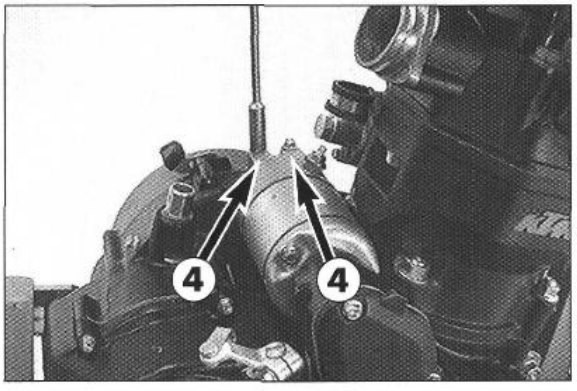


3.1 Drain engine oil

- Remove oil drain plug ❶ and magnetic plug ❷ and drain oil.

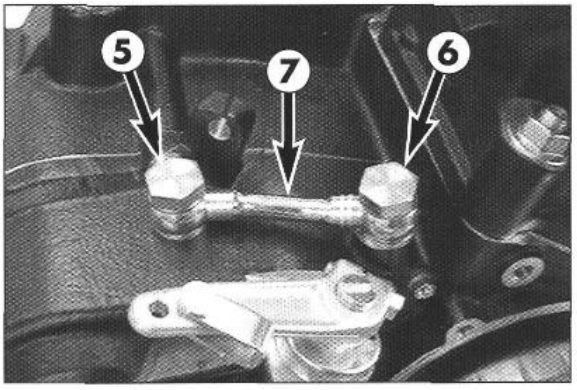


- Detach oil lines and remove oil filter cover ❸.
- Take the oil filter out of the housing.



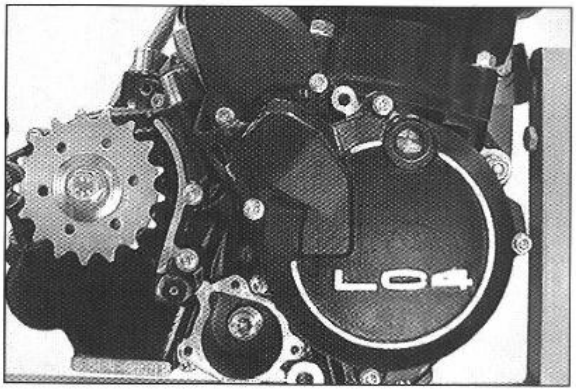
3.2 Electric starter motor

- Undo 2 screws ❹ and remove the electric starter motor from the flange.



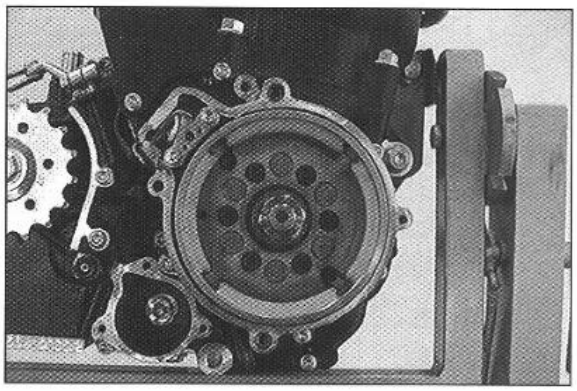
3.3 Oil line (SX)

- Unscrew banjo bolts ❺ and ❻ and remove oil line ❼.

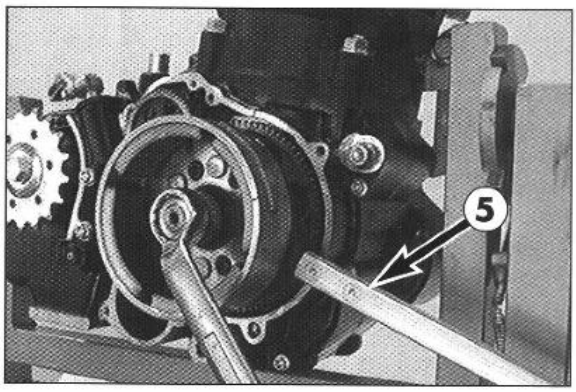


3.4 Ignition (Kokusan)

- Undo 4 screws and remove the ignition cover with the stator incl. gasket.



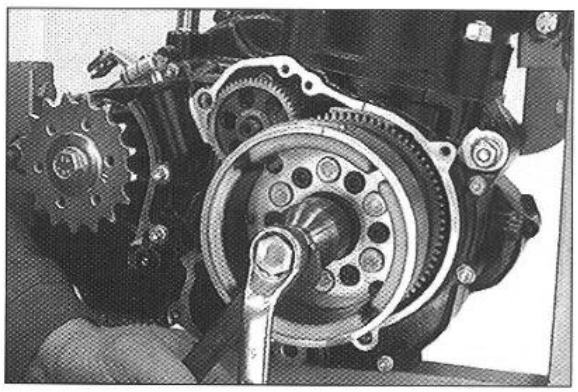
- Undo 5 screws.
- Remove starter flange incl. gasket.



- Insert the holding spanner ❺ (584.29.012.000) into the 2 bores of the flywheel.
- Hold the flywheel and remove the hexagon nut.
- Remove the disc.

! CAUTION !

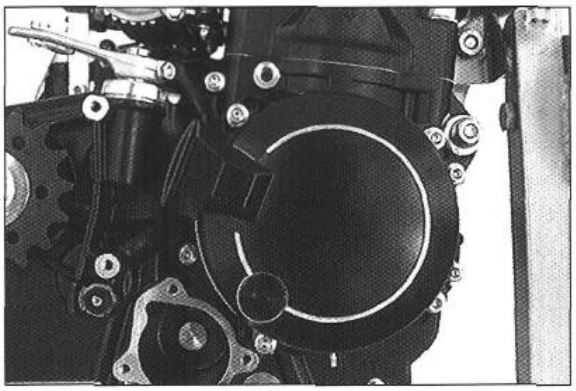
TO AVOID DISTORTION OF THE CRANK WEB, NEVER MOUNT THE CRANKSHAFT LOCKING BOLT TO STEADY THE FLYWHEEL.



- Mount the extractor (584.29.009.000) and pull off the flywheel. Use protective sleeve (584.29.031.000).
- Take the woodruff key out of the crankshaft.

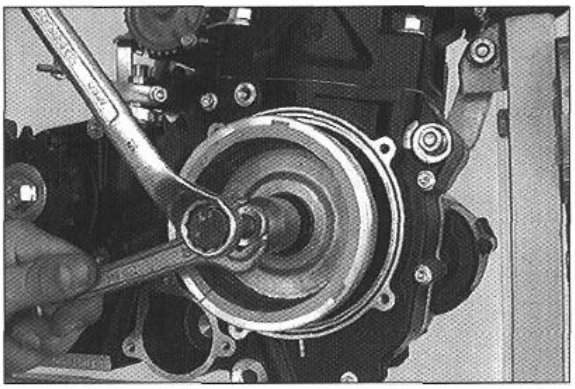
! CAUTION !

NEVER USE A HAMMER OR ANY OTHER TOOL ON THE FLYWHEEL TO AVOID LOOSENING OF THE MAGNETS.



3.4.1 Ignition (SEM)

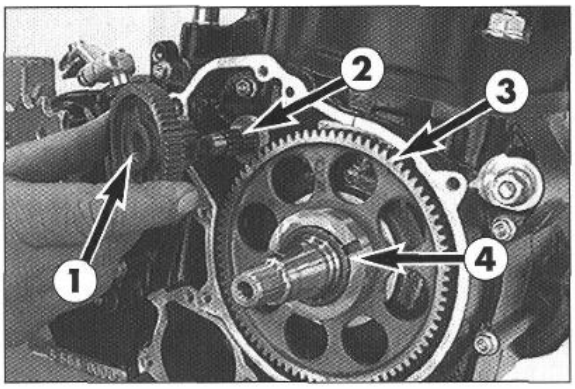
- Undo the 4 screws and remove ignition cover and O-ring.
- Block the crankshaft (see 3.7).



- Unscrew collar nut (left hand thread) and remove spring disc.
- Fit extractor (580.12.009.000) and pull off flywheel. Use protective sleeve (510.12.016.000).
- Remove woodruff key from the crankshaft.
- Twist the crankshaft locking bolt out until the crankshaft is no longer blocked.

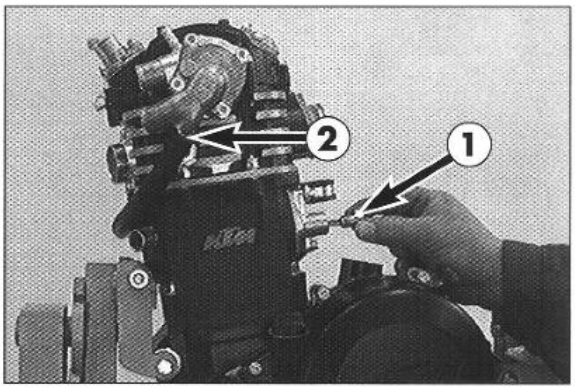
! CAUTION !

NEVER USE A HAMMER OR ANY OTHER TOOL ON THE FLYWHEEL TO AVOID LOOSENING OF THE MAGNETS.



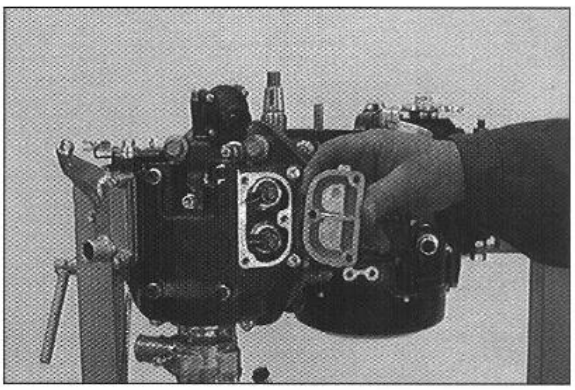
3.5 E-Starter drive

- Take the reduction gear ❶ off the shaft.
- Remove the needle bearings ❷.
- Remove the freewheel gear ❸ and the needle bearing ❹.



3.6 Cylinder head top section

- Unscrew plug ❶ with gasket and remove pressure spring from automatic tensioner.
- Remove connection hose ❷ (water pump - thermostat).

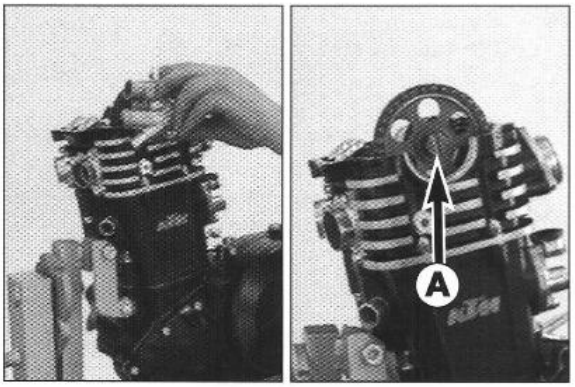


- Remove both valve covers including gaskets.
- Then remove the 11 screws.
- Detach the cylinder head top section.

! CAUTION !

WHEN REMOVING CYLINDER HEAD TOP SECTION DO NOT CHOCK IT. THIS WOULD DAMAGE THE HOUSING OF THE WATER PUMP.

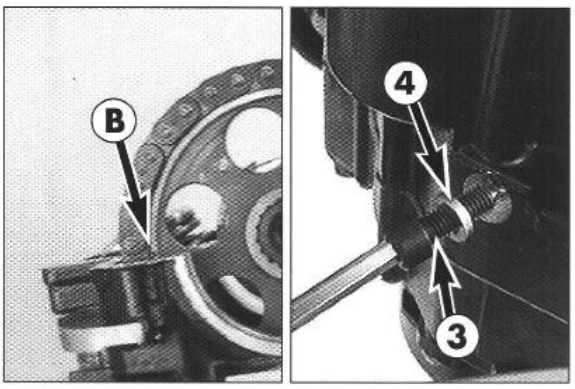
NOTE: THE CONTROL VALVE OF SLS MODELS CAN BE REMOVED AFTER UNDOING THE SCREWS OF THE CYLINDER HEAD TOP SECTION.



- Pull water pump upward and simultaneously turn crankshaft.

NOTE: WHEN GROOVE ❹ IN THE HH SCREW IS VERTICAL, THE WATER PUMP CAN BE PULLED UPWARD AND TAKEN OUT OF THE CYLINDER HEAD WITHOUT THE APPLICATION OF FORCE.

3.7 Blocking the crankshaft

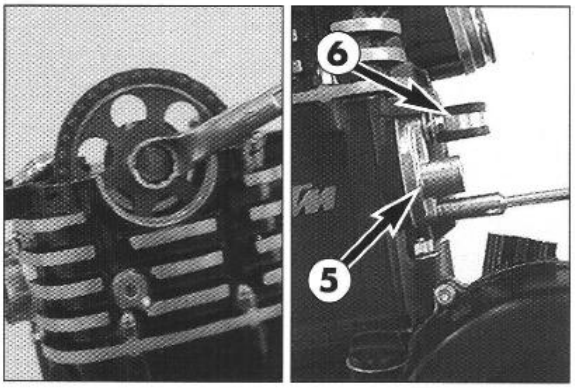


- Turn the piston to position TDC (mark ❸ must coincide with the plane surface of the cylinder head).
- Undo the crankshaft locking bolt ❸.
- Remove the copper disc ❹.
- Reinsert crankshaft locking bolt by hand.
- If the screw does not slide smoothly into its bore, slightly move the camshaft gear (if cylinder head top section is mounted turn the flywheel) back and forth until the crankshaft locking bolt engages in its bore.
- Tighten crankshaft locking bolt with 25 Nm (18 ft.lb).

! CAUTION !

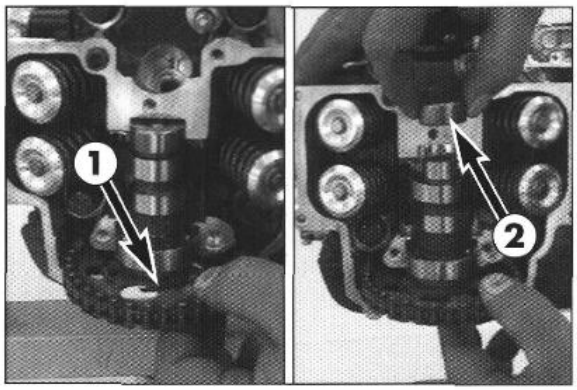
UNDER NO CIRCUMSTANCES APPLY FORCE TO SCREW IN CRANKSHAFT LOCKING BOLT AS THIS WILL DAMAGE THE CRANKSHAFT.

NOTE: SX MODELS COME WITH A SPECIAL SCREW (M8x10) MOUNTED INSTEAD OF THE CRANKSHAFT LOCKING BOLT. A CRANKSHAFT LOCKING BOLT IS SUPPLIED SEPARATELY WITH THESE MODELS.

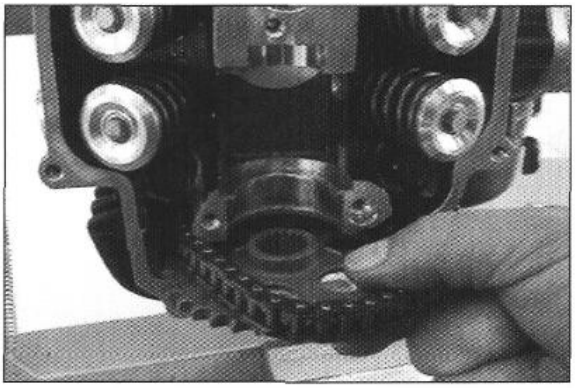


3.8 Camshaft

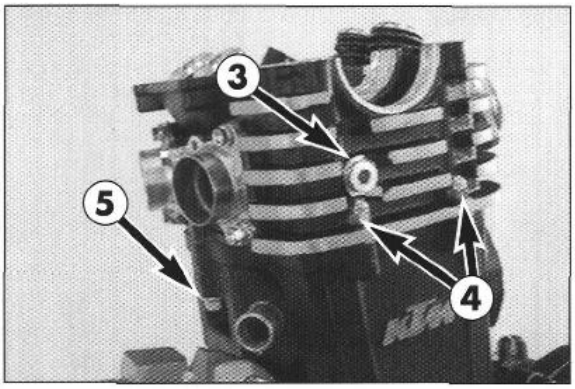
- Release the HH screw from the camshaft gear.
- Remove the two allan head screws and take off the automatic tensioner ❺ and the clamp ❻.



- Using a screwdriver, lever circlip ❶ out of the groove.
- Tilt camshaft and remove needle bushing ❷.
- While tilted, pull camshaft from camshaft gear and remove together with grooved ball bearing and circlip.

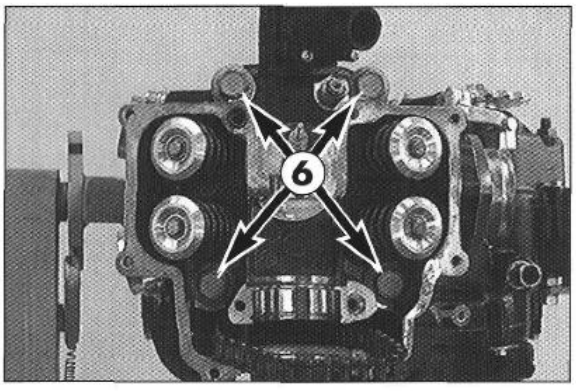


- Remove camshaft gear wheel from timing chain.

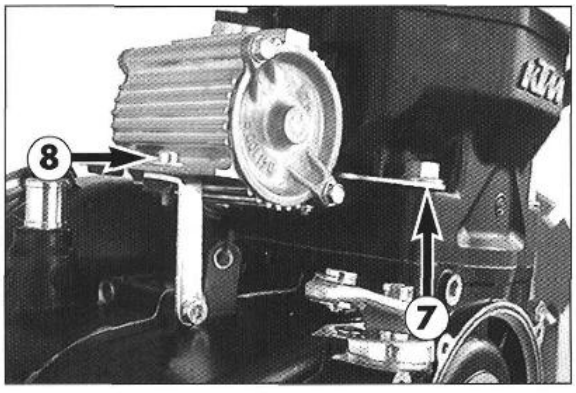


3.9 Cylinder head

- Unscrew chain guide screw ❸, cap nuts ❹ and collar nuts ❺.



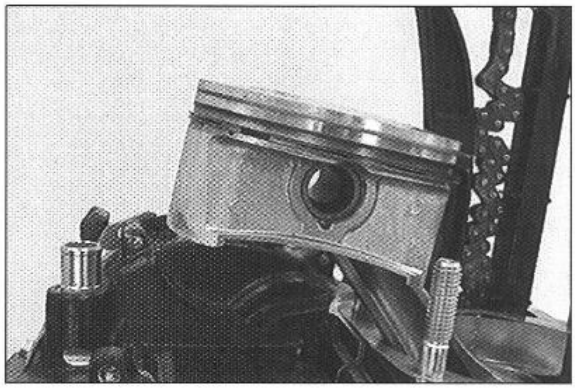
- Unscrew the 4 collar screws ❻ and detach cylinder head with gasket.



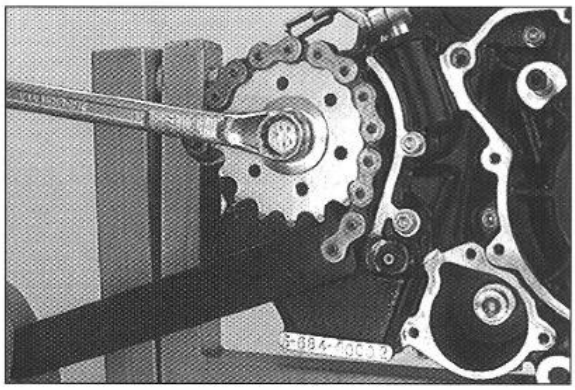
3.10 Cylinder, Piston

- Unscrew the 4 collar nuts at the cylinder base ❼.
- Remove the allan head screw ❽.
- Unscrew the oil line at the clutch cover and remove the microfilter including holding device.
- Remove cylinder and cylinder base gasket.

NOTE: MICROFILTER ONLY FOR SX AND SC-MODELS.



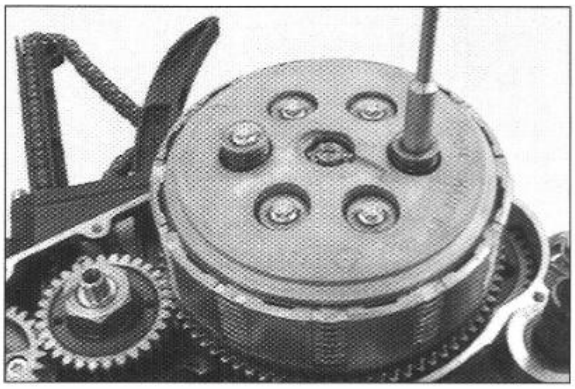
- Remove wire circlip and press piston pin out of piston.
- Remove piston.



3.11 Engine sprocket

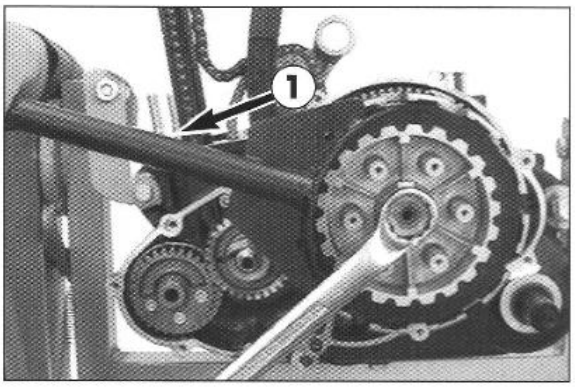
- Remove collar screw and spring washer.
- Remove the sprocket from the counteshaft.
- Remove the distance bushing from the countershaft.

NOTE: IF THE GEAR-BOX AND THE CLUTCH OF THE ENGINE ARE IN GOOD CONDITION, THROW IT INTO GEAR IN ORDER TO BLOCK THE TAKE-OFF SHAFT (FRICTIONAL CONNECTION TO THE BLOCKED CRANKSHAFT IS PRESENT). IF THE TAKE-OFF SHAFT CANNOT BE BLOCKED AS DESCRIBED ABOVE, A CHAIN SPROCKET HOLDER (510.12.012.000) MUST BE APPLIED FOR THE REMOVAL OF THE CHAIN SPROCKET NUT (SEE ILLUSTRATION).

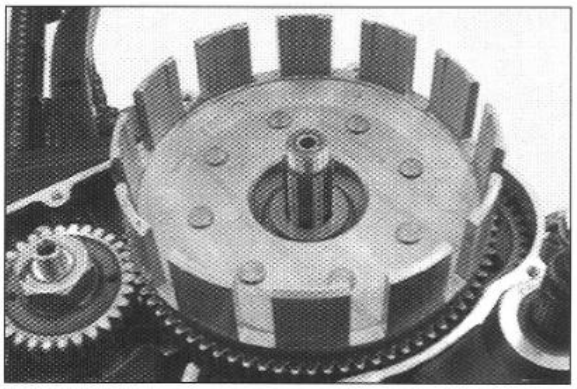


3.12 Clutch, primary drive

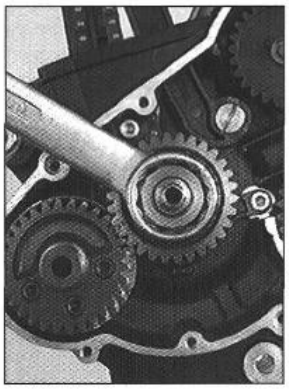
- Remove the 11 screws and detach clutch cover with gasket.
- Unscrew the HH screws of the clutch crosswise to prevent the clutch discs from jamming when the springs are relieved of tension.
- Remove HH screws, spring retainer and springs.
- Remove pressure cap with push rod.
- Remove disk stack.

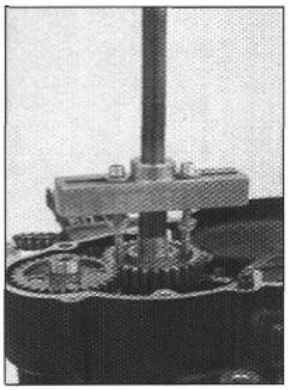


- Release the lock washer of the inner clutch hub.
- Put the clutch holder ❶ (583.29.003.000) onto the inner clutch hub and loosen the hexagon nut (see illustration).
- Remove the clutch holder.
- Take the inner clutch hub off the shaft.

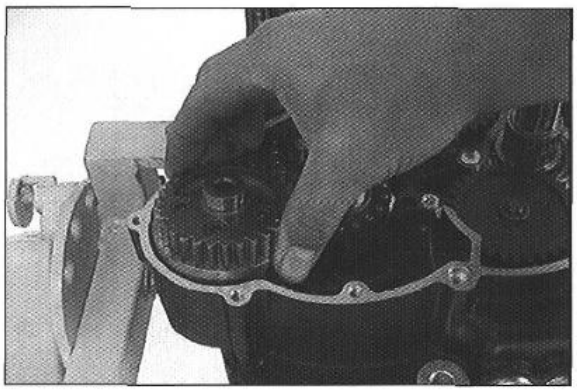


- Try to turn the outer clutch hub in both directions to check the absorbing elements. Dead travel in either direction is inadmissible.
- Remove both the outer clutch hub and the bearing from the main shaft.



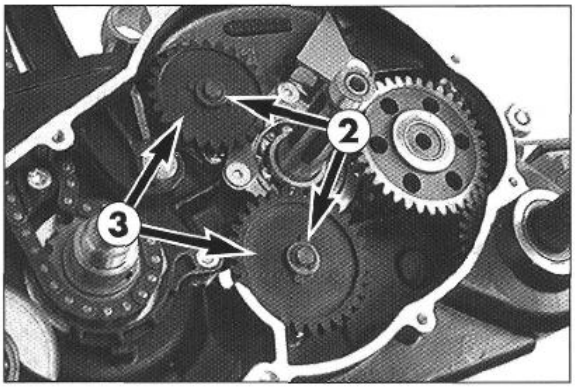


- Unscrew hexagon nut of primary gear wheel and detach spring washer from the crankshaft.
- Fit extractor for primary gear and pull off primary gear.



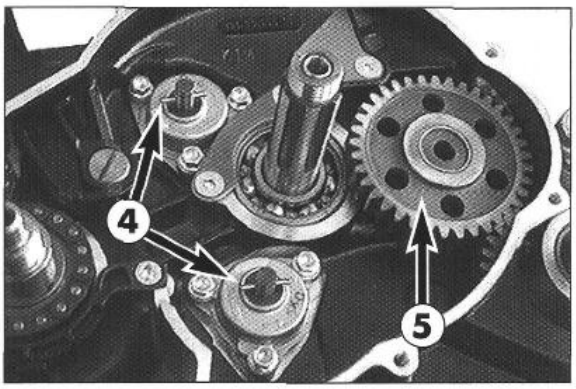
- Remove the balancer shaft from the bearing by hand.

3.13 Oil pumps

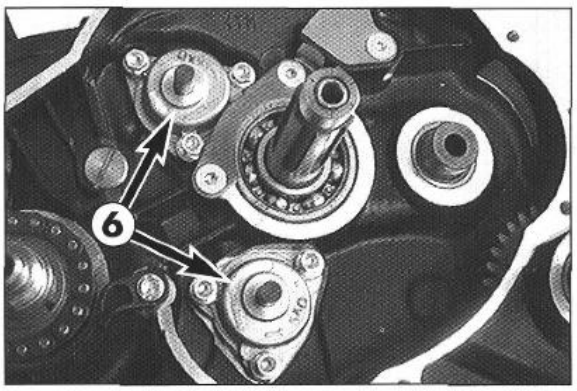


- Remove the locking washers ❷ of both oil pumps.
- Remove the oil pump gears ❸ and stop discs.

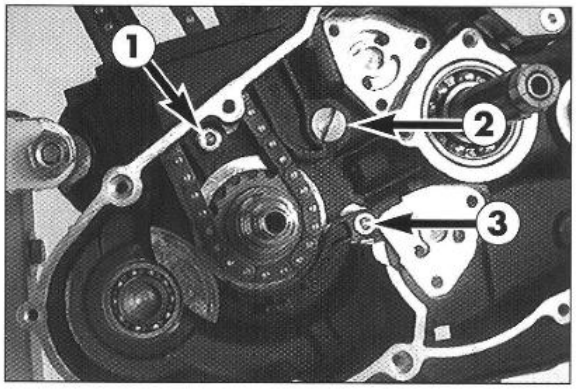
NOTE: SX MODELS HAVE ONLY ONE OIL PUMP.



- Remove the needle rollers ❹ and stop discs from the oil pumps.
- Remove the kickstarter intermediate gear ❺.

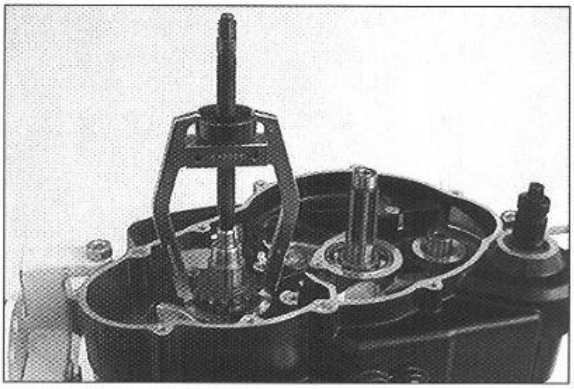


- Twist out the 6 screws and remove the oil pumps ❻ from the housing.

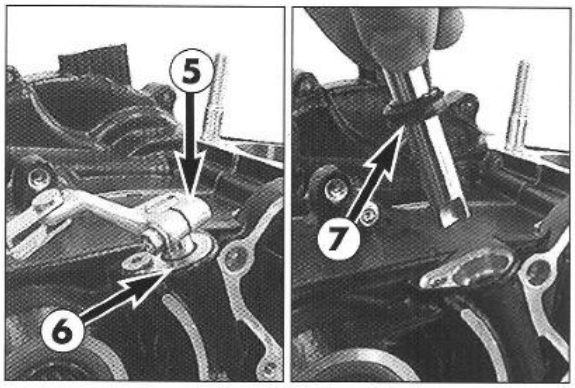


3.14 Timing chain, timing gear

- Remove allan head screw ❶ and remove timing chain guide from the casing.
- Unscrew flat-head screw ❷ and remove timing chain tensioner.
- Unscrew allan head screw ❸ and remove timing chain securing guide.
- Insert timing chain into the clutch compartment of the engine housing and disengage from timing gear.



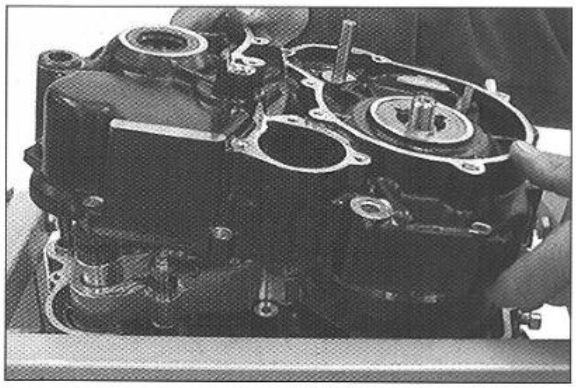
- Remove the primary gear woodruff key from the crankshaft.
- Withdraw the timing pinion from crankshaft with a 2-jaw puller.



3.15 Clutch release shaft

- Loosen the clamp screw and remove the clutch release lever ❺.
- Remove the screw and take off the retaining bracket ❻.
- Pull the clutch release shaft out of the housing.
- Remove the grooved ring ❼.

NOTE: MODELS WITHOUT ELECTRIC STARTER ARE PROVIDED WITH 2 CLAMP SCREWS TO FIX THE CLUTCH RELEASE SHAFT. THE REST OF THE EQUIPMENT IS IDENTICAL.



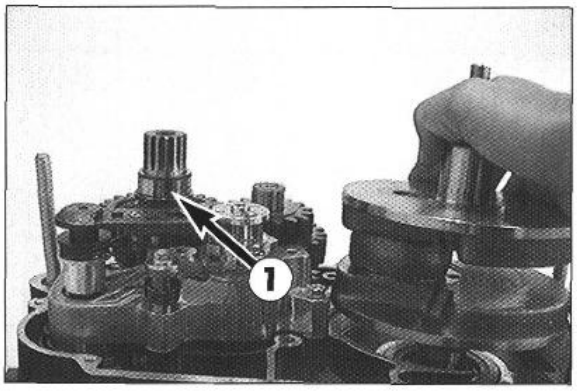
3.16 Parting of engine housing

- Tip ignition side upwards and remove housing screws.
- Release engine mount on engine repair stand.
- Lift right hand housing half with suitable tools bearing on the bosses provided, or part with a few light plastic mallet blows against the counter shaft.

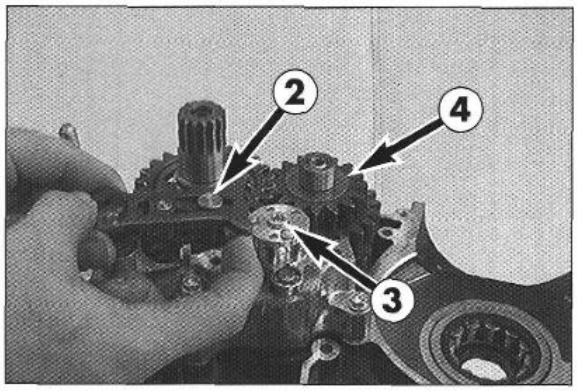
! CAUTION !

LEVERING APART WITH A SCREW-DRIVER OR SIMILAR TOOL MUST BE AVOIDED, SINCE THE SEALING SURFACES ARE EASILY DAMAGED.

- Remove housing-half and gasket.
- Keep a watch on the main shaft stop disc (it may clying inside the housing).

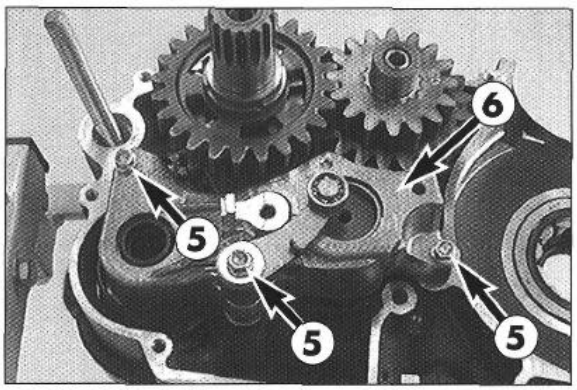


- Loosen the crankshaft locking bolt and remove crankshaft from housing.
- Remove the O-ring and the internal ring ❶ of the roller bearing as well as the O-ring below from the countershaft.

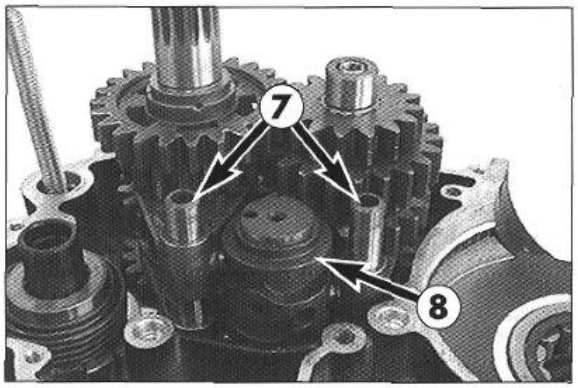


3.17 Shift mechanism

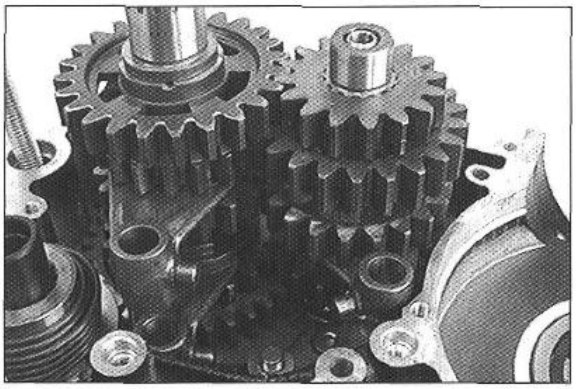
- Push back slide plate ❷ and pull shift shaft out of the kickstarter shaft.
- Remove allan head screw ❸ and detach locking piece.
- Remove the stop disc ❹.



- Remove the 3 screws ❺.
- Detach the shift mechanism support ❻.

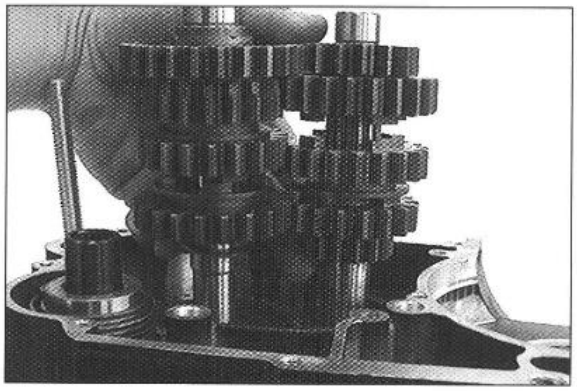


- Pull out the shift rails ❼ and turn the shift forks sideways.
- Remove shift roller ❽.



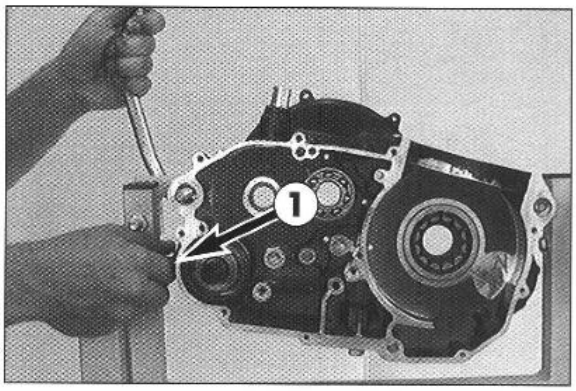
- Remove shift forks.

NOTE: ALTHOUGH THE COUNTER SHAFT SHIFT FORKS ARE IDENTICAL THEY SHOULD BE REFITTED IN THE SAME POSITION AS BEFORE IF REUSED. THEREFORE MARK ACCORDINGLY UPON REMOVAL.



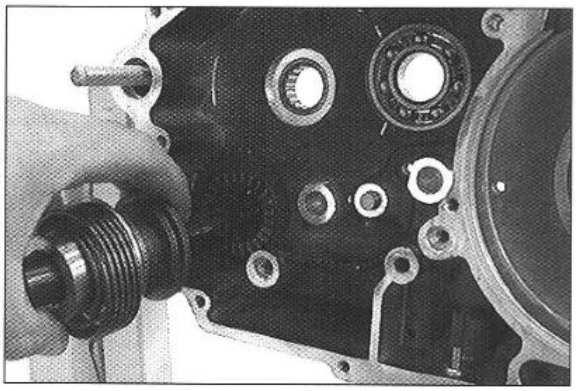
3.18 Transmission

- Remove transmission shafts from the bearings.
- Remove 1st gear idler gear with needle bearing and stop disk from housing.



3.19 Kickstarter

- Put kickstarter onto kickstarter shaft and hold in this position.
- Unscrew stop screw ❶ and relieve starter spring tension by releasing the kickstarter.



- Remove kickstarter shaft assembly from housing.
- Remove starter wheel and ratchet gear from housing, paying attention to the two stop disks.
- Clean all parts and check for wear, replace if necessary.

NOTE: WHEN AN ENGINE IS COMPLETELY OVERHAULED IT IS RECOMMENDED THAT ALL GASKETS, SHAFT SEAL RINGS, O-RINGS AND, POSSIBLY, ALL BEARINGS ARE RENEWED.

4.0 Servicing on individual components

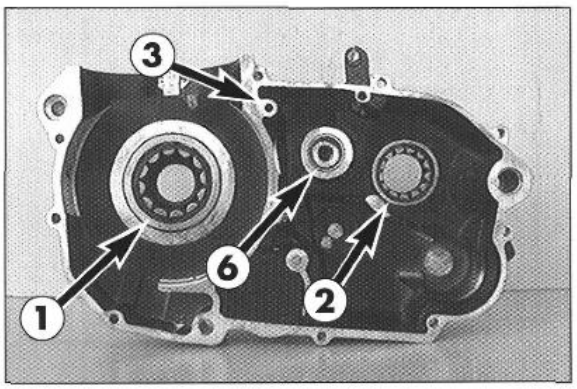
Engine housing

NOTE: READ THROUGH THE FOLLOWING SECTION BEFORE COMMENCING WORK. THEN DETERMINE THE ASSEMBLY SEQUENCE SO THAT THE ENGINE HOUSING HALVES ONLY NEED TO BE HEATED UP ONCE BEFORE REPLACING THE BEARINGS.

HAVING FIRST REMOVED THE DOWELS, IN ORDER TO EXPEL THE BEARINGS OR REMOVE THEM WITH LIGHT MALLET BLOWS, THE HOUSING HALVES MUST BE PLACED ON A SUITABLY LARGE PLANE SURFACE, SUPPORTING THE WHOLE OF THE SEALING SURFACE WITHOUT DAMAGING IT. A WOODEN PANEL IS BEST USED AS A BASE.

BEARINGS OR SHAFT SEAL RINGS SHOULD NOT BE HAMMERED INTO THEIR SEATS. IF NO SUITABLE PRESS IS AVAILABLE, USE A SUITABLE MANDREL AND HAMMER THEM IN WITH GREAT CARE. COLD BEARINGS WILL PRACTICALLY DROP INTO THEIR SEATS AT AN ENGINE HOUSING TEMPERATURE OF APPROX. 150° C.

AFTER COOLING, SHOULD THE BEARINGS FAIL TO LOCK IN THE BORE, THEY ARE BOUND TO ROTATE AFTER WARMING. IN THAT EVENT THE HOUSING MUST BE REPLACED.



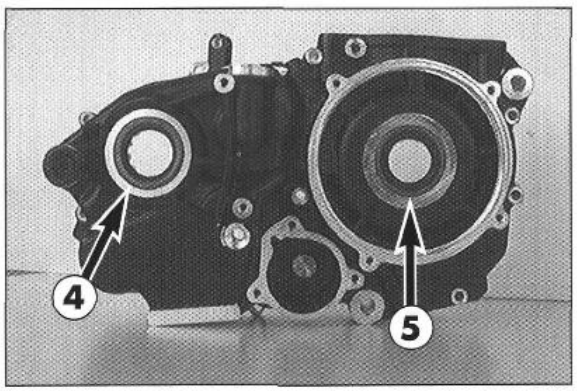
4.1 Right housing half

Remove shaft seal rings and heat housing half to approx. 150° C by means of a hot-plate.

ROLLER BEARING OF CRANKSHAFT ❶
Proceed as for left housing half.

CYLINDER ROLLER BEARING OF COUNTER SHAFT ❷
Remove shaft seal ring. Press old bearing inwards. Press in new bearing from inside as far as stop.

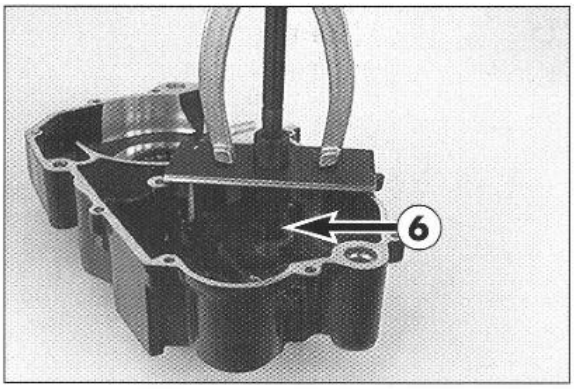
OIL DUCTS ❸
Use compressed air to clean all oil ducts. Ensure that the oil ducts are not clogged.



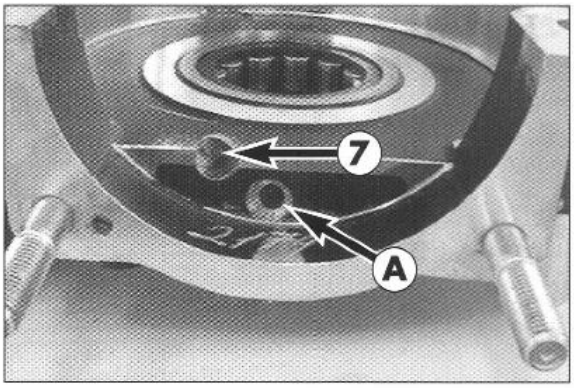
COUNTER SHAFT SEAL RING ❹
Press in new shaft seal ring from outside until flush.

CRANKSHAFT SEAL RING ❺
Press in new shaft seal ring from outside until flush.

NOTE: ENGINE WITH AN ELECTRIC STARTER HAVE A STOP DISK INSTEAD OF THE SHAFT SEAL RING ❺. DO NOT REMOVE THIS DISK.

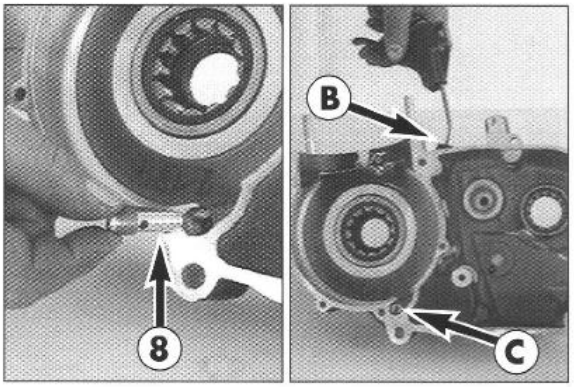


NEEDLE BEARING OF MAIN SHAFT ❻
Pull old bearing from bearing seat using bearing extractor (151.12.017.000) and insert (151.12.018.100). In order to apply the bearing extractor in an vertical position, a steel plate (see special tools) must be laid on the sealing area of the housing. The bearing extractor jaws should fit as close as possible up to the housing walls. Then press in new bearing from inside until flush.



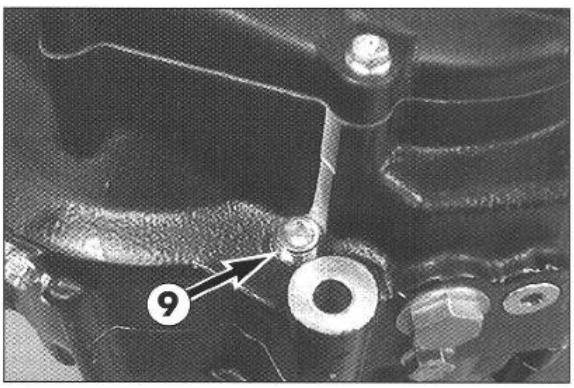
OIL NOZZLE ❼
For the cleaning of the oil nozzle and the oil duct simply blow it through with compressed air from the nozzle side. If the oil nozzle is disassembled, secure it with Loctite 242 when mounting again.
Then check the LUBRICATION BORE Ⓐ of the crankshaft roller bearing for free passage.

After the case half has cooled down, check bearings for secure fit.



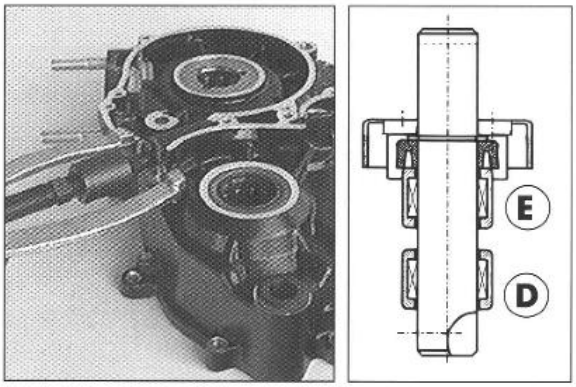
BALL VALVE (SX) ❽
The ball valve prevents the engine oil from flowing back from the transmission into the crankcase.
Remove the ball valve to check it.
Clean the ball valve and the oil duct with compressed air.
Degrease the thread and apply Loctite 242 before reinstalling the ball valve.
Twist the ball valve all the way into its seat and check for tightness.

Cleaning: compressed air from Ⓒ to Ⓑ
Testing for tightness: compressed air from Ⓑ to Ⓒ - compressed air may not escape from Ⓒ.



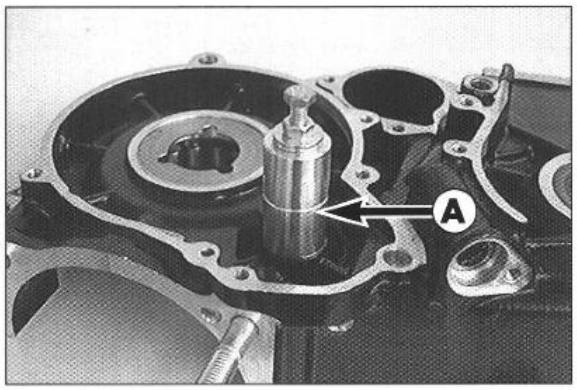
NOTE: BALL VALVES CAN BE REPLACED WITHOUT REMOVING THE ENGINE.

- Remove plug ❾
- Use a screw driver to remove the ball valve.
- Clean the bore of the ball valve with compressed air.
- Apply Loctite 242 to the thread of the new ball valve and twist the valve all the way into its seat.
- Apply Loctite 242 to the plug and mount the plug.
- Tighten the plug with 20 Nm.

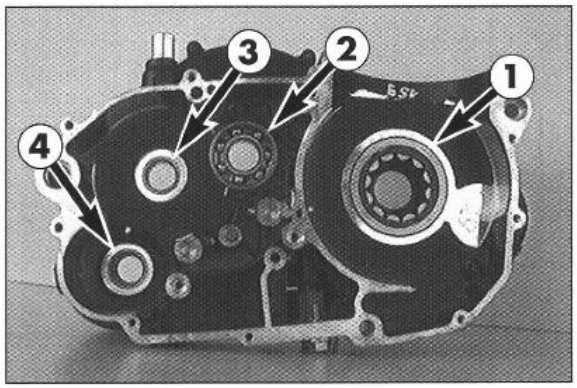


NEEDLE BUSHES OF THE CLUTCH DISENGAGEMENT
- Pull out the needle bushes of the clutch disengagement with a gear puller (151.12.017.000) and insert (151.12.018.000) from the housing half.

- Press the first needle bush Ⓓ to stop.
- Press the second needle bush Ⓔ so that it is flush.



REDUCTION GEAR BEARING BOLT
- Slide the appropriate sleeve Ⓐ over the bearing bolt.
- Twist an M6 screw with nut into the thread of the bearing bolt.
- Hold the screw and remove the bearing bolt by tightening the hexagon nut.
- Insert the new bearing bolt and push it right down.



4.2 Left housing half

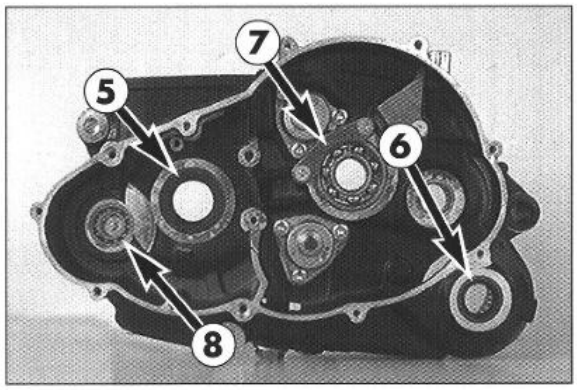
Remove shaft seal rings and heat housing half to approx. 150° C by means of a hot-plate.

ROLLER BEARING OF CRANKSHAFT ❶
From outside press crankshaft roller bearing inwards using a suitable mandrel.
Press in new roller bearing from inside up to the stop.

GROOVED BALL BEARING OF MAIN SHAFT ❷
Press in new grooved ball bearing from inside up to the stop.

! CAUTION !

DO NOT USE FORCE WHEN PRESSING THE GROOVED BALL BEARING AGAINST THE RETAINING PLATE ❼ TO AVOID A BENDING OF THE PLATE, WHICH WOULD RESULT IN EXCESSIVE AXIAL PLAY OF THE MAIN SHAFT.



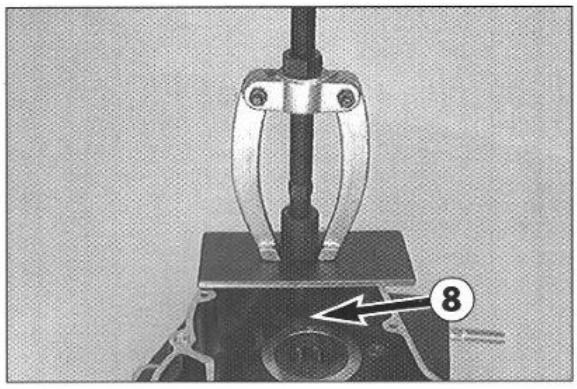
NEEDLE BEARING OF COUNTER SHAFT ❸
Press in new needle bearing from inside until flush.

NEEDLE BEARING OF KICKSTARTER SHAFT ❹
Press in new needle bearing from inside until flush.

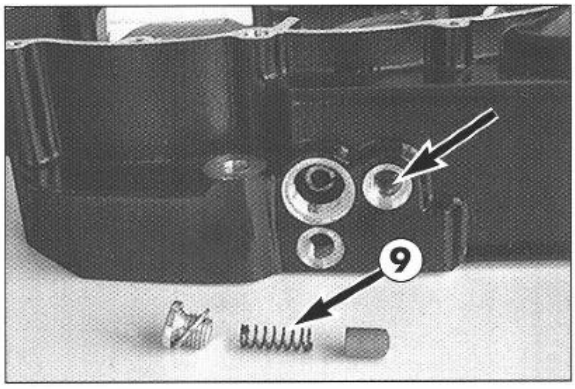
SHAFT SEAL RING OF CRANKSHAFT ❺
Press in new shaft seal ring from outside with sealing lip facing inwards until flush.

SHAFT SEAL RING OF KICKSTARTER SHAFT ❻
Press in new shaft seal ring from outside with sealing lip facing inwards until flush.

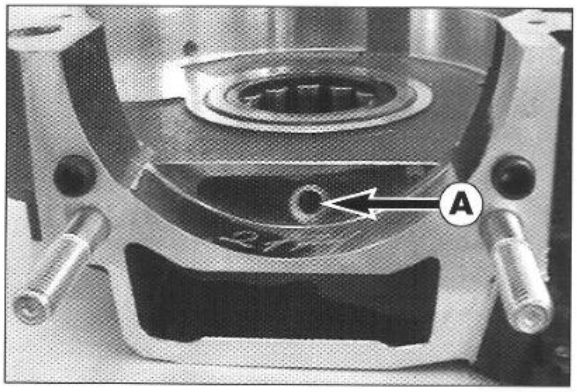
RETAINING PLATE FOR MAIN SHAFT GROOVED BALL BEARING ❼
If the retaining plate has been removed, use Loctite 242 for the two countersunk screws during assembly.



GROOVED BALL BEARING OF THE BALANCER SHAFT ❽.
Use an extractor (151.12.017.000) and insert (151.12.018.100) to remove the grooved ball bearing from the housing half.

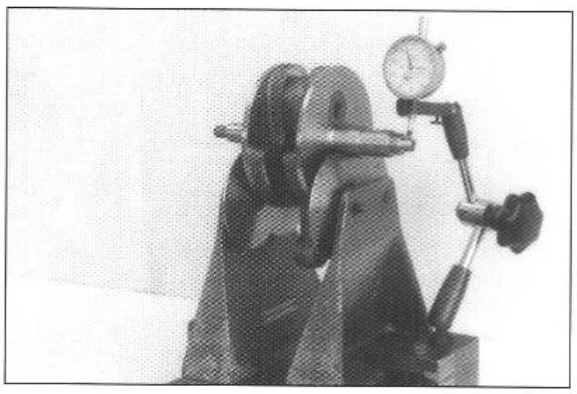


BYPASS VALVE
Test valve piston, tight fit and pressure spring for damage.
Minimum length of the pressure spring ❾ 25 mm (1 in).



Ensure that neither the LUBRICATION BORE of the roller bearing Ⓐ nor the OIL DUCTS of the oil pumps are clogged.

- After the housing half has cooled down, check bearings for tight fit.
- Finally, insert both dowels so that the dowel with internal diameter 15.4 mm (0.63 in) is mounted at the rear (swingarm pivot).



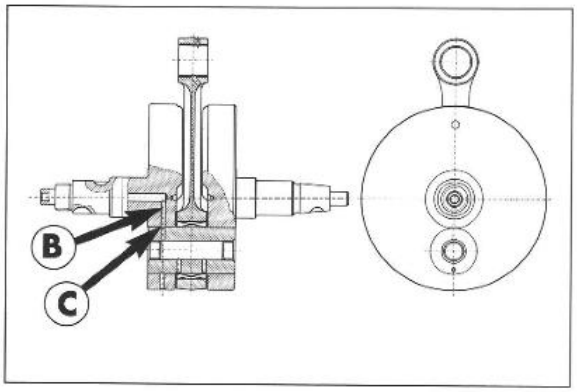
4.3 Crankshaft

If the crankshaft is continued to be used, check crankshaft journals for run out. Place crankshaft on a roller block or a similar device and check the outer end of the journals for run out with a dial gauge.

MAX. RUN OUT OF CRANKSHAFT JOURNALS: 0.04 MM (0.0016 IN)

The radial play and axial play on the conrod bearing must be checked.

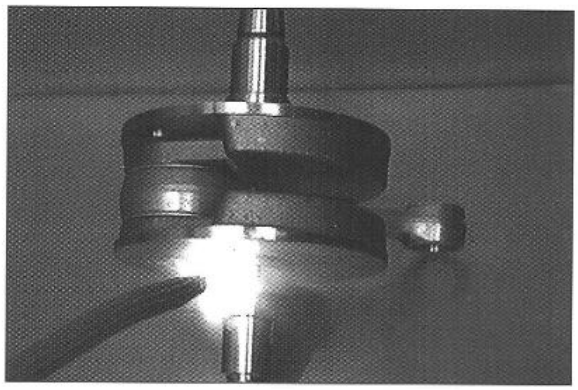
MAX. RADIAL PLAY: 0.05 MM (0.0019 IN)
MAX. AXIAL PLAY: 1.00 MM (0.04 IN)



If the conrod bearing is replaced, take care to properly position the crankpin. The bores of the crank web Ⓑ and crank pin Ⓒ must coincide.

! CAUTION !

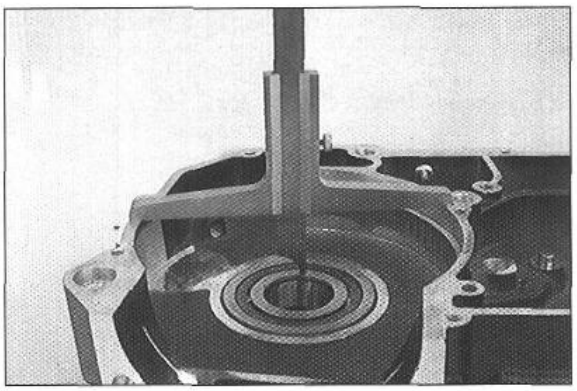
IF THE CRANK PIN IS PRESSED IN THE WRONG POSITION, THE CONROD BEARING IS SUPPLIED INSUFFICIENTLY OR NOT AT ALL WITH ENGINE OIL, WHICH RESULTS IN BEARING DAMAGE.



- If the crankshaft roller bearings are replaced, the inner rings on the crankshaft should also be changed. To do this, warm the inner rings until they fall off. Before new inner rings are pressed on, the axial play of the crankshaft should be measured (see 4.3.1).
- In order to safely press on new rings, a middle panel should be inserted between the crankshaft webs. This panel should be big enough to be supported on both sides, so that the crankshaft lies free and accessible. Warm the inner rings and then press them on.

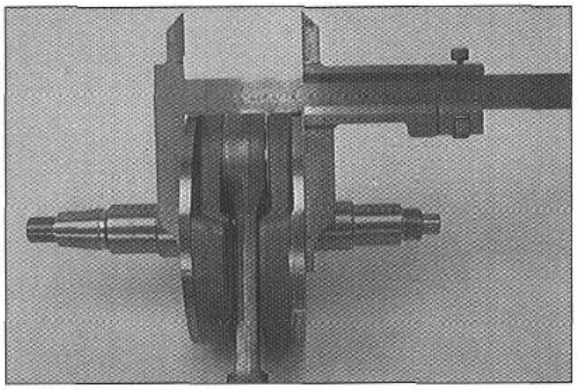
! CAUTION !

NEVER CLAMP THE CRANKSHAFT WITH A CRANKSHAFT JOURNAL OR WEB IN THE VICE, AND NEVER TRY TO KNOCK THE INNER RING FREE. THE CRANKSHAFT WEBS MAY BE COMPRESSED THEREBY MAKING THE CRANKSHAFT UNUSEABLE.



4.3.1 Measuring and adjusting of crankshaft axial play

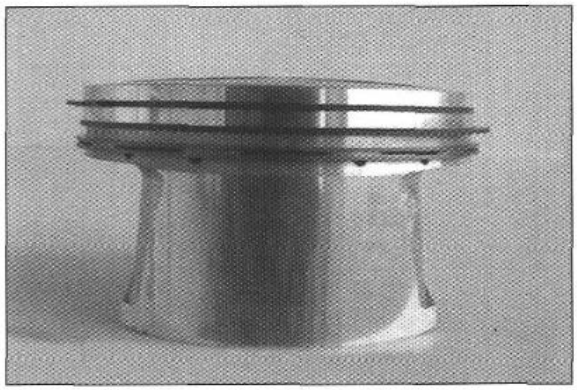
- Should the crankshaft, engine housing, or a roller bearing be replaced, the axial play of the crankshaft should also be checked.
- The housing should be laid inside upwards, then measure the distance from the sealing area to the inner rings of the roller bearings. Note the readings and then add on 0.3 mm to allow for gasket thickness.
- Measure the crankshaft at touching points and then subtract the measured value from the housing dimensions. This figure will be the axial play of the crankshaft, which should be 0.03- 0.12 mm (0.001- 0.005 in).



EXAMPLE:

Left-hand housing half	33.0 mm	1.300 (in)
Right-hand housing half	+ 32.8 mm	1.290 (in)
Gasket	+ 0.3 mm	0.012 (in)
Total housing dimension	= 66.1 mm	2.602 (in)
Crankshaft dimension	– 65.8 mm	2.590 (in)
Axial play present	= 0.3 mm	0.012 (in)

The compensating washers should be equally distributed between the two sides of the crankshaft. In our example, one compensation washer (≠ 0.1 mm / 0.004 in.) must be mounted on either side.

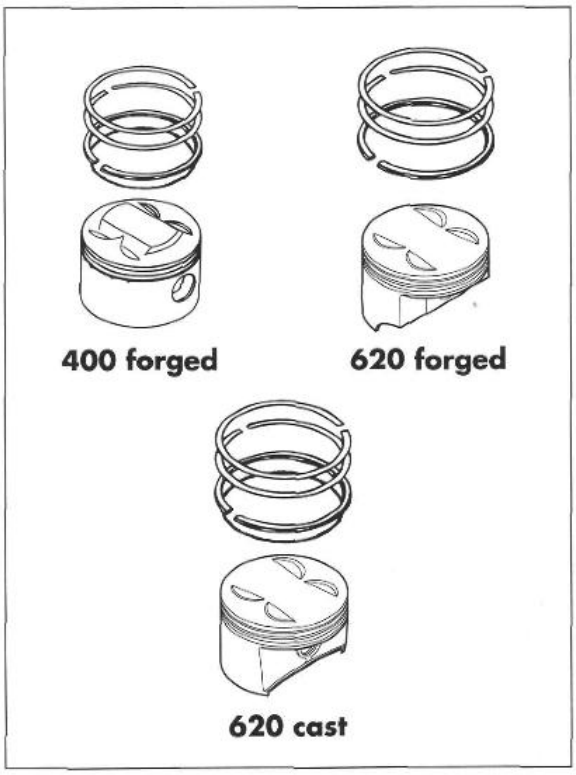


4.4 Piston

- Replace the piston in the case of excessive oil consumption or grooves in the piston skirt.
- If reinstalling the old piston perform the following steps:

1. PISTON BEARING SURFACE - check for damage
2. PISTON RING GROOVES - the piston rings must move easily in the groove. Old piston rings or sandpaper (400 grit) may be used to clean the piston ring grooves.
3. PISTON RINGS - check for damage and end gap (see below).
4. The PISTON PIN must move freely in the piston when mounted. If the piston pin changed its color badly or shows running traces, it must be replaced. Insert piston pin also into the conrod and check for clearance. Maximum clearance in the conrod eye 0.08 mm (0.003 in).

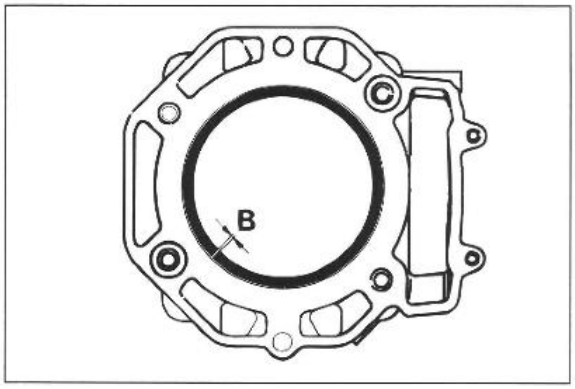
NOTE: WHEN IN PLACE, THE PISTON PIN MAY NOT HAVE ANY PLAY. IT MUST BE POSSIBLE TO SHIFT IT WITH SLIGHT COUNTERPRESSURE.



4.4.1 Mounting instructions for piston rings

- Insert the oil scraper ring in the lower ring groove. Side of ring marked facing piston head.
- Mount compression ring (tapered compression piston ring) in middle ring groove. Side of ring marked facing piston head.
- Insert the compression ring (rectangular ring) in the upper piston ring groove (the surface marked must be on top).

	ELKO Ø 89 mm	ELKO Ø 101 mm	ARIAS Ø 101 mm
Compression ring	O	O	N 100
Tapered piston ring	TOP	TOP	N 101
Oil scraper ring	ELKO	TOP	—

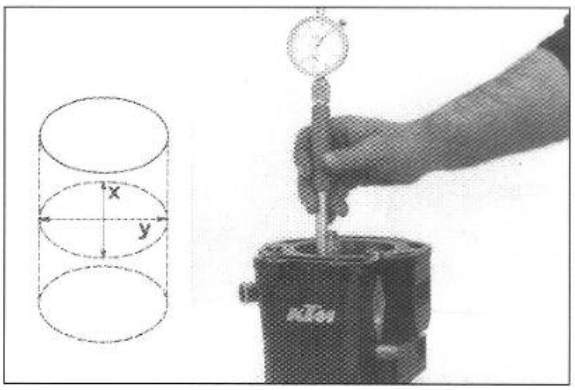


4.4.2 Piston ring end gap

- Insert pisto ring into the cylinder and adjust. Piston ring must be approx. 10 mm (1/2 inch) from top of cylinder.
- The end gap ❽ can now be checked which a feeler gauge.

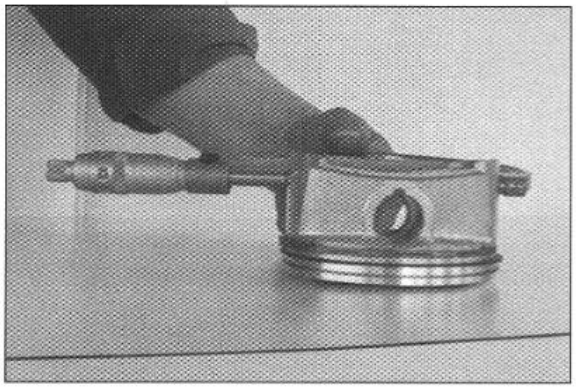
COMPRESSION RINGS: MAX. 0.60 MM (0.023 IN)
OIL SCRAPER RING: MAX. 0.80 MM (0.03 IN)

IF THE END GAP IS GREATER CHECK PISTON AND CYLINDER FOR WEAR. IF PISTON AND CYLINDER WEAR ARE WITHIN THE PERMITTED TOLERANCE LIMITS, REPLACE THE PISTON RING.



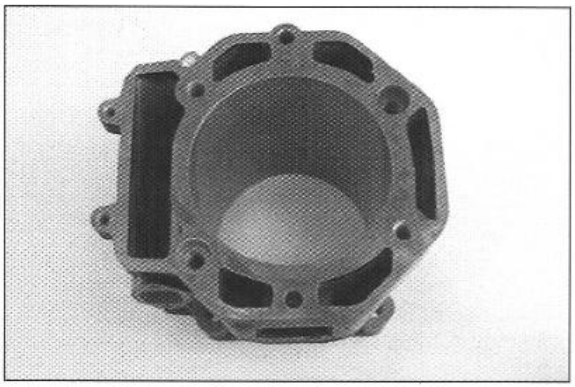
4.5 Measuring piston and cylinder, piston assembly clearance

- In order to determine the wear of the cylinder, measure the cylinder center of the running area with a micrometer.
- Measure the diameter of the x-axis and the y-axis in order to check for oval wear, if any.



- The piston is measured on the piston skirt across to the piston pin as shown in the illustration.
- The cylinder diameter minus the piston diameter yields the piston assembly clearance.

PISTON ASSEMBLY CLEARENCE: MAX. 0.12 MM (0.005 IN)



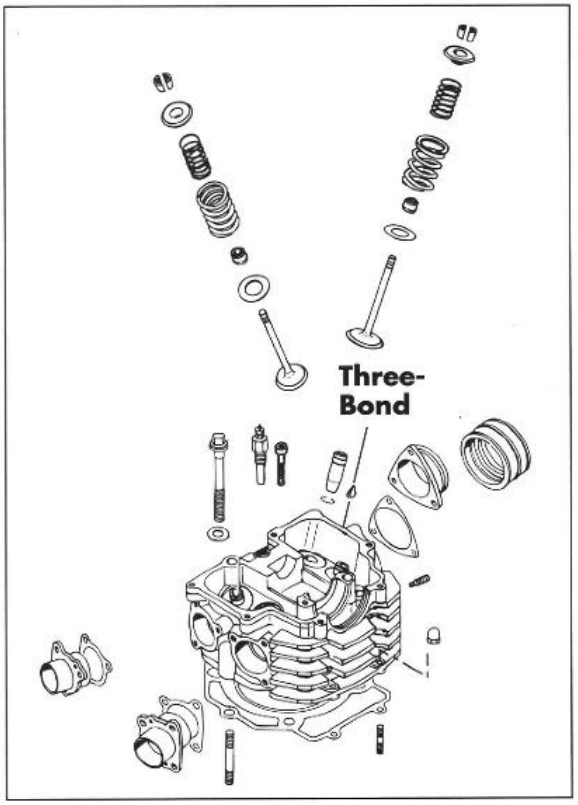
4.6 Cylinder

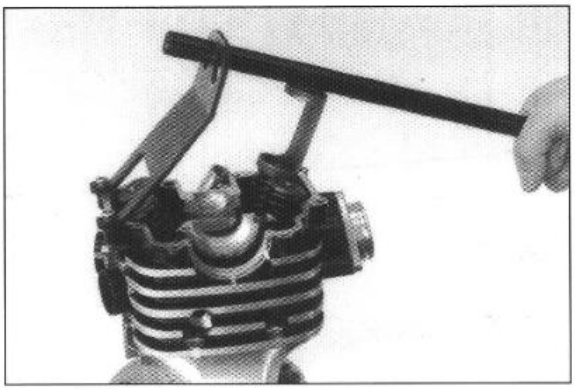
Nikasil is the brand name for a cylinder coating process, developed by the piston manufacturer Mahle. The name is derived from the two materials used in this process - a nickel layer into which the particularly hard silicon carbide is embedded. The main advantages of the Nikasil coating are excellent heat dissipation and thus better power output, low wear and low weight of the cylinder. The worn coating can be regenerated at low cost provided that the running surface of cylinder is flawless.

4.6.1 Recoated cylinder

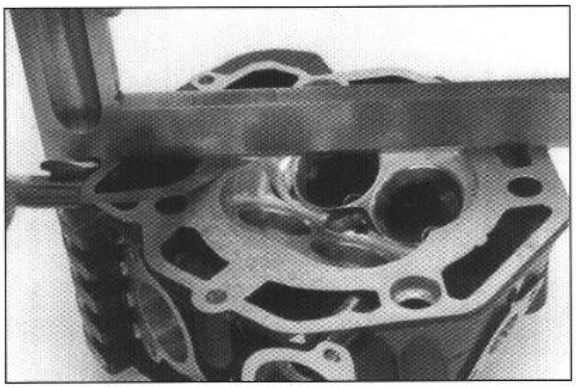
If the Nikasil coating of your cylinder is worn but undamaged, you may obtain a recoated cylinder at your KTM dealer (new Nikasil coating on used cylinder).
It may be that your spare cylinder shows color changes on the exterior side.

4.7 Cylinder head





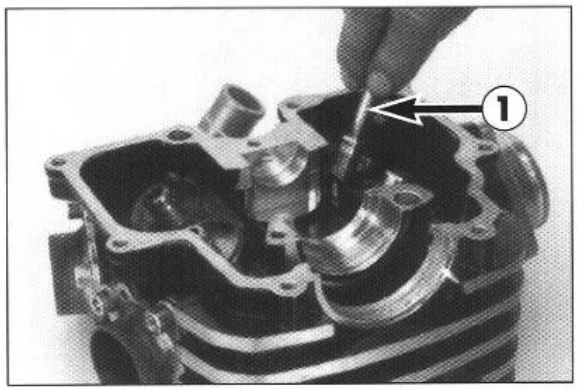
- Mount cylinder head in vice using the studs. Do not allow it to rest on sealing surface.
- Mark valves and remove using special tool (580.12.019.000 and 6.276.470) (see illustration).
- Clean all parts.



SEALING AREA
Check spark plug threads and valve seats for damage or cracks. Check the sealing area to the cylinder for distortions with a straightedge and a feeler gauge. Distortion limit 0.10 mm (0.004 in).

VALVE GUIDES
The valve guides are checked with a limit plug gauge ❶ (580.29.026.007). If the limit plug gauge can be easily inserted into the valve guide, the guide must be replaced in a specialized workshop.

VALVE SEATS
The valve seats must not be pocketed. Seat sealing width: intake max. 1.5 mm (0.059 in); exhaust max. 2.0 mm (0.079 in). Grind valves if necessary.

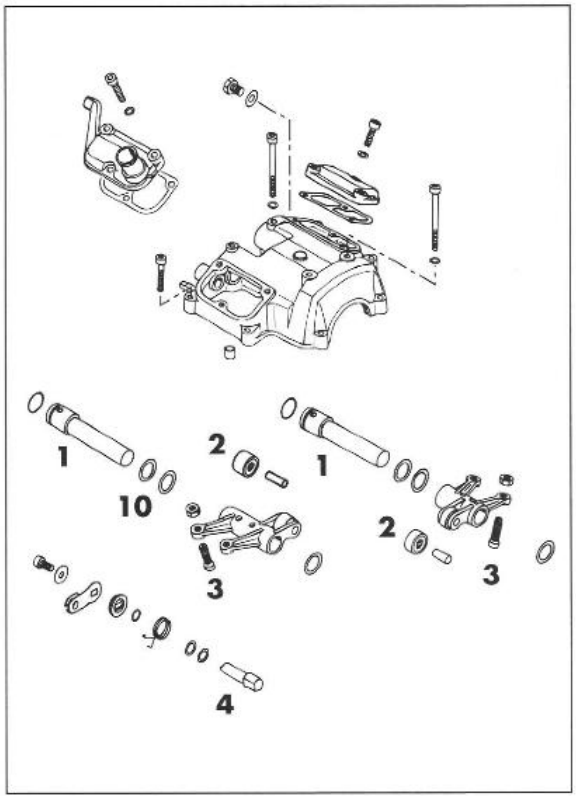


VALVES
Check valve heads for wear and run out. Max. run-out on valve heads 0.03 mm (0.001 in). Valve seats should not be pocketed. The sealing area must be located in the center of the valve seat. The valve stem is hard-chrome plated. Experience shows that wear appears primarily on the valve guide.

VALVE SPRINGS
Only visual check for breakage or wear is necessary.

VALVE STEM SEALS
Always renew valve stem seals when the valves are removed.

INTAKE FLANGE
Check flange surface for distortion, scrape on glas plate if necessary.



4.8 Cylinder head top section

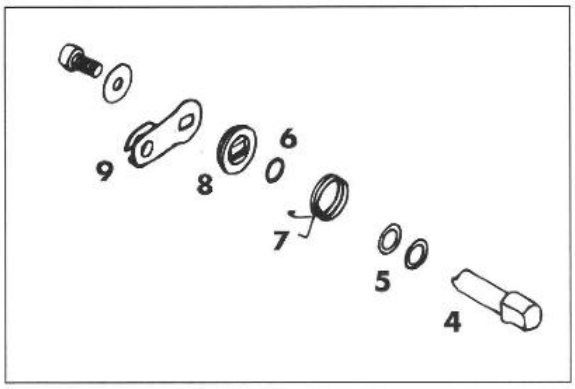
- Remove the rocker arm shafts and take the rocker arms and the washers out of the upper element.
- Remove the decompression shaft and clean all parts.

ROCKER ARM SHAFTS ❶
The rocker arm shafts must be free of grooves and should turn easily within the rocker arms.

ROCKER ARM ROLLERS ❷
The rocker arm rollers must move smoothly. Rocker arm rollers must be removed in the case of radial clearance.

ADJUSTING SCREWS ❸
The contact surfaces of the adjusting screws must be plane.

DECOMPRESSION SHAFT ❹
Check for smooth operation and clearance in the bearing bore.

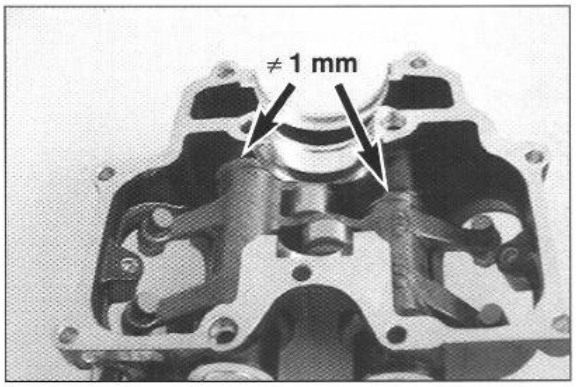


4.8.1 Preassembly of cylinder head top section

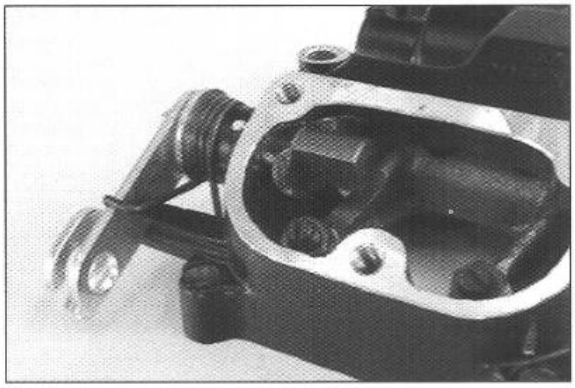
- Insert decompression shaft with compensation washers ❺ into the top section.
- Mount the new O-ring ❻, the decompression lever spring ❼ and the cover disc ❽ in such a way that the O-ring fits into the recess of the cover disc.
- Mount decompression shaft lever ❾ and allan head screw with disc.

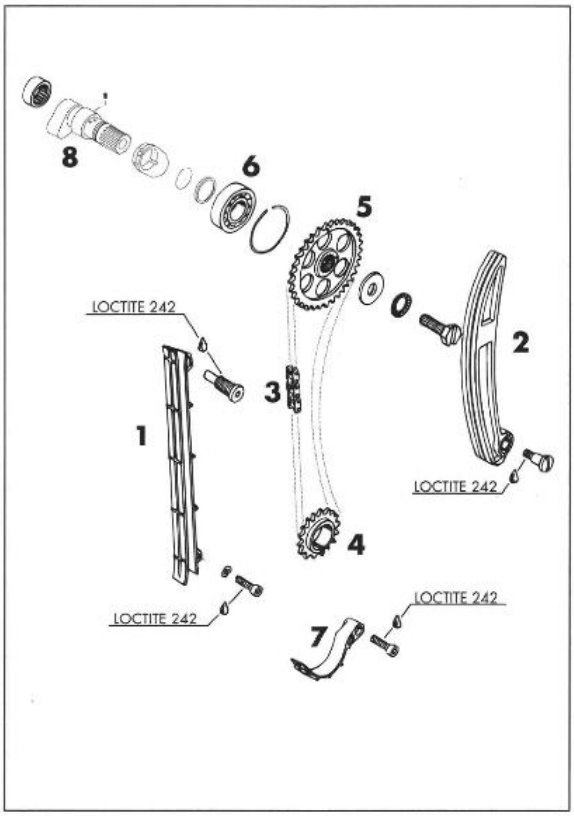
! CAUTION !

THE DECOMPRESSION SHAFT MUST EXHIBIT NO AXIAL PLAY WHEN THE ALLAN HEAD SCREW IS TIGHTENED. TO ENSURE THAT THE O-RING ❻ FORMS A SEAL, IT MUST BE SLIGHTLY PRESSED AGAINST THE TOP SECTION BY THE COVER DISC ❽. HOWEVER, THE PRESSURE ON THE O-RING MUST NOT BE EXCESSIVELY HIGH AS THE DECOMPRESSION SHAFT WILL BECOME SLUGGISH. ASJUST OUT WITH COMPENSATION WASHERS ❺ IF NECESSARY.



- Mount new O-rings on rocker arm shafts.
- Mount rocker arms, thrust washers ❿ and rocker arm shafts.
- On the side of the water pump one thrust washer ≠ 1.0 mm (0.04 in) must be mounted.
- The axial play on the opposite side is roughly equalized with thrust washers ≠ 1.0 (0.04 in) and ≠ 0.5 mm (0.02 in).





4.9 Timing

TIMING CHAIN GUIDE ❶
Check for signs of wear.

TIMING CHAIN TENSIONER ❷
Check for signs of wear.

TIMING CHAIN ❸
Check rollers for smooth operation and signs of wear.

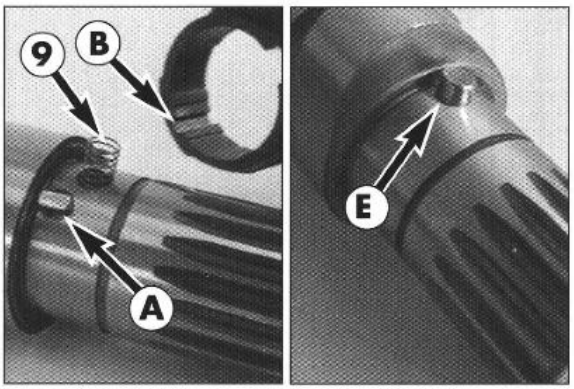
TIMING GEAR ❹
Check teeth for signs of wear.

CAMSHAFT GEAR ❺
Check teeth for signs of wear.

GROOVED BALL BEARING ❻
Check clearance.

SAFETY DEVICE ❼
Check for signs of wear.

CAMSHAFT ❽
Check pivot points and running surfaces for signs of wear.



4.10 Automatic decompression

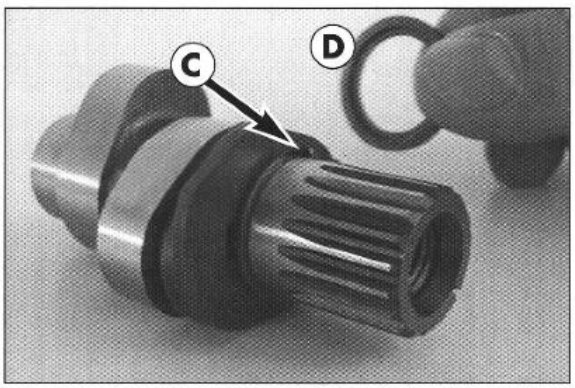
– Remove both the stepped ring and the circlip. Carefully remove the decompression cam. Keep a watch on the spring ❾.

SUPPORTING PIN Ⓐ
Check for signs of wear.

GUIDE PIN Ⓔ
Check for signs of wear.

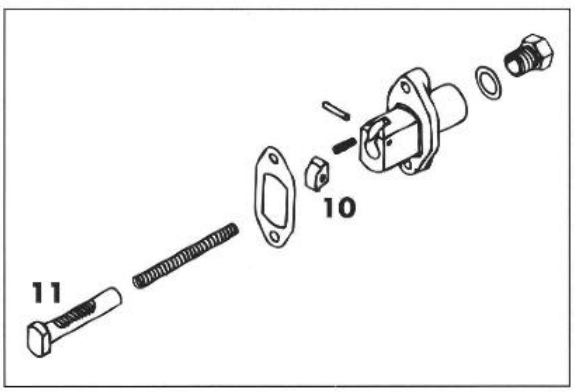
DECOMPRESSION CAM
Check the contact surfaces Ⓑ towards the supporting pin for signs of wear.

SPRING ❾
Check length (minimum length: 7.0 mm/0.275 in).



4.10.1 Preassembly of automatic decompression

– Place spring in the bore, compress and slide decompression cam over it.
– Mount circlip with the sharp side towards the decompression cam.
– Position the open side Ⓒ of the circlip between the open spaces of the decompression cam.
– Slide the step ring Ⓓ with open spaces over the lock washer.

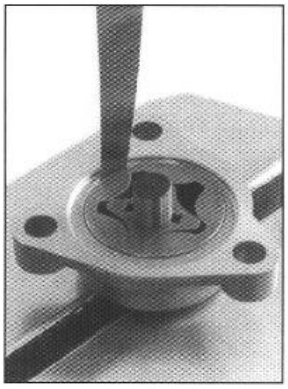


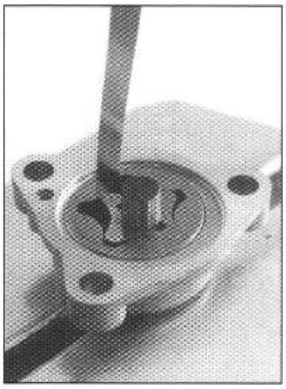
4.11 Automatic tensioner

– Check ratcheting pawl ❿ for smooth operation and wear.
– Check thrust bolt ⓫ for wear at teeth.

4.11.1 Preassembly of automatic tensioner

– Insert thrust bolt into tensioner housing and engage ratcheting pawl into first notch.





4.12 Oil pumps

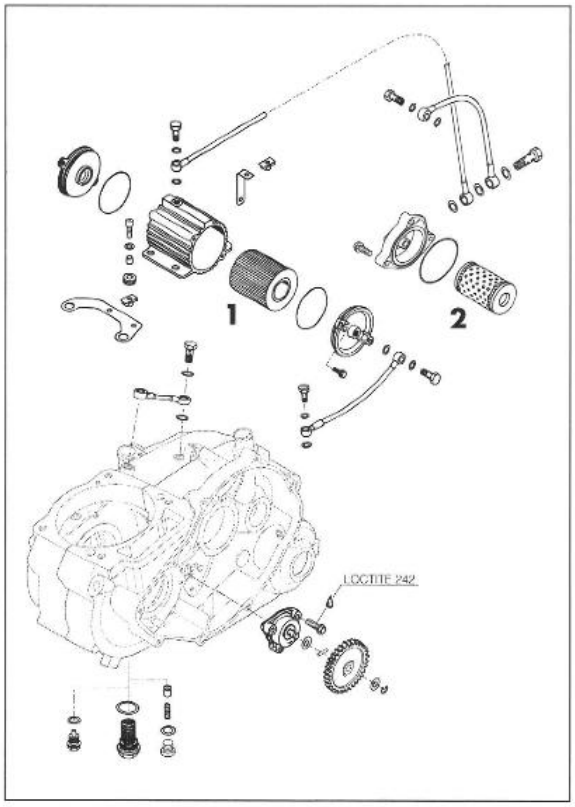
NOTE: THE TWO OIL PUMPS ARE SIMILAR IN DESIGN BUT WORK AT DIFFERENT SPEEDS. DISASSEMBLE AND CHECK THE OIL PUMPS SEPARATELY TO AVOID MIXING UP OF COMPONENTS.

- Remove oval head screws, remove cover and clean all parts.
- Place rotor into the oil pump housing with the point facing inward.
- Mount oil pump shaft and bearing needle and check oil pump for wear with a feeler gauge.

CLEARANCE OUTER ROTOR - HOUSING: MAX. 0.20 MM (0.008 IN)
LIMIT CLEARANCE OUTER ROTOR - INNER ROTOR: MAX. 0.20 MM (0.008 IN)

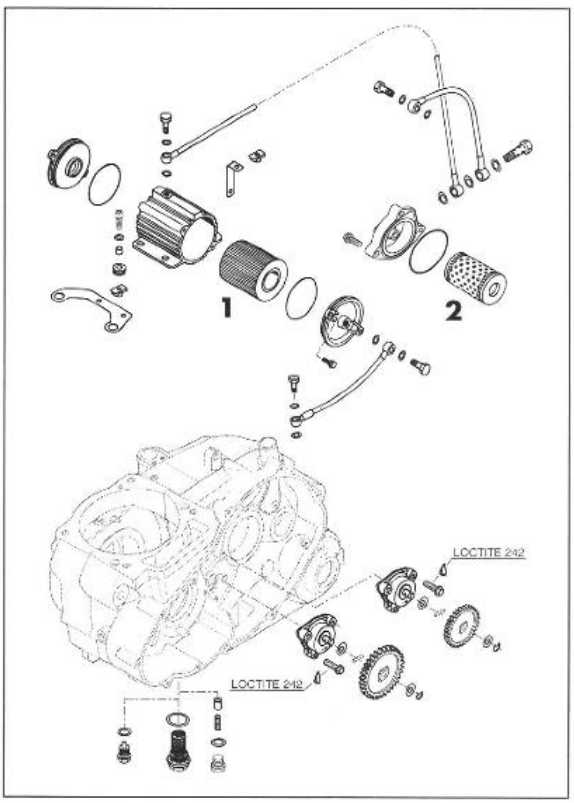
! CAUTION !

FILL OIL PUMPS WITH OIL BEFORE PREASSEMBLING.



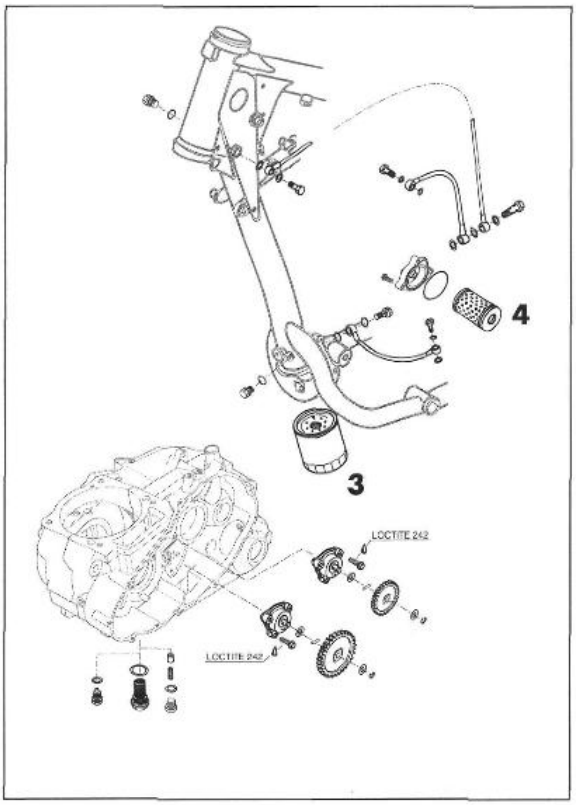
4.13 Oil lines (SX)

- Check oil lines and banjo bolts for damage and clear passage.
- When repairing the engine, the microfilter ❶ and the oil filter ❷ must be replaced.



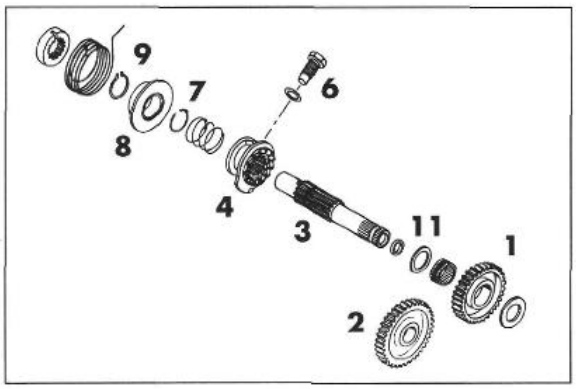
4.13.1 Oil lines (SC)

- Check oil lines and banjo bolts for damage and clear passage.
- When repairing the engine, the microfilter ❶ and the oil filter ❷ must be replaced.



4.13.2 Oil lines (EGS, DUKE e))

- Check oil lines and banjo bolts for damage and clear passage.
- When repairing the engine, the fine filter ❸ and the oil filter ❹ must be replaced.



4.14 Kickstarter

STARTER GEAR ❶
Check the bearing for clearance (the starter gear must be in permanent mesh with the outer clutch hub).

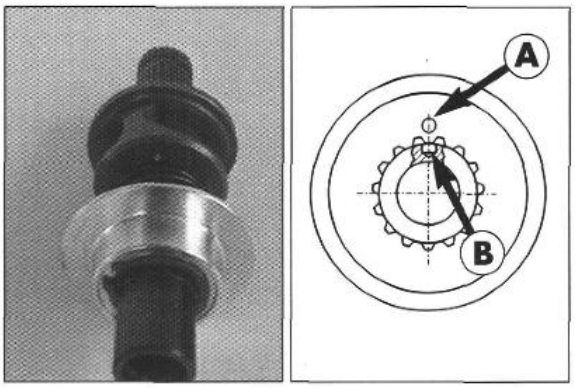
INTERMEDIATE STARTER GEAR ❷
Check the bearing for clearance.

KICK STARTER SHAFT ❸
Check the toothing for signs of wear.

RATCHET GEAR ❹
Check the ascending surface and the toothing for signs of wear.

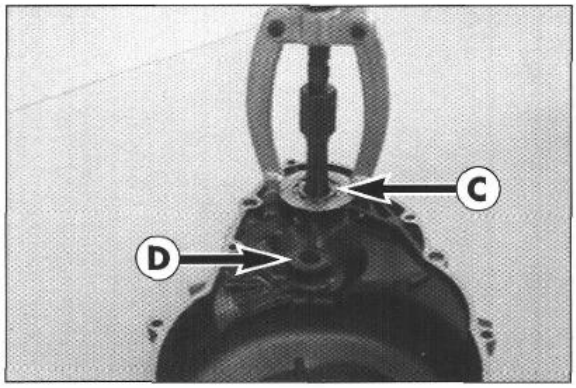
STOP SCREW ❻
Check for signs of wear.

Replace the SEAL RING ⓫



4.14.1 Preassembly of kickstarter shaft

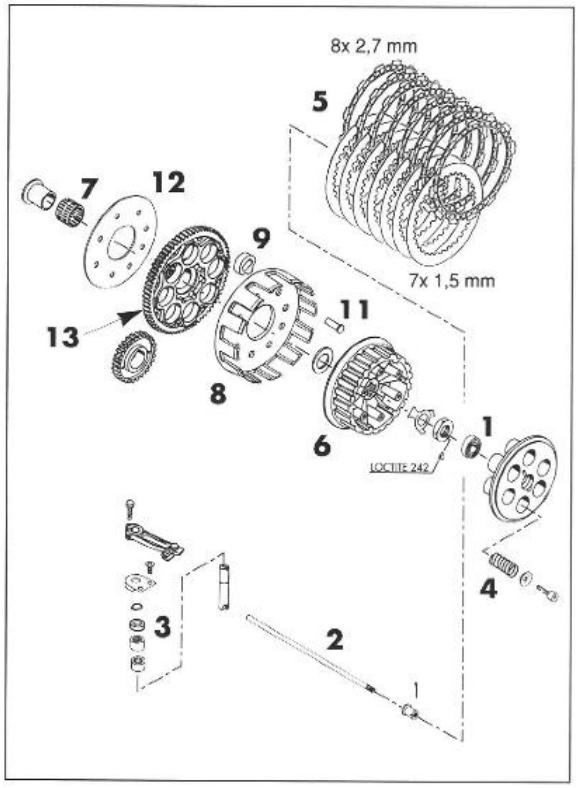
- Clamp kickstarter shaft with toothed end in vice (use soft jaw-covers).
- Mount circlip ❼ in lower ring groove.
- Fit spring guide ❽ with collar facing downwards and circlip ❾ with sharp edge facing upwards.
- Remove kickstarter shaft from vice and fit ratchet gear spring.
- Mount the ratchet gear on the kickstarter shaft in such a way that the markings Ⓐ and Ⓑ coincide.



4.15 Clutch cover

BALANCER SHAFT BEARING Ⓒ
Use the bearing extractor tool (151.12.017.000) with insert (151.12.018.100) to remove the grooved ball bearing from the bearing seat.
Insert the new bearing into the seat and ensure flush fit.

CRANKSHAFT SEAL RING Ⓓ
Insert the new shaft seal ring and ensure flush fit.



4.16 Clutch

THRUST BEARING ❶
Check for signs of wear.

PUSH ROD ❷
Check the face side for signs of wear.

CLUTCH RELEASE SHAFT, SEALING CUP, BOOT AND NEEDLE BEARING ❸
Check for damage and signs of wear.

CLUTCH PRESSURE SPRINGS ❹
Minimum length: 34.5 mm (1.36 in) (length/new spring: 37 mm (1.457 in)).
Replace all 6 springs if necessary.

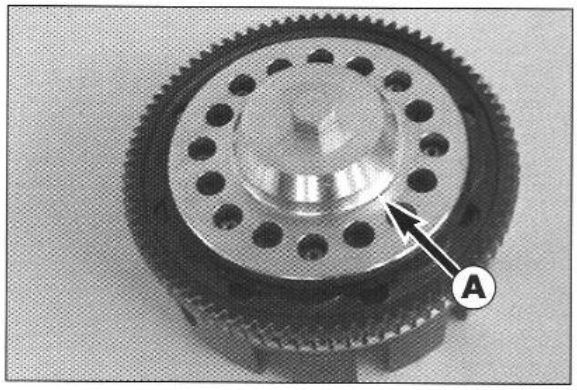
CLUTCH DISCS ❺
Clutch discs must be plane.
7 steel discs 1.7 mm (0.066 in) (must be free of grooves.
8 lining discs 2.7 mm (0.106 in), wear limit: 2.5 mm (0.1 in)

INNER CLUTCH HUB ❻
Check both the exterior and the interior toothing for signs of wear.

NEEDLE BEARING OF THE OUTER CLUTCH HUB ❼
Check for signs of wear.

OUTER CLUTCH HUB ❽
Check if all rivets are tight.

ABSORBING ELEMENTS ❾
Power transmission from the primary drive to the clutch is cushioned by rubber elements ❾. These rubber elements must be checked in the course of normal checking for signs of wear. It is recommended to check the elements while disassembling the engine. Try to turn the outer clutch hub after removing the inner clutch hub (engine will lock). Dead travel should be impossible.



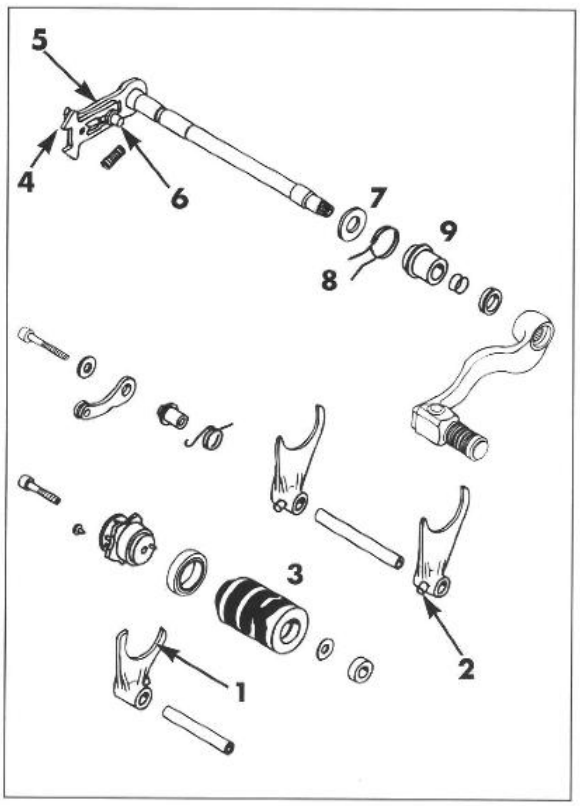
4.16.1 Replacing absorbing elements of the outer clutch hub

– Drill open the clutch rivets ⓫ in area of the retaining bracket ⓬ and take off the parts.

NOTE: ALWAYS REPLACE ALL EIGHT DAMPING ELEMENTS.

! CAUTION !

THE DAMPING ELEMENTS ARE WIDER THAN THE PRIMARY GEAR CROWN ⓭. TO ENSURE THAT THE OUTER CLUTCH HUB ❽ AND RETAINING BRACKET ARE POSITIONED DIRECTLY ON THE PRIMARY GEAR CROWN, THE PARTS MUST BE HELD IN POSITION UNDER TENSION WITH THE CLUTCH RIVETTING TOOL Ⓐ (546.29.027.000) BEFORE RIVETTING.



4.17 Shift mechanism

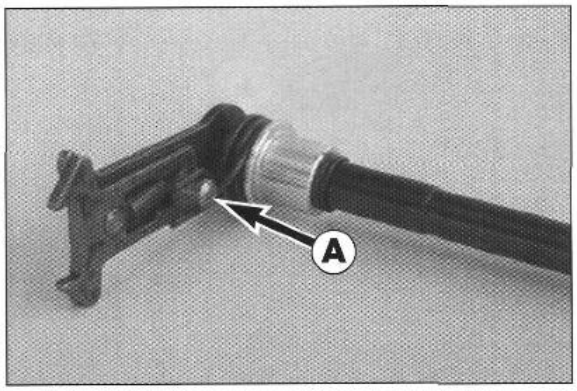
SHIFT FORKS ❶
Check the fork leaf for signs of wear.
Check the shift roller driving pin ❷ for signs of wear.

SHIFT ROLLER ❸
Check the shift grooves for signs of wear.
Check the bearing for clearance.

SLIDE PLATE ❹
Check the contact surfaces for signs of wear.
Check the return surface of the slide plate for signs of wear (replace in the case of deep grooves).

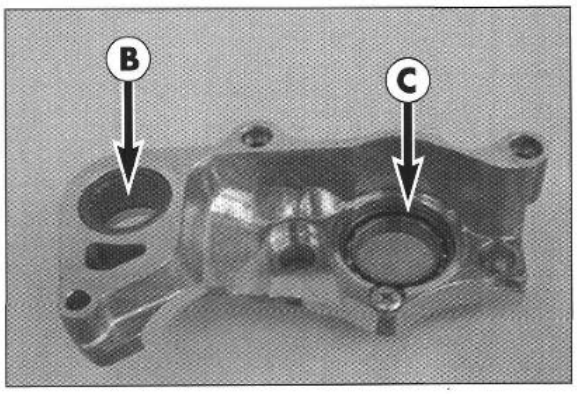
SLIDE GUIDES ❺
Check clearance (maximum clearance between guide bolt and slider 0.7 mm / 0.027 in.).

GUIDE BOLT ❻
Check for tight fit and signs of wear.



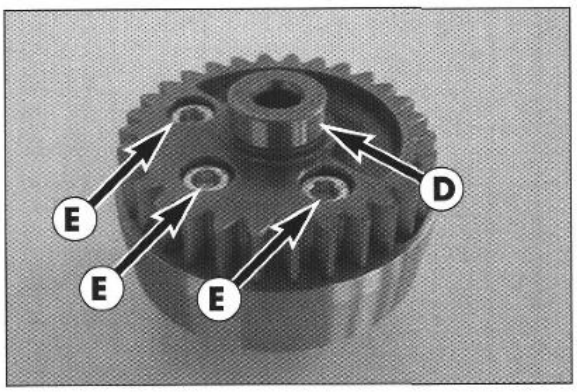
4.17.1 Preassembly of shift shaft

- Push 14x28x2 steel disc ❼ onto shift shaft.
- Mount return spring ❽ so that offset Ⓐ faces shift quadrant.
- Mount spring sleeve ❾ with shallower collar facing shift quadrant.
- Cross return spring legs and hook in shift quadrant.
- Mount O-rings.



4.17.2 Shift mechanism support

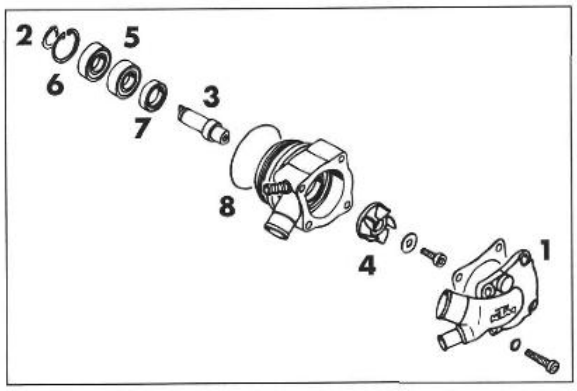
- If it is necessary to exchange the grooved ball bearing Ⓒ, make sure that new grooved ball bearing is pressed in so that it is flush.
- Apply Loctite 242 to the screw and fix the bearing.
- Also the new needle bearing of the kickstarter shaft Ⓑ has to be pressed in flush.



4.18 Balancer shaft

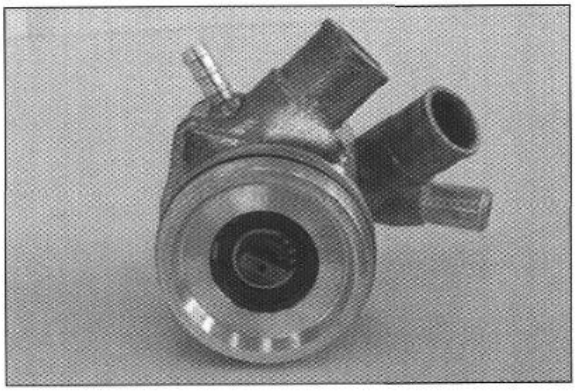
Check BEARING SEAT ❿ for wear and tear.

Check three ALLAN HEAD SCREWS ❿ for tight fit.



4.19 Water pump

- Remove water pump cover ❶.
- Remove circlip ❷ from the water pump shaft ❸ and pull shaft and water pump wheel ❹ out of the grooved ball bearings.
- If grooved ball bearings ❺ are replaced remove circlip ❻ and shaft seal ring ❼ and press out bearing.
- Properly lubricate new grooved ball bearings and press in to stop with the open sides facing each to them.
- Mount circlip ❻
- Cover new shaft seal ring with Loctite 648 and press in with the printing facing upward.
- Lubricate water pump shaft and mount carefully so as to not damage sealing lips of shaft seal ring and check for smooth working.
- Mount circlip ❷ and water pump cover with gasket.
- Finally, remove silicone from the sealing flange and mount new O-ring ❽.



4.20 Transmission

- Fix the main shaft or countershaft, respectively, in the vise (use special vise jaws to avoid damaging of the shafts) and remove the gear wheels.
- Clean and check all parts.

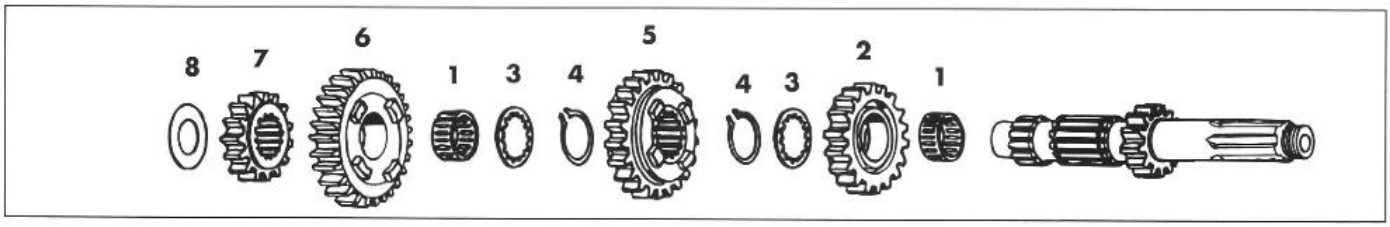
Check the TOOTH PROFILES of transmission shafts and sliding gears for signs of wear.

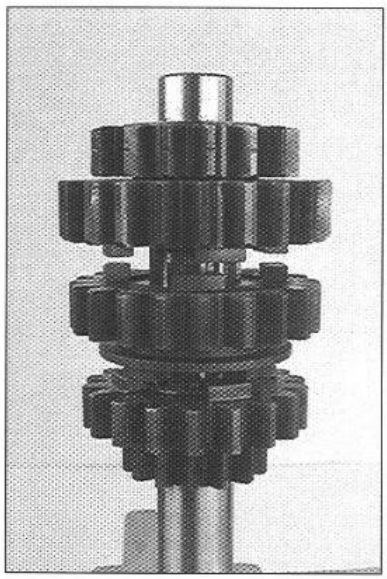
Slide the SLIDING GEARS onto the transmission shafts and check the toothing for easy operation.

Check the PIVOT POINTS of the transmission shafts.

Mount the IDLER GEARS with the bearings on the transmission shafts and check for clearance.

Check the NEEDLE BEARINGS of the idler gears.

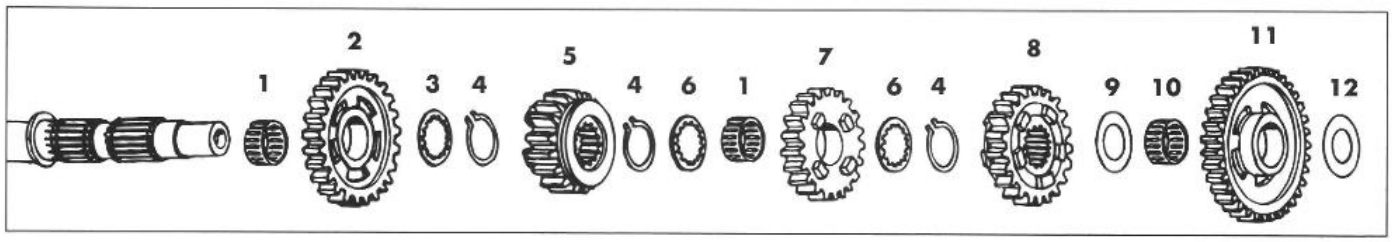


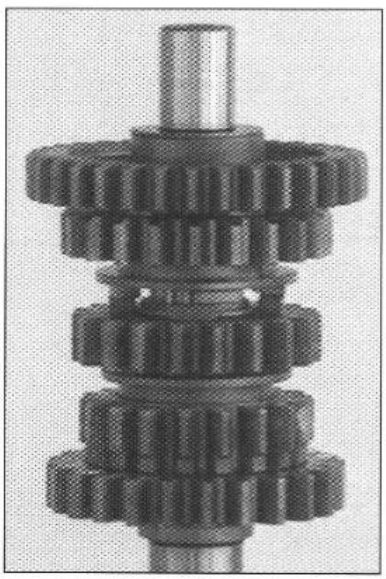


4.20.1 Assembly of main shaft

- Mount the main shaft in a vise with the gearwheel facing downwards (use protective jaws).
- Mount the needle cage ❶ and slide the 3rd gear ❷ with the shift dogs facing upwards.
- Mount stop disc ❸ and the circlip ❹ with the sharp edge facing up.
- Mount 4th gear ❺ with the shift groove facing down.
- Secure it with the circlip with the sharp edge down and mount the stop disc ❸.
- Mount needle cage ❶ and 5th gear ❻ with the shift dogs down.
- Mount 2nd gear ❼ and 1 mm stop disc ❽.

NOTE: CHECK ALL GEARS FOR SMOOTH OPERATION.

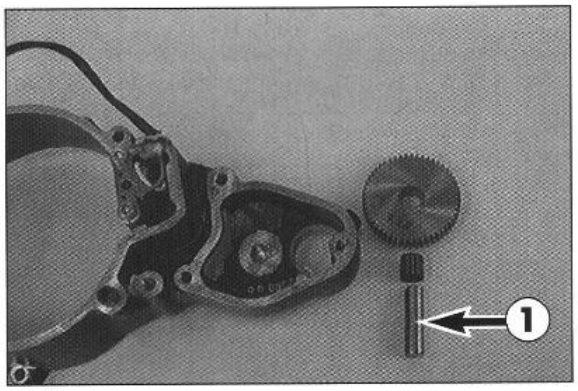




4.20.2 Assembly of counter shaft

- Mount counter shaft in vise with collar facing downwards.
- Oil and mount needle cage ❶.
- Slide 2nd gear ❷ over needle cage with collar facing downwards.
- Mount stop disc ❸ with clearance towards gear wheel and circlip ❹ with sharp edge facing upwards.
- Mount 5th gear ❺ with shift groove facing upwards.
- Fit circlip ❹ with sharp edge down and stop disc ❻.
- Mount needle cage ❶ and fit 4th gear ❼ with shift dogs facing up.
- Mount stop disc ❻ and circlip ❹ with sharp edge facing up.
- Fit 3rd gear ❽ with shift groove down and mount stop disc ≠ 1.5 mm ❾.
- Mount needle cage ❿, 1st gear ⓫ with collar facing up and fit stop disc ≠ 1 mm ⓬.

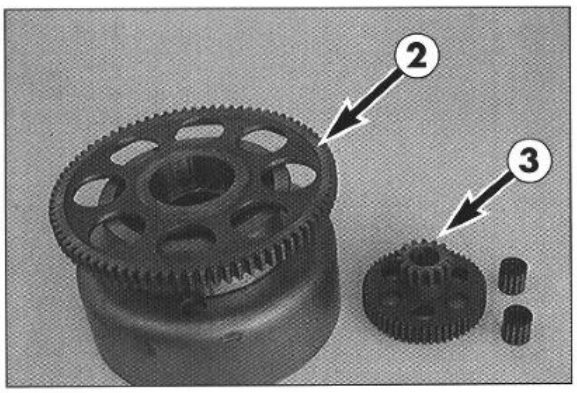
NOTE: CHECK ALL GEARS FOR SMOOTH OPERATION.



4.21 Intermediate gear

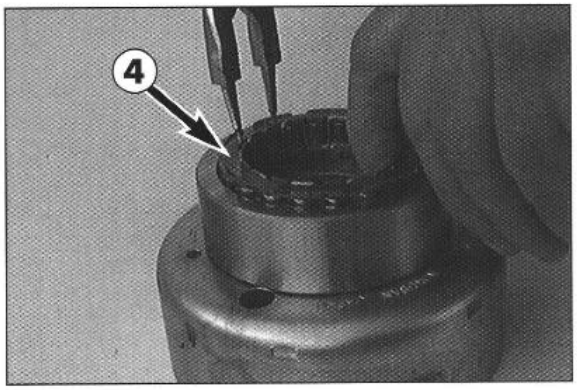
- Remove the starter cover.
- Pull out the bearing bolt ❶.
- Remove the intermediate gear and the needle bearing.
- Check the parts for signs of wear.

- Insert the intermediate gear with the collar downward into the housing for preassembly.
- Oil the needle bearing and install it with the bearing bolt.
- Do not yet replace the starter cover.



4.22 Check the freewheel

- Insert the freewheel gear ❷ into the freewheel.
- The freewheel gear must turn clockwise.
- The freewheel gear must lock without empty run if turned anticlockwise.
- Check the reduction gear ❸ and the needle bearings for signs of wear.
- Check the needle bearing of the freewheel gear for signs of wear.



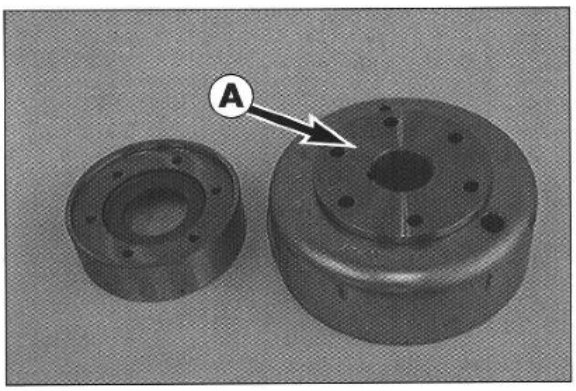
4.23 Replace the freewheel hub

- Squeeze the spreader ring ❹ with the circlip pliers and remove it together with the freewheel.
- Check the freewheel segments for signs of wear.
- Check the freewheel hub sections at the freewheel running surface for signs of wear.
- Heat the flywheel to a temperature of approx. 80° C (176° F) and remove the 6 screws.

! CAUTION !

MAKE SURE THAT THE FLYWHEEL IS NOT HEATED BEYOND 80° C (176° F) TO AVOID LOOSENING OF THE MAGNETS.

- Strike the lateral sections with a plastic hammer to remove the freewheel hub.

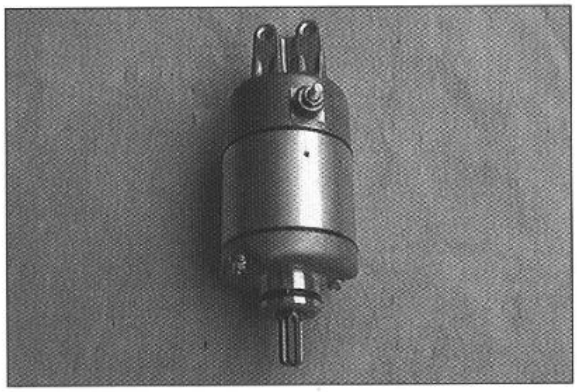


- Apply Loctite 648 to the flange surface of the flywheel and the freewheel hub Ⓐ.
- Mount the freewheel hub on the flywheel.
- Apply Loctite 648 to new screws and tighten the screws with 18 Nm (13 ft.lb.).

! CAUTION !

ALWAYS USE NEW SCREWS (12.9) AND APPLY LOCTITE 648 TO THE THREADS.

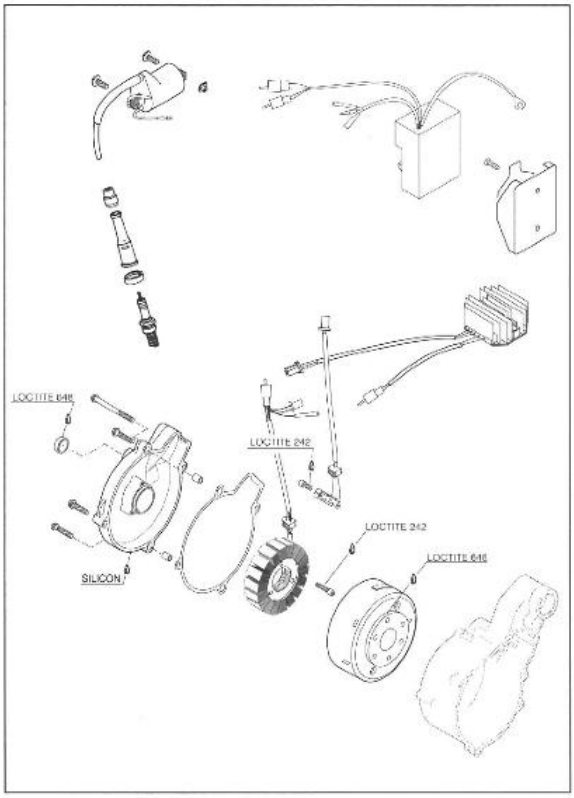
- Oil the freewheel and insert it into the freewheel hub.



4.24 E-starter motor

- The starter showed only slight signs of wear after 10.000 starting processes, and exchanging individual parts must be considered uneconomical. Therefore, such work is not described in the present documentation.

- Replace O-ring at the starter flange (part of the gasket kit).



4.25 Ignition (Kokusan)

General information

The measurements described below will only reveal severe problems. Coil short circuits leading to weak ignition sparks or low generator output, respectively, can only be detected with the help of an ignition test bench. In the case of malfunction always check the cables and the plug and socket connections of the ignition system first.
Make sure to select the correct measuring range when performing measurements.

4.25.1 Spark plug (NGK DR 8 EA)

SPARK PLUG RESISTOR
Use an ohmmeter to measure the resistance between the electrode and the ignition wire connection.

SETPOINT VALUE: 3.0 - 7.5 kΩ

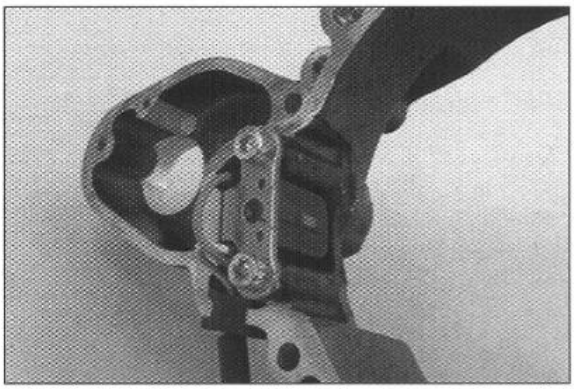
Replace the spark plug if the measured value deviates significantly from the setpoint value.

ELECTRODE DISTANCE: 0.70 MM (0.0027 IN)

INSULATOR
Check for cracks and fissures.

! CAUTION !

ALWAYS USE A SPARK PLUG WITH RESISTOR. OTHERWISE PROBLEMS CAN OCCUR IN THE CDI UNIT.

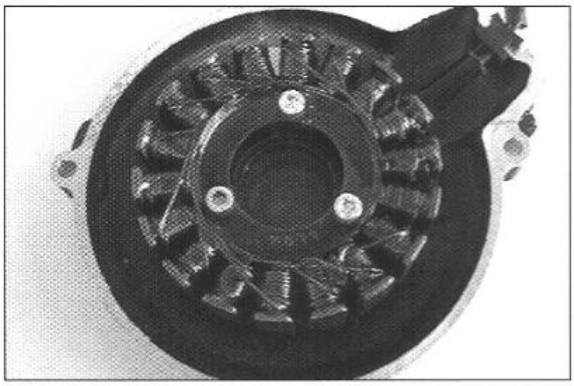


4.25.2 Check stator and pulse generator (Kokusan)

Use an ohmmeter to perform the following measurements:
NOTE: THE MEASURING MUST BE PERFORMED AT A TEMPERATURE OF 20° C. OTHERWISE SIGNIFICANT DEVIATIONS MUST BE EXPECTED.

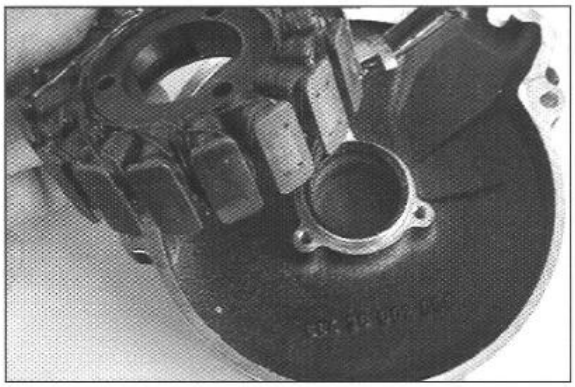
MEASUREMENT	CABLE COLORS	RESISTANCE
Stator	red/black – black/red yellow – black/red yellow – red/black	0.45 – 0.56 Ω
Pulse generator	white – green	80 – 120 Ω

Replace the stator and/or the pulse generator if the measured values deviate significantly from the setpoint values or in the case of continuity between one of the cables and ground.

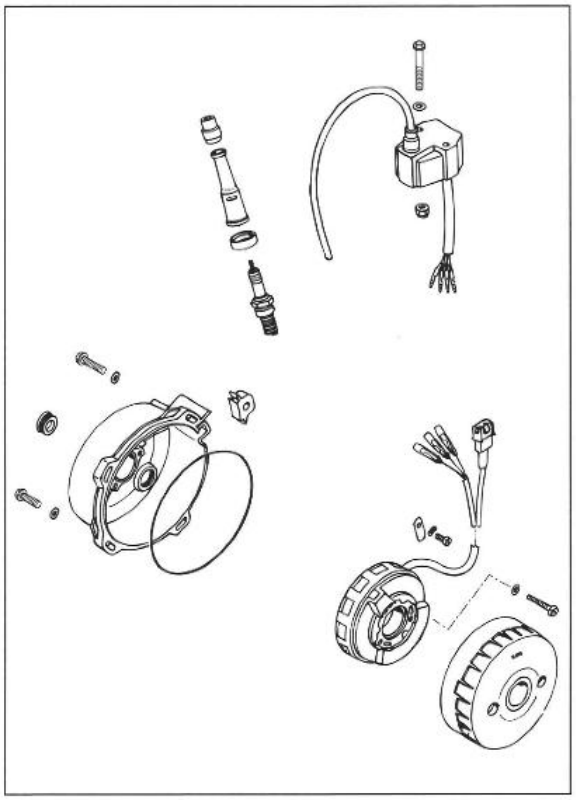


4.25.3 Replace stator (Kokusan)

- Loosen the 3 screws and remove the stator.



- Insert a new stator into the ignition cover.
- Apply Loctite 242 to 3 new screws and tighten the screws.
- Insert the cable guide in the opening provided for that purpose in the ignition cover.



4.26 Ignition (SEM)

General information

The measurements described below will only reveal severe problems. Coil short circuits leading to weak ignition sparks or low generator output, respectively, can only be detected with the help of an ignition test bench. In the case of malfunction always check the cables and the plug and socket connections of the ignition system first.

Make sure to select the correct measuring range when performing measurements.

4.26.1 Spark plug (NGK D 8 EA)

– Set the electrode distance.

ELECTRODE DISTANCE: 0.60 MM (0.0024 IN)

INSULATOR

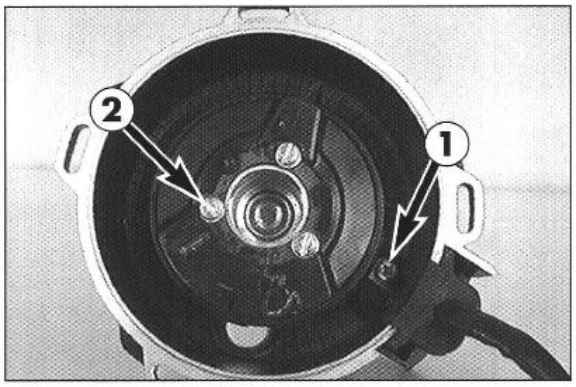
Check for cracks and fissures.

+ POLE	– POLE	MEASURE VALUE
black	red	1.7 kΩ
red	black	1.7 kΩ
black	green	165 Ω +/- 20 Ω
green	green	165 Ω +/- 20 Ω
green	red	1.7 kΩ
yellow	yellow	1.0 Ω

4.26.2 Check stator (SEM)

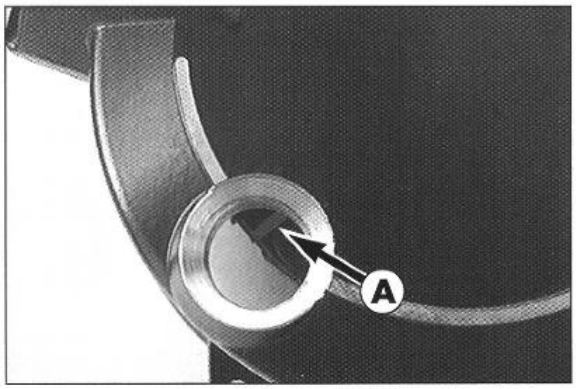
Perform the measurements indicated to the left with an ohmmeter.

NOTE: THE MEASURING MUST BE PERFORMED AT A TEMPERATURE OF 20° C. OTHERWISE SIGNIFICANT DEVIATIONS MUST BE EXPECTED.



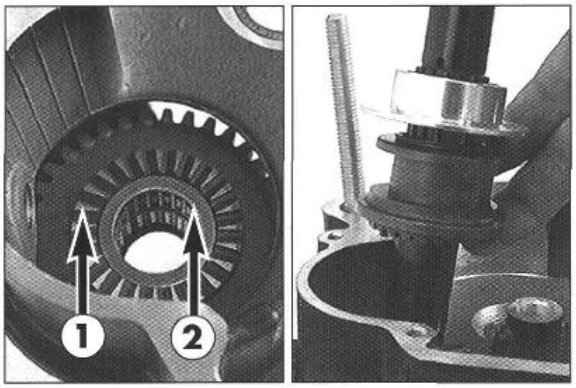
4.26.3 Replace stator (SEM)

– Remove screw ❶ with retaining bracket.
– Remove the three clamp screws ❷ and lift the stator out of the ignition cover.



– Mount the new stator in such a way that the timing mark Ⓐ is visible in the checking hole on the rear side.
– Mount clamp screws but do not tighten yet.
– Turn the stator clockwise onto the stop position. Fix the cable strand with retaining clips and insert the rubber cable guide into the opening provided for that purpose.
– Tighten the clamp screws.

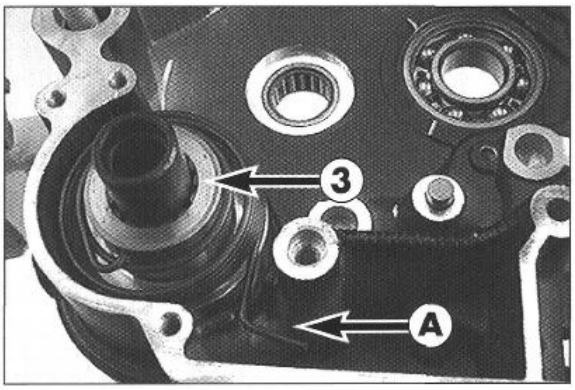
5.0 Engine assembly



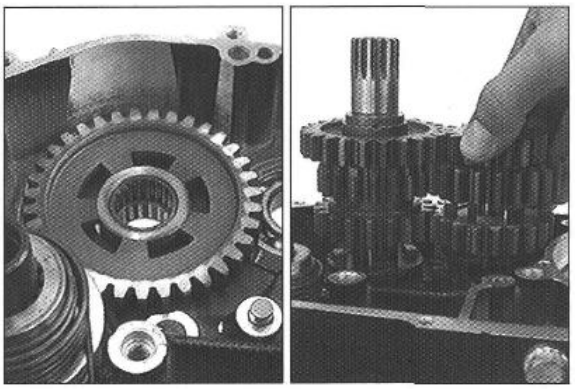
– Place left-hand housing half in engine work stand.

5.1 Kickstarter

– Insert (22.2x35x2 mm) stop disc, starter gear ❶, needle bearing and (22x30x1.5 mm) stop disc ❷ into housing.
– Insert preassembled kickstarter shaft through starter gear into bearing seat.

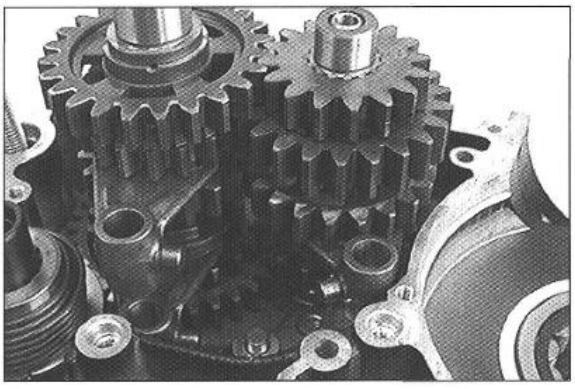


– Fit starter spring onto spring guide and hook the outer end into the housing recess Ⓐ.
– Hook the inner end of the starter spring in the kickstarter shaft hole.
– Fit driving hub ❸ with clearance space over the end of the spring.



5.2 Transmission, shift mechanism

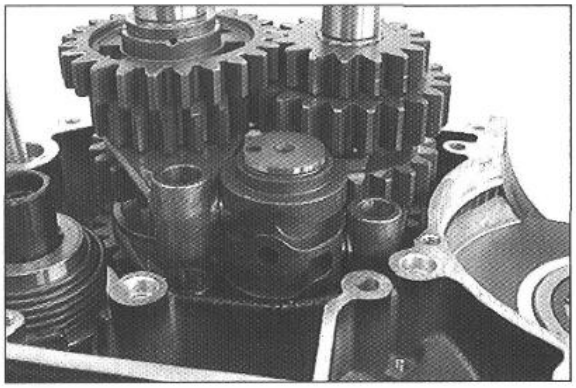
– Insert stop disc, 1st gear wheel with collar facing down into the housing and the needle bearing into the idler gear.
– Mount transmission shafts together and slightly turn them.



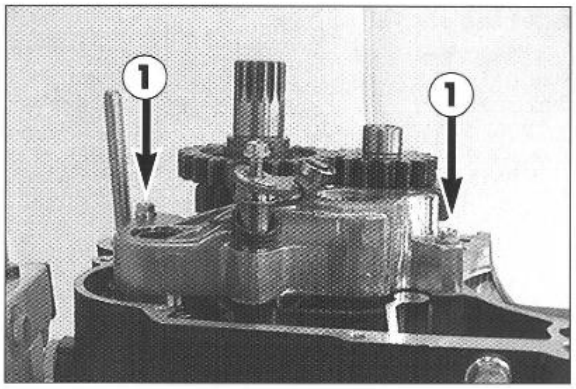
– Hook shift fork with legs of same length in the sliding gear of the main shaft.
– Fit the other two shift forks into the gears of the counter shaft, paying attention to the marks applied during disassembly.

! CAUTION !

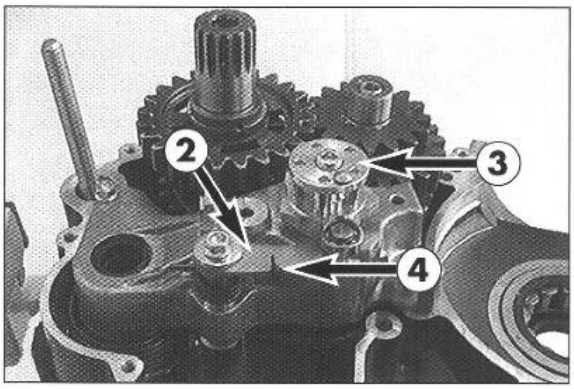
USED SHIFT FORKS SHOULD BE MOUNTED IN THE SAME SLIDING GEAR AS BEFORE.



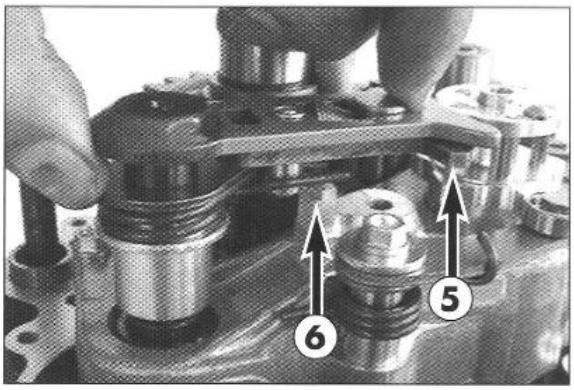
– Insert shift roller into the housing with the holder for the locking piece facing up.
– Hook the shift forks into the shift roller and mount shift rails. The shorter shift rail must be fitted to the main shaft.



- Before mounting the shift mechanism support, check whether the two dowels have been fitted.
- Mount shift mechanism support, secure the two screws ❶ with Loctite 242 and tighten.
- Slide onto the third screw the locking lever, spring sleeve, locking lever spring and disc ≠ 1 mm (0.004 in), apply Loctite 242 to threads and tighten.

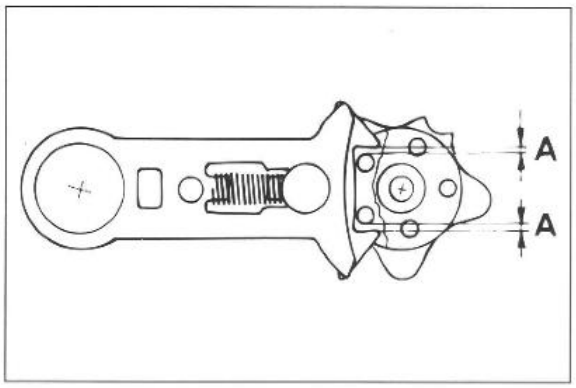


- Pull locking lever ❷ away from the shift roller.
- Fit locking piece ❸ onto shift drum and fasten with the allan head screw.
- Finally, fit the locking lever spring ❹.

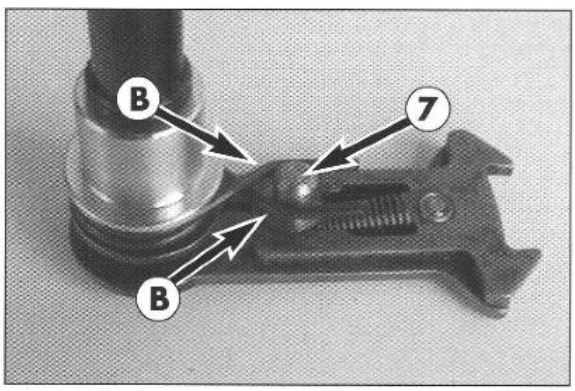


- Coat O-rings of gear-change lever shaft with oil and slide preassembled shift shaft into kickstarter shaft.
- At the same time, push back the slide plate ❺ and make sure that the ends of the return spring are resting against the centering cup of the shift mechanism support ❻.

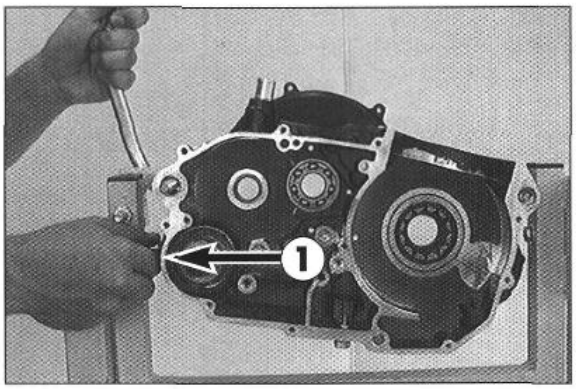
5.3 Adjustment of return spring



- Engage second or third gear.
- Check free travel of slide plate and check shift pin play.
- The free travel of the slide plate is the path this component travels until the shift roller is moved. The return spring pressure will be felt. Proceeding from the basic position, this free travel Ⓐ should be identical for upward and downward movement.
- If necessary, the free travel must be readjusted by adjusting the return spring.



- For this purpose, remove the shift shaft and bend the return spring by an appropriate amount at points Ⓑ using a pair of pliers. Refit shift shaft. After the shift shaft has been fitted, the return spring must rest against shift pin ❼ and against the centering cup on the shift mechanism support.
- If necessary, bend the return spring accordingly.



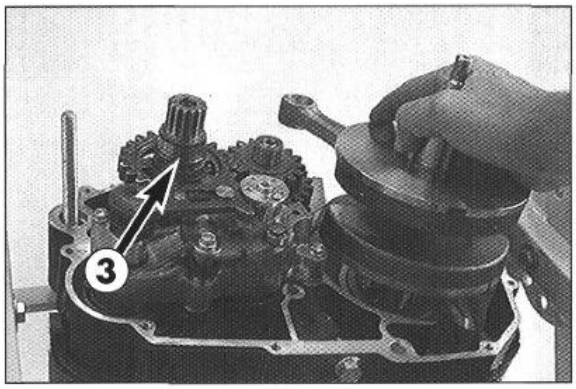
5.4 Pretensioning of the starter spring

- Fit kickstarter onto kickstarter shaft, turn one revolution in starting direction and hold in this position.
- Mount stop screw ❶ with seal ring.

! CAUTION !

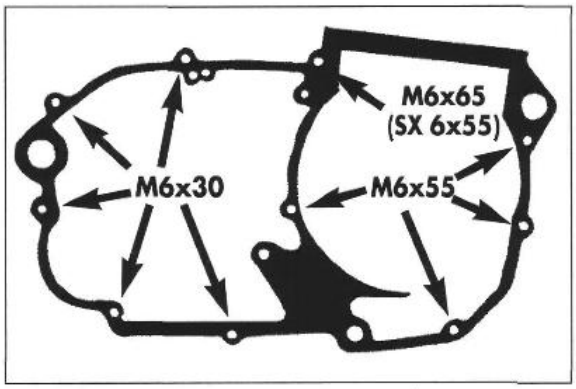
IT MUST NOW BE EASILY POSSIBLE TO SCREW HOME THE STOP SCREW BY HAND. DO NOT APPLY FORCE.

- Move kickstarter to stop and remove.
- Tighten stop screw with 50 Nm (37 ft.lb).



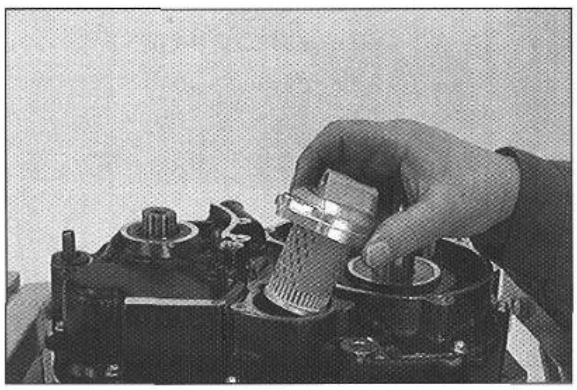
5.5 Mounting crankshaft

- Grease crankshaft seal ring
- Fit mounting sleeve (580.12.005.025) onto crankshaft and place crankshaft into bearing.
- Place O-ring (22x1) and inner ring ❸ of roller bearing on the counter shaft with the collar facing the gear.



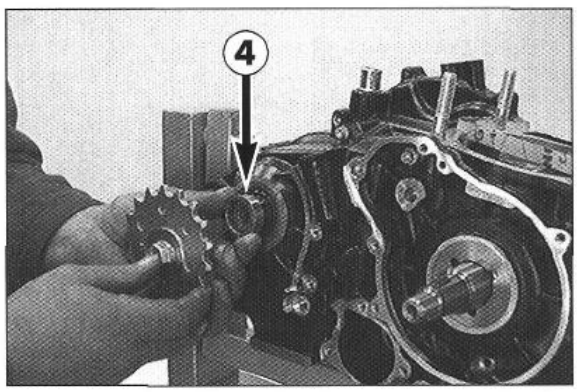
5.6 Assembly of engine housing

- Make sure both dowels are in place in the left housing half, and put gasket on the sealing surface. Use a little bit of grease to hold the gasket in place.
- Grease the shaft seal rings of the right housing half and put on housing half. If necessary, tap lightly with a plastic mallet and turn transmission shafts.
- Check to make sure that the gasket is in the proper position before final assembly.
- Grease housing screws (threads and contact surfaces of screw heads). Insert screws and assemble the housing (see sketch for screw lengths).
- Check all the shafts for easy running before and after tightening with 7-8 Nm (6 ft.lb).
- Mount case in mounting rack and check function of gear-change by engaging all gears.
- Check crankshaft axial play (0.03 - 0.12 mm) (0.0012 - 0.0047 in) and fit crankshaft locking bolt.



5.7 Mounting oil filter

- Fit oil filter with rubber gasket onto the connection in the oil filter cover.
- Fit a new O-ring into the oil filter cover groove and use the 3 screws to fix the oil filter cover.



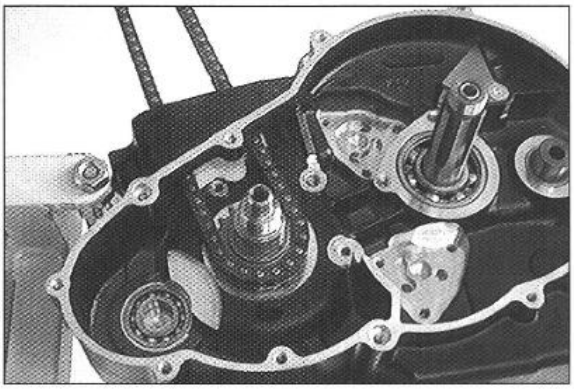
5.8 Mounting the engine sprocket

- Lubricate O-ring (25x2) with oil and slide over countershaft.
- Slide distance bushing ❹ in position so that O-ring is in correct position.

! CAUTION !

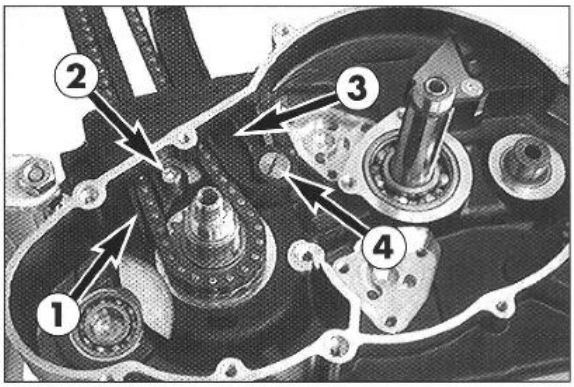
DO NOT REVERSE DUST LIP OF THE SHAFT SEAL.

- Fit the sprocket with the collar facing the housing.
- Apply Loctite 242 to thread of sprocket screw.
- Mount spring retainer and sprocket screw.
- Apply counterpressure with the sprocket holding spanner (510.12.012.000) and tighten sprocket screw to 40 Nm (30 ft.lb.).

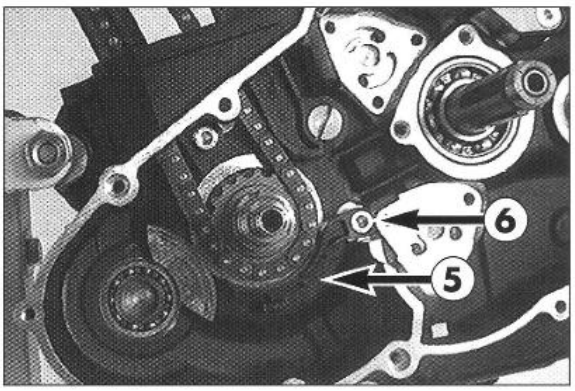


5.9 Timing gear, timing chain

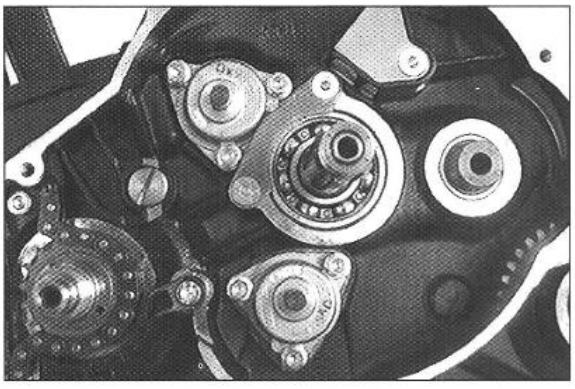
- Insert woodruff key for timing gear into crankshaft and fit timing gear onto crankshaft with high collar towards housing.
- Fit timing chain onto timing gear and draw up through chain tunnel.



- Insert the timing chain guide ❶, apply Loctite 242 to the allan head screw ❷ and mount.
- Apply Loctite 242 to the thread of the flat-head screw ❹.
- Fasten timing chain tensioner ❸ with flat head screw.
- Check timing chain tensioner for smooth operation.

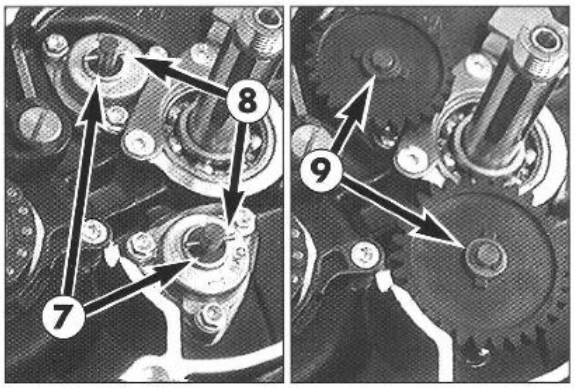


- Insert the safety device ❺, apply Loctite 242 to the allan head screw ❻ and mount.



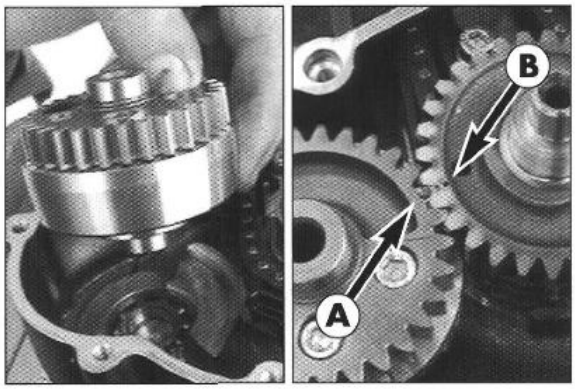
5.10 Oil pumps

- Clean the sealing surfaces and install the oil pumps in the engine housing.
- Degrease the threads and use Loctite 242 to secure the screws in their position.



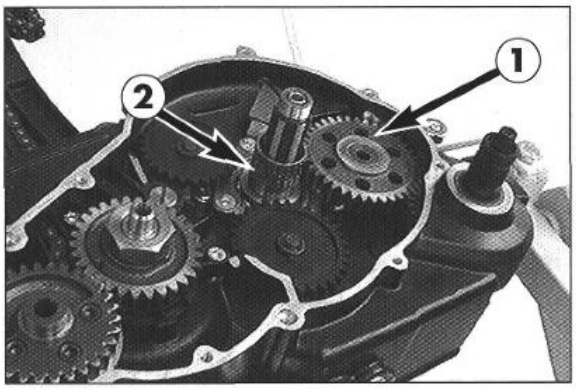
- Put the stop discs (8.5x14.5x0.5 mm) ❼ onto the oil pump shafts.
- Insert the bearing needles ❽ into the oil pump shafts and slide on the oil pump gears (high collars must face the casing; the small oil pump gear must face the upper oil pump).
- Put on the upper stop discs ❾ and mount the locking discs.

NOTE: SX-MODELS HAVE ONLY ONE OIL PUMP.



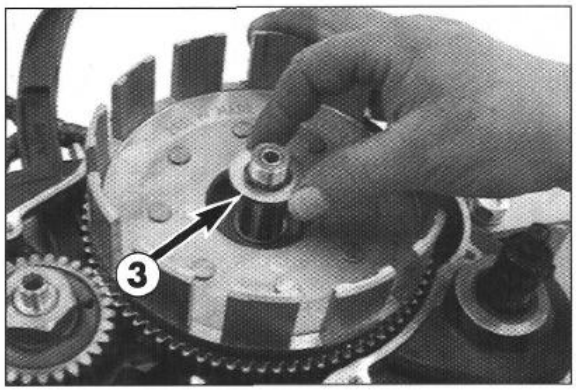
5.11 Balancer shaft, primary pinion

- Fit balancer shaft in the bearing.
- Mount woodruff key in crankshaft and place primary pinion on the crankshaft. When doing so, adjust the teeth of the primary pinion and the balancer shaft in such a way that the markings Ⓐ and Ⓑ coincide.
- Apply Loctite 242 to the crankshaft thread.
- Mount spring ring and hexagon nut and tighten hexagon nut to 170 Nm (125 ft.lb.).

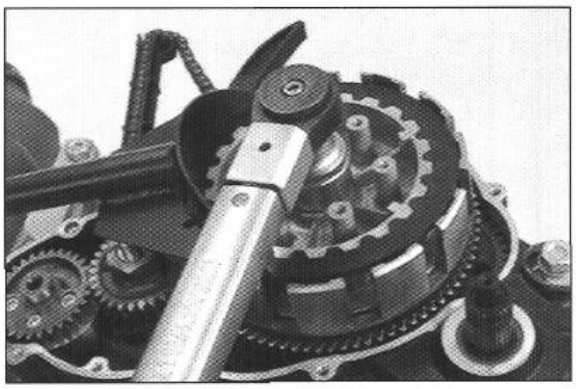


5.12 Clutch

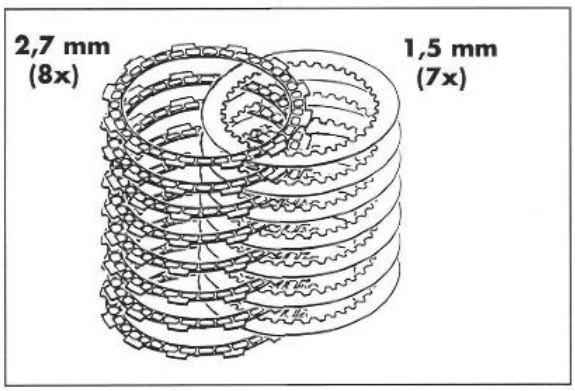
- Fit kickstarter intermediate gear ❶ onto counter shaft with clearance space towards housing.
- Slide the inner ring and the needle bearing ❷ onto the main shaft.



- Fit outer clutch hub and outer stop disc (22.2x35x3 mm) ❸.



- Degrease the thread of the main shaft.
- Place inner clutch hub and a new safety plate on the main shaft.
- Coat the thread of the main shaft with Loctite 242 and mount hexagon nut.
- Fit clutch holder (583.29.003.000) and tighten hexagon nut to 80 Nm (60 ft.lb.).
- Remove clutch holder.
- Check clutch hub and main shaft for smooth operation and axial play.
- Secure outer clutch hub hexagon nut by bending the safety plate up into place.

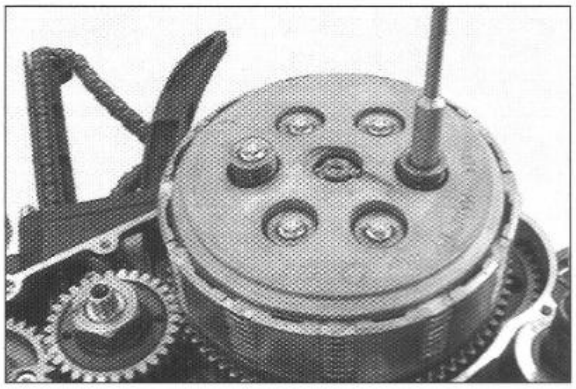


5.12.1 Clutch discs

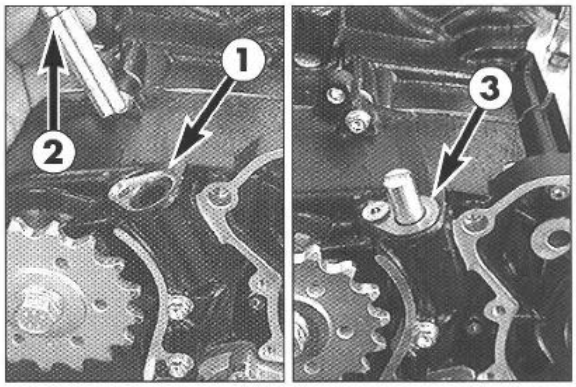
- For arrangement of clutch disks, see illustration.

! CAUTION !

MOUNT ALL STEEL DISKS WITH THE SHARP EDGE FACING DOWNWARD.

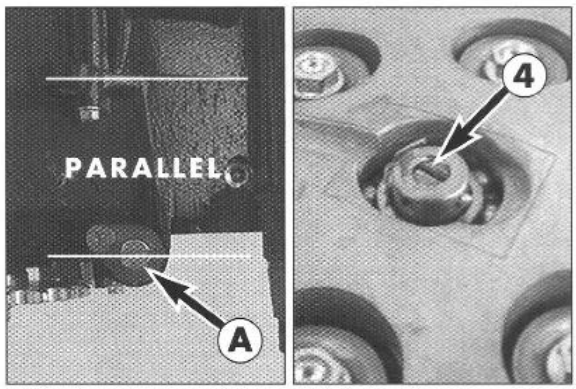


- Grease the end of the push rod with Molycote grease and fit the pressure cap together with the push rod.
- Place the springs in the pressure cap and fit the HH srews with spring retainers.
- Secure carefully to 6 Nm in a diagonal pattern, to avoid any damage to the inner clutch hub thread.



5.12.2 Mounting the clutch release shaft

- Oil needle bushings in engine housing.
- Slide the sealing cup ❶ with its open side down into the housing.
- Check for the right position of the circlip on the clutch release shaft ❷
- Slide the release shaft into the housing until it lies on the clutch push rod.
- Turn the release shaft clockwise until it glides a bit further into the housing. The push rod now sits on the release shaft.
- Apply Loctite 242 to the screw.
- Use the screw to fix the retaining bracket ❸.

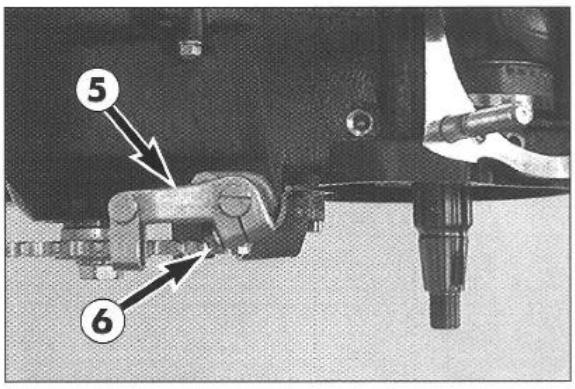


5.12.3 Adjustment of clutch release

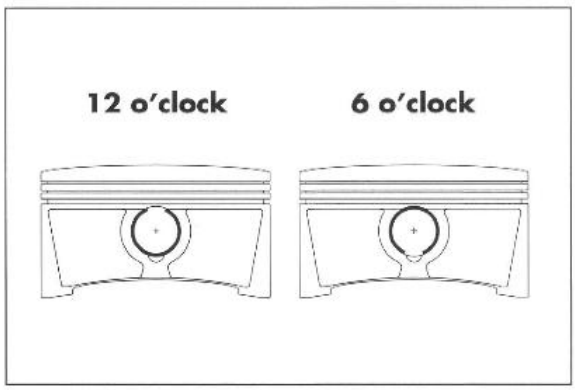
! CAUTION !

TO MAKE SURE THAT THE CLUTCH DISENGAGES PERFECTLY, THE CLUTCH RELEASE MUST BE PROPERLY ADJUSTED.

- Turn the clutch release shaft clockwise to stop.
- The slot Ⓐ on the front side of the release shaft should now be parallel to the sealing surface of the housing (see ill.).
- Correction is possible by turning the push rod ❹ in or out.
- Once you have completed the adjustment, the push rod is to be secured with a pin.



- To mount the clutch release lever ❺, turn the clutch release shaft clockwise as far as stop and fit the release lever as illustrated.
- Tighten clamp screw ❻.
- Disengage clutch and check whether the pressure cap lifts evenly.

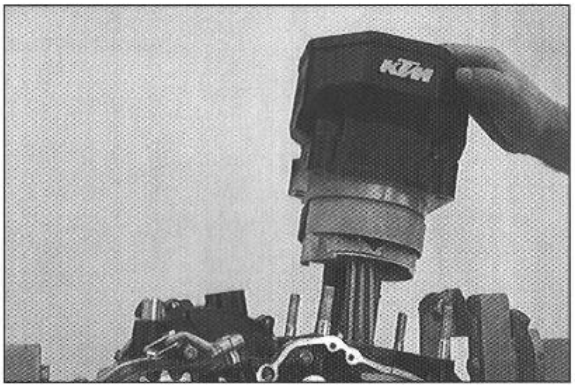


5.13 Piston, cylinder

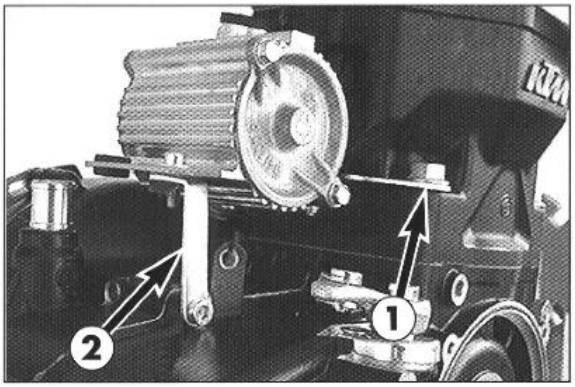
- Lubricate the piston pin eye in the connecting rod and the piston pin with oil.
- Mount piston and secure piston pin with 2 new wire circlips.

! CAUTION !

THE ARROW ON THE PISTON HEAD MUST POINT IN THE DIRECTION OF TRAVEL.
MOUNT WIRE CIRCLIPS IN „6 O'CLOCK" OR „12 O'CLOCK" POSITION (SEE ILL.).

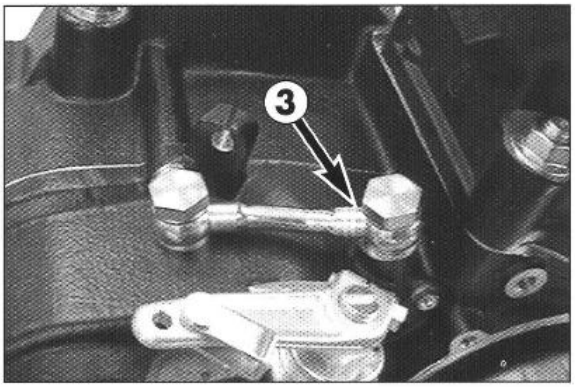


- Cut off the section of the housing gasket protruding around the cylinder flange and mount 2 dowels.
- Apply sealing compound to the sections near the chain tunnel and mount the cylinder base gasket.
- Oil the piston, adjust the piston rings (piston rings must be turned 120 ° against each other) and mount the piston mounting ring (400 cm^3 ➜ 580.12.015.089 / 620 cm^3 ➜ 580.12.015.101) .
- Slide the cylinder over the piston and remove the mounting ring.



- Hook in the preassembled microfilter with the holding device onto the rear studs and mount the collar nuts ❶ at the cylinder base.
- Tighten collar nuts with 40 Nm (30 ft.lb.) crosswise.
- Then mount the bracket ❷ and attach the microfilter.

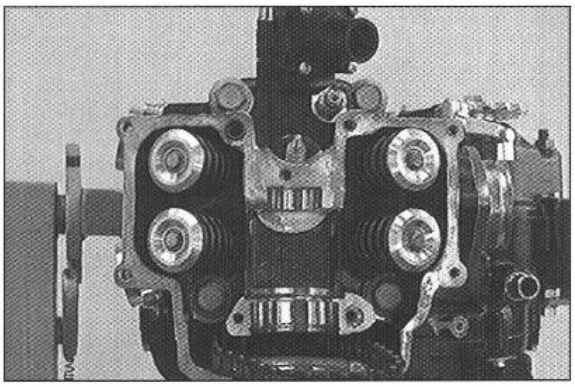
NOTE: THE UPPER EDGE OF THE PISTON IS HIGHER THAN THE UPPER EDGE OF THE CYLINDER WHEN THE CYLINDER IS SCREWED DOWN.



- Mount oil line, copper seal rings and banjo bolts.
- Tighten banjo bolts with 20 Nm (15 ft.lb).

! CAUTION !

MOUNT THE RING PIECE WITH THE CENTER PUNCH POINT ❸ IN FRONT.

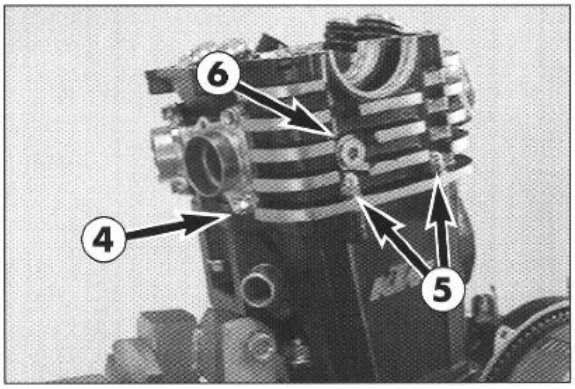


5.14 Cylinder head

- Make sure that both dowels are mounted in the cylinder.
- Mount cylinder head gasket and fit cylinder head.
- Oil the 4 screw (threads and contact surfaces od screw head) and then mount with new copper seal rings.
- Tighten collar screws crosswise in three rounds up to the prescribed torque of 50 Nm (37 ft.lb.). During the first round only tighten until a slight resistance is felt.

! CAUTION !

MODELS OF 1997 OR NEWER HAVE SHORTER DOWELS IN THE CYLINDER (9.5 MM INSTEAD OF 12 MM). IF THE CYLINDER HEAD DOES NOT REST PROPERLY AGAINST THE CYLINDER, CHECK DOWEL LENGTH BEFORE TIGHTENING THE CYLINDER HEAD SCREWS !

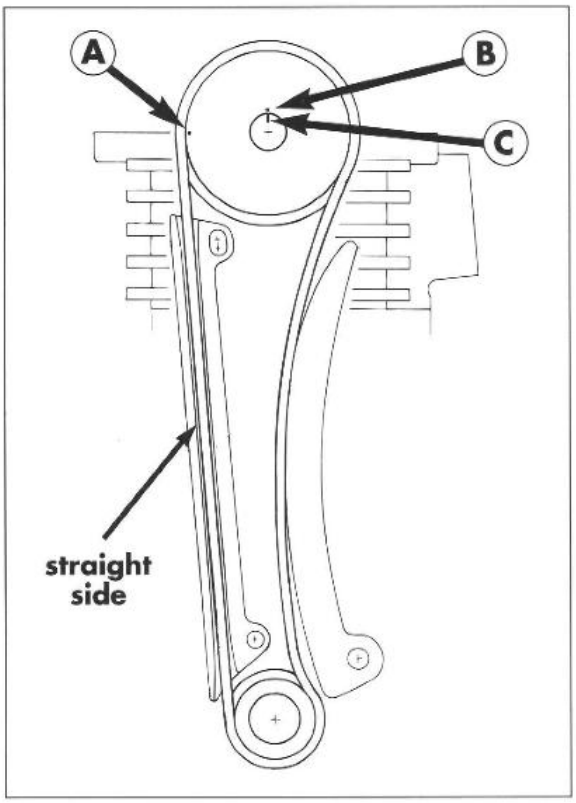


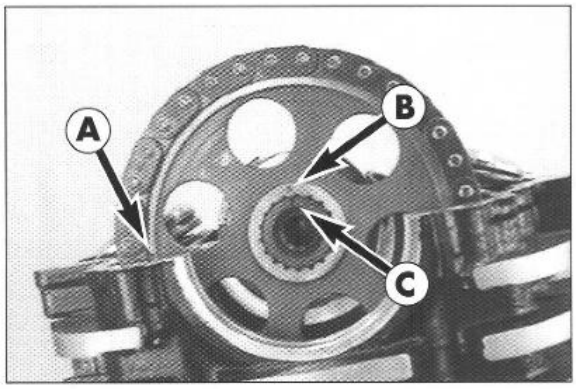
- Mount M8 collar nuts ❹ on the front and rear side of cylinder and tighten.
- Fit the two M6 cap nuts ❺ and tighten.
- Degrease chain guide screw ❻, apply Loctite 242, mount and tighten with 30 Nm (22 ft.lb.).

! CAUTION !

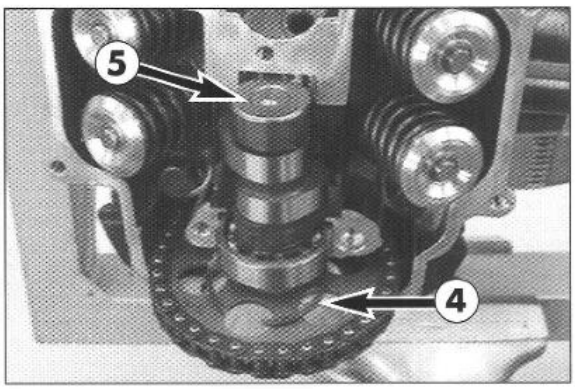
BEFORE MOUNTING ENSURE THAT THE RECESS OF THE TIMING CHAIN GUIDE IS VISIBLE THROUGH THE THREADED HOLE. IF THIS IS THE CASE, THE CHAIN GUIDE BOLT CAN BE MOUNTED WITHOUT APPLYING FORCE.

5.15 Timing

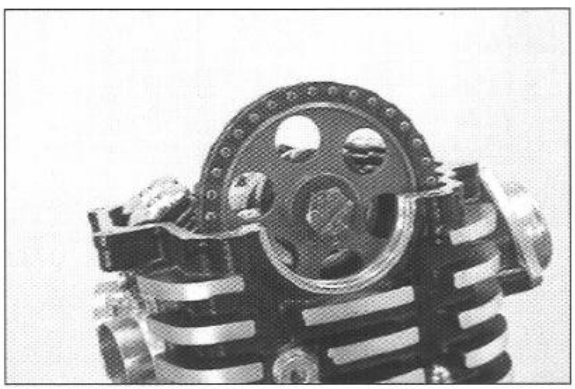




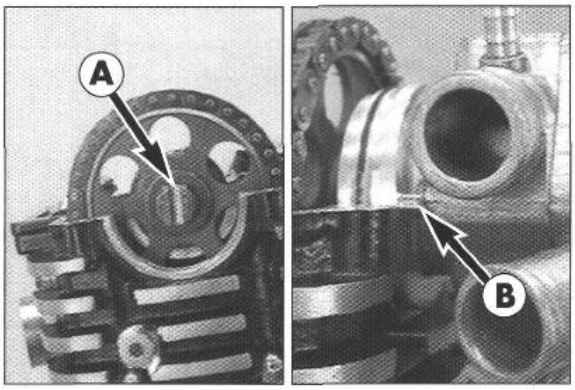
- Fit the camshaft gear into the timing chain so that mark ❹ (a point) is aligned with the top surface of the cylinder head when the timing chain strand tensioned.
- Tilt engine to one side and place cieclip ❹ on camshaft gear.
- Slide grooved ball bearing flush onto the preassembled camshaft and fit the camshaft into the camshaft gear so that the mark ❸ and mark ❻ are aligned.



- Lubricate the needle bushing ❺ with oil and slide it onto the camshaft.
- Mount camshaft together with bearing and circlip ❹ into cylinder head.



- Degrease the camshaft thread and the HH screw, and apply Loctite 242.
- Mount HH screw together with locking disc and disc (10x32x3 mm) and tighten with 35 Nm (25 ft.lb.).

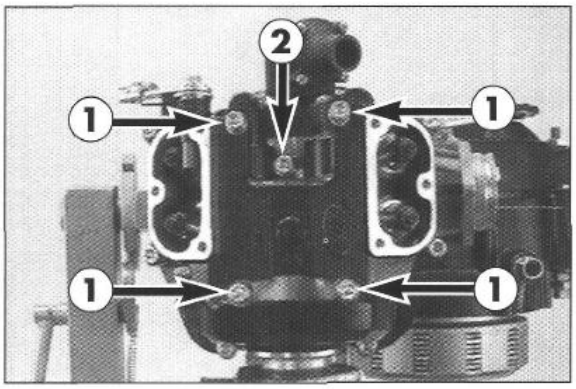


5.16 Water pump

- Loosen crankshaft locking bolt and turn crankshaft until groove Ⓐ is at a position vertical to the sealing surface for the cylinder head top section.
- Coat O-ring of water pump with sealing compound (Three-Bond) and carefully mount the water pump. The flat part of the water pump shaft must be introduced into the groove of the HH screw.

! CAUTION !

THE MARKING Ⓑ LOCATED ON THE HOUSING OF THE WATER PUMP MUST BE FLUSH TO THE SEAL SURFACE.



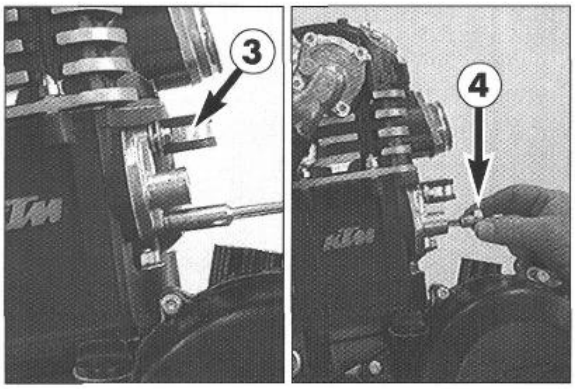
5.17 Cylinder head top section

- Clean the sealing area of the cylinder head top section and apply a thin layer of sealing compound.
- Fit dowel in the area of the spark plug.
- Carefully position cylinder head top section (do not jam with water pump) and mount screws.

! CAUTION !

COPPER SEAL RINGS MUST BE FITTED TO THE 5 ALLAN HEAD SCREWS ❶ AND ❷.

- Tighten screws ❶ (quality 12.9) to 20 Nm (15 ft.lb) diagonally.
- Tighten all other screws of the cylinder head top section with 8 Nm (6 ft.lb).

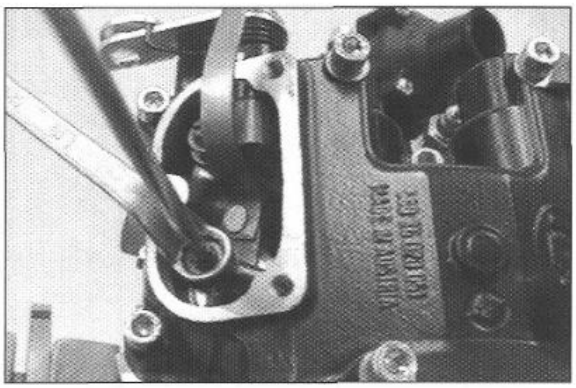


5.18 Automatic tensioner

- Fit preassembled automatic tensioner (see 4.11.1) with gasket into the cylinder and mount 2 allan head screws with copper seal rings.
- Don't forget to mount the clamp for the ignition wiring harness ❸.
- Fit pressure spring and plug ❹ with gasket and tighten with 20 Nm (15 ft.lb).

5.19 Automatic decompression testing

- Rotate the crankshaft in the usual direction of rotation (i.e. forward). After every other rotation, the decompression cam must be clearly heard to click as it disengages.

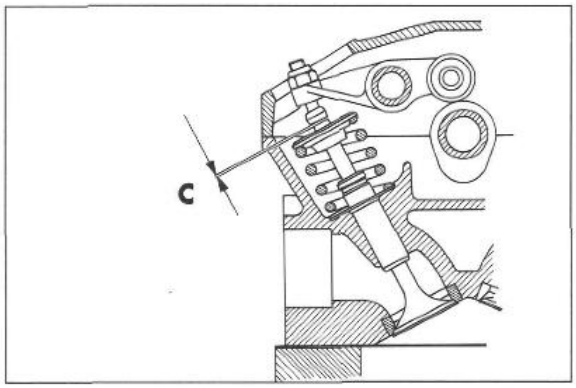


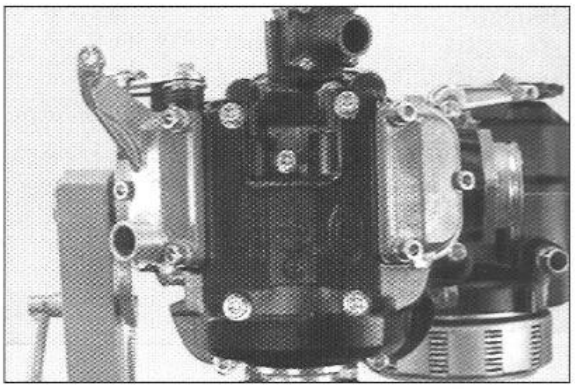
5.20 Adjustment of valve play

- Adjust piston to ignition top dead center and screw crankshaft locking bolt back in.
- Valve play is measured at cold engine between valve stem and adjusting screw.

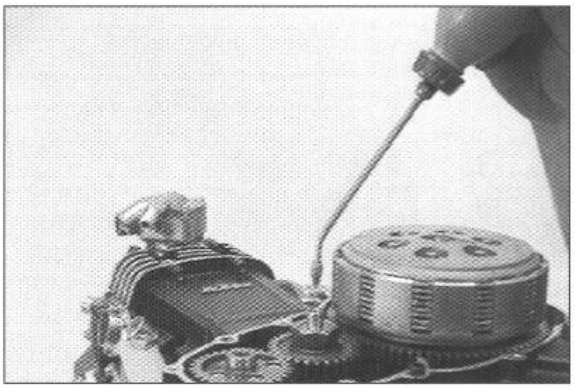
Model	400	620 (SX)	620 (SC - EGS)
Valve clearance - intake	0.20 mm 0.008 in	0.20 mm 0.008 in	0.15 mm 0.006 in
Valve clearance - exhaust	0.20 mm 0.008 in	0.20 mm 0.008 in	0.15 mm 0.006 in

- Tighten counternuts with 20 Nm (15 ft.lb.).
- Remove the crankshaft locking bolt.



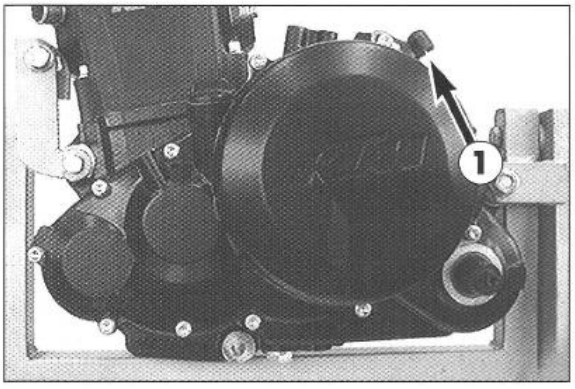


- Mount both valve covers with new gaskets and screws with copper seal rings.
- Tighten screws with 8 Nm (6 ft.lb).
- Insert and tighten spark plug with 20 Nm (15 ft.lb).

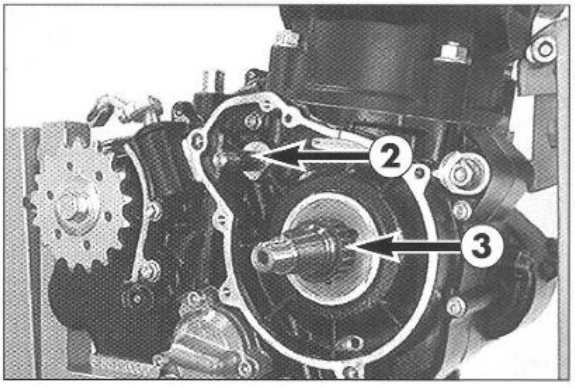


5.21 Clutch cover

- Pour approx. 30 ml of oil into the crankshaft journal hole.

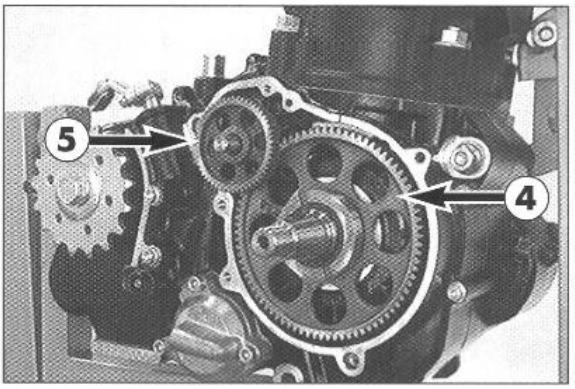


- Make sure that the two dowels are mounted, fit new gasket and fix with dabs of grease.
- Apply grease to the shaft seal ring in the clutch cover and mount clutch cover.
- Fit screws and bump rubber ❶ for kickstarter.
- Tighten screws with 8 Nm (6 ft.lb).

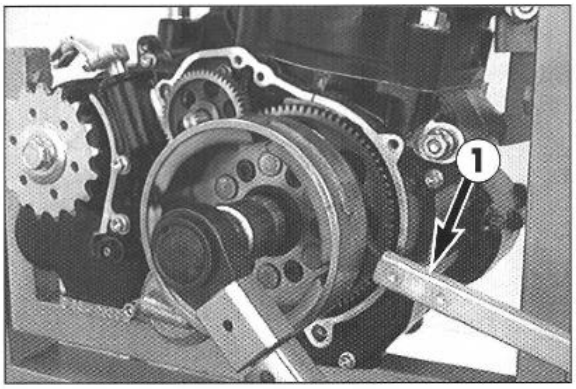


5.22 E-starter drive

- Insert the woodruff key into the crankshaft.
- Slide 2 needle bearings ❷ onto the bearing pin of the reduction gear.
- Slide the needle bearing ❸ onto the crankshaft.
- Oil the needle bearings.

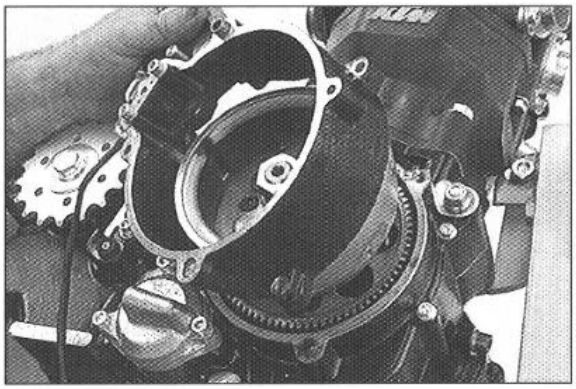


- Mount the freewheel gear ❹ and the reduction gear ❺.

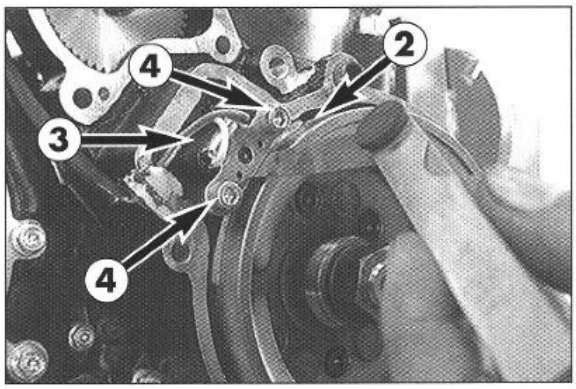


5.23 Ignition (Kokusan)

- Degrease the cones of flywheel and crankshaft.
- Heat the flywheel to approx. 80° C (176° F).
- Thoroughly oil the freewheel and mount the flywheel.
- Mount disk with the nut.
- Use the holding tool ❶ (584.29.012.000) to hold the flywheel and tighten the hexagon nut with 150 Nm (110 ft.lb).



- Insert 2 dowels into the housing.
- Apply silicone to both sealing surfaces and mount a new gasket.
- Mount the preassembled starter flange and use 3 screws to fasten the starter flange.

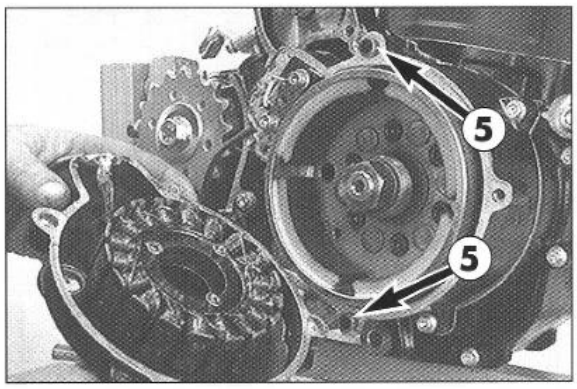


5.23.1 Adjusting the pulse generator

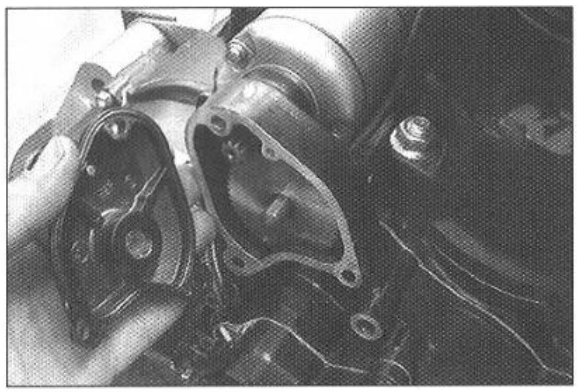
- Turn the flywheel until the elevated section of the flywheel ❷ coincides with the pulse generator ❸.
- Use a feeler gauge to measure the distance between the pulse generator and the flywheel.

SETPOINT VALUE: 0.75 MM (0.03 IN) +/- 0.2 MM (0.008 IN)

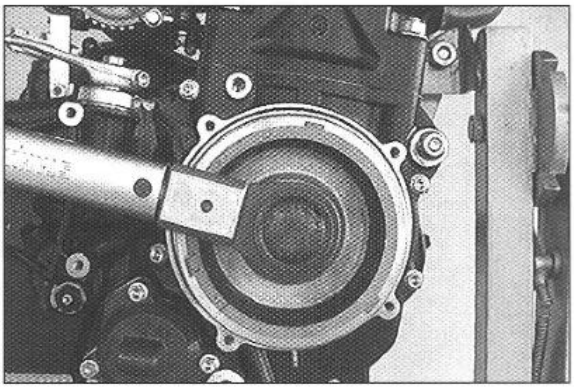
- Undo the 2 screws ❹ and readjust the distance if necessary.



- Insert 2 dowels ❺.
- Apply silicone to both sealing surfaces and mount a new gasket.
- Mount ignition cover and tighten all screws.

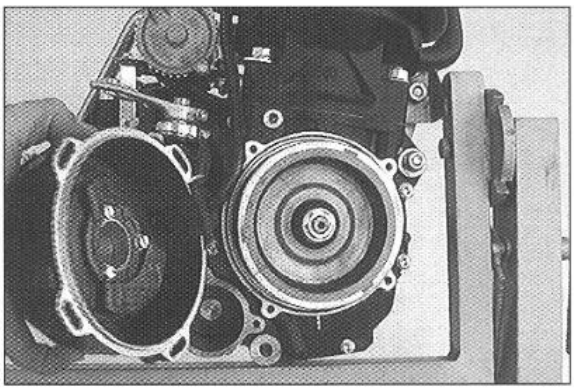


- Insert a new O-ring into the groove of the starter cover and fasten the starter cover with 3 screws.

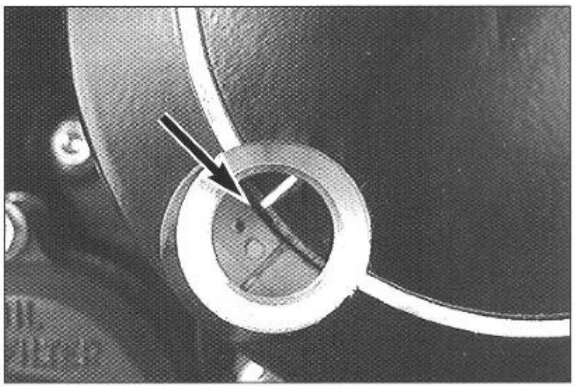


5.24 Ignition (SEM)

- Block crankshaft with crankshaft locking bolt.
- Place woodruff key in crankshaft.
- Clean cones of crankshaft and flywheel and mount flywheel.
- Fit spring washer and collar nut.
- Tighten collar nut to 60 Nm (45 ft.lb.).
- Place the O-ring into the groove of the motor housing.

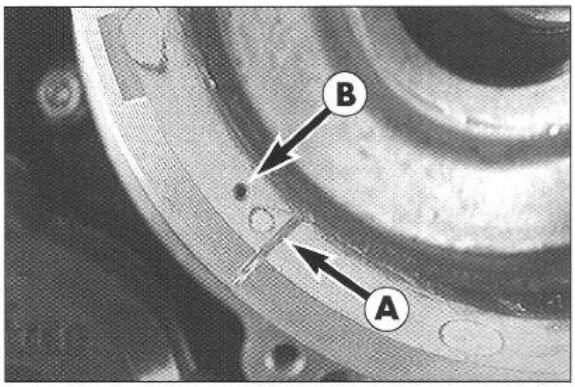


- Fit preassembled ignition cover and mount the 4 screws but do not tighten.



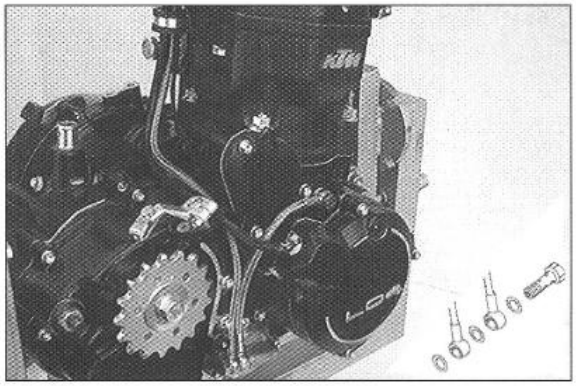
5.24.1 Adjustment of ignition point (SEM)

- The ignition point is adjusted after the crankshaft locking bolt has been mounted.
- Turn ignition cover so that the marks on the stator and the flywheel are aligned.
- Tighten the 4 screws of the ignition cover.
- Finally, mount the ignition cover plug



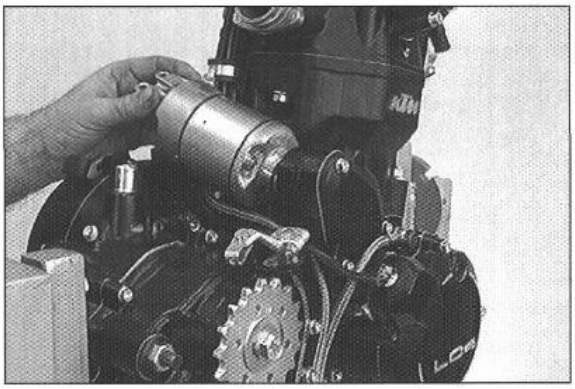
NOTE: THE 620 LC4 ENGINE NEEDS LESS PRE-IGNITION THAN THE 400 LC4 ENGINE. ON ACCOUNT THAT BOTH MODELS HAVE THE SAME IGNITION SYSTEM, THE 620 LC4 MODEL HAS AN ADDITIONAL MARKING (2 MM BORE) ON THE FLYWHEEL.
THE PROCEDURE OF IGNITION POINT ADJUSTMENT IS THE SAME.

- In the 400 LC4 model the marking Ⓐ (notch) must coincide with the marking on the stator.
- In the 620 LC4 model the marking Ⓑ (2 mm bore) must coincide with the marking on the stator.



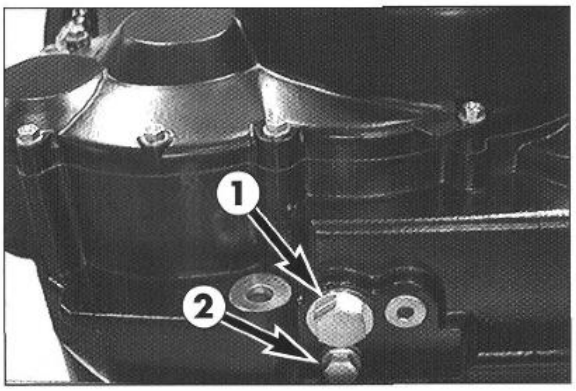
5.25 Oil lines

- Mount oil lines.
- Position oil lines and wiring harness as illustrated.



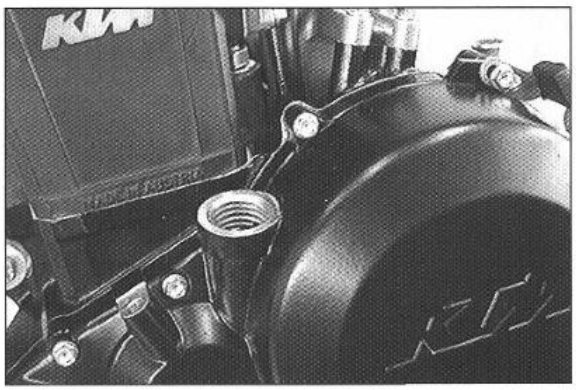
5.26 E-starter motor

- Slightly oil the O-ring.
- Mount the starter motor and fix it with 2 screws.



5.27 Engine oil

- Mount oil drain plug ❶ with seal ring and tighten with 30 Nm (23 ft.lb).
- Mount the magnetic screw ❷ and tighten with 20 Nm (15 ft.lb).



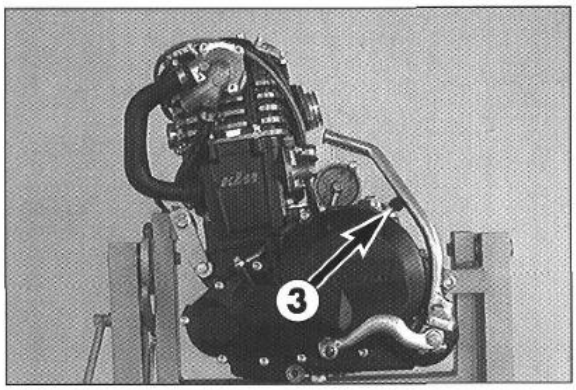
- Remove the plug on the clutch cover and fill in motor oil (quality and viscosity see below).

! CAUTION !

- ONLY USE HIGH-QUALITY OILS MEETING OR SURPASSING THE QUALITY REQUIREMENTS OF API CLASSES SF, SG, OR SH (FOR SPECIFICATIONS SEE CONTAINERS).
- INSUFFICIENT OIL OR POOR QUALITY OIL RESULTS IN PREMATURE WEAR OF THE ENGINE.
- YOU MAY USE EITHER MINERAL OILS OR SYNTHETIC OILS FULFILLING THE ABOVE CRITERIA.

API: SF, SG, SH

TEMPERATURE 0°C 32°F	
−	+
10W 40	15W 40
10W 50	15W 50
10W 60	15W 60



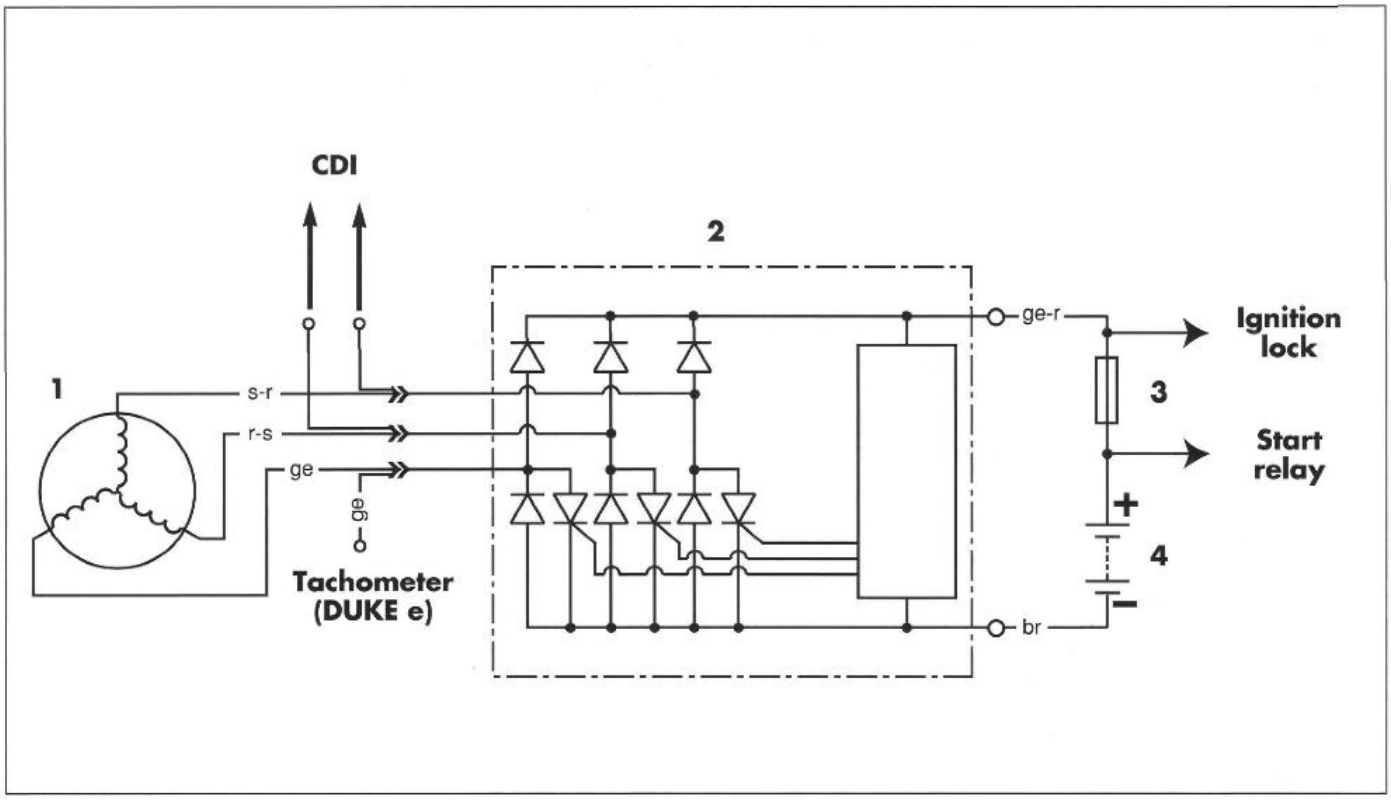
5.28 Kickstarter, shift lever

- Mount kickstarter, fit V-gasket on shift shaft and mount shift lever.
- Then position the bump rubber ❸ for the kickstarter to rest against the kick-starter.

6.0 Electrical

Models with electric starter (EGS-E, RXC e, LSE, DUKE e)

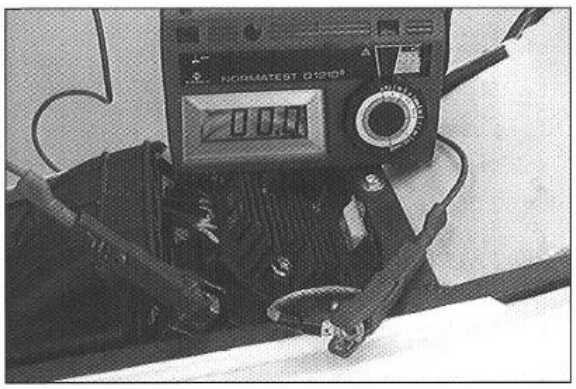
Models without electric starter (SC,EGS)



bl .....blue
br .....brown
ge .....yellow
gr .....grey
g .....green
o .....orange
r .....red
ra .....pink
s .....black
v .....violet
w .....white

6.1 Charging system

❶ Generator
❷ Regulator-rectifier
❸ Main fuse (10 A)
❹ Battery

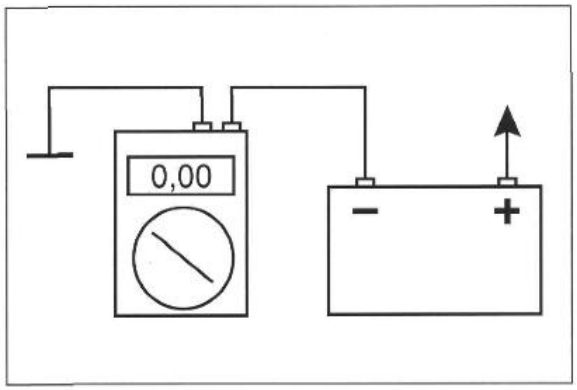


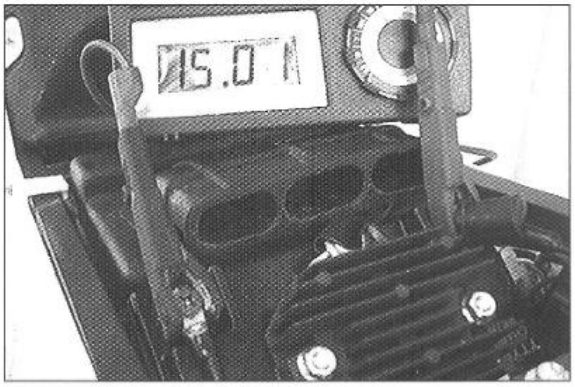
6.1.1 Leakage inspection

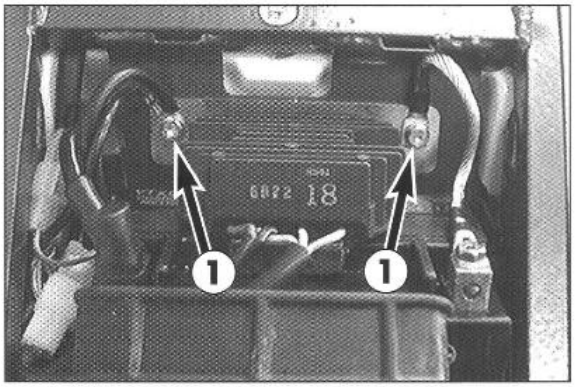
The drop test must be performed before checking the voltage regulator/rectifier
- Turn off the ignition and disconnect the ground wire from the battery.
- Insert an amperemeter between the ground wire and the negative pole of the battery.

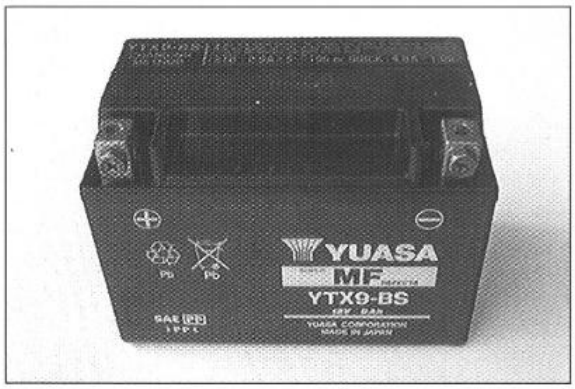
Setpoint value: max. 1 mA

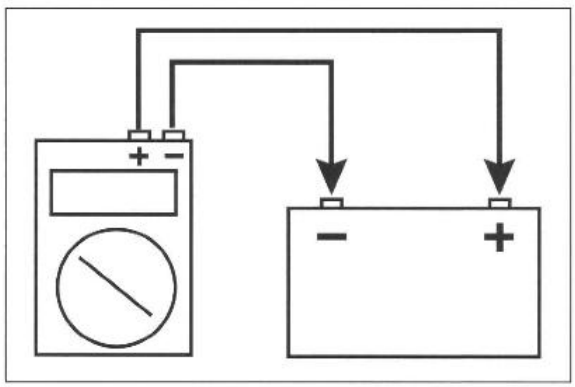
- Check for power consumers, should the measured value exceed the indicated maximum value.
  Example:
- defective voltage regulator-rectifier
- leak currents in the socket connectors, in the ignition lock or in the starter relay.











6.1.2 Charging voltage / checking the voltage regulator-rectifier

NOTE: THE VALUES STATED BELOW APPLY ONLY TO FULLY CHARGED BATTERIES (MINIMUM CHARGING LEVEL 90%).

- Start the engine and switch on the low beam.
- Connect a voltmeter to both battery connections.
- Accelerate the engine to a speed of 5000 rpm and read off the voltage.

NOMINAL VALUE: 14.0 - 15.0 V

In the case of a significant deviation from the nominal value:
- Check the connector between the stator and the voltage regulator-rectifier and the connector between the voltage regulator-rectifier and the cable tree.
- Check the stator.
- Replace the voltage regulator-rectifier.

6.1.3 Removing the battery

- Remove the seat.
- Disconnect first the negative and then the positive pole of the battery.
- Remove the screws ❶ and swing the battery support with the voltage regulator-rectifier sideways.
- Remove the battery.
- When reinstalling the battery, connect the negative pole last.

NOTE: FOLLOW THE INSTRUCTIONS OF THE MANUFACTURER WHEN FILLING A NEW BATTERY. THE RELEVANT SAFETY INSTRUCTIONS ARE ALSO CONTAINED IN THE USER MANUAL SUPPLIED WITH THE BATTERY.

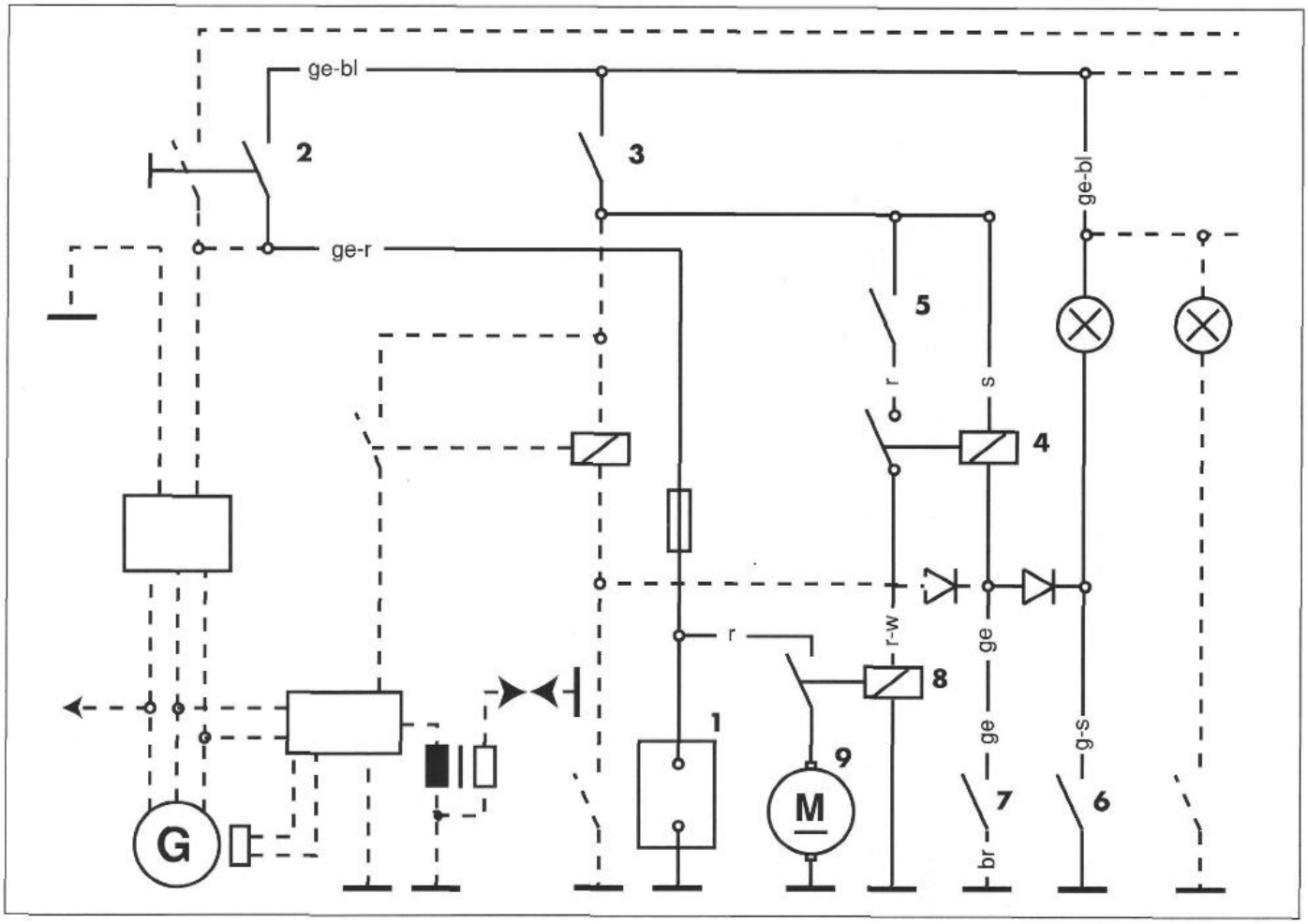
6.1.4 Charging the battery

- Remove the battery and check the charging level. Use a voltmeter to measure the voltage between the battery poles (off-load voltage).
- Accurate results can only be obtained if the battery has neither been charged nor discharged during a period of 30 minutes preceding the measuring.
- If the battery is empty, it can be recharged for a maximum period of 10 hours at 0.8 A and a maximum of 14.4 V.

! CAUTION !

- TO AVOID DAMAGE, DO NOT REMOVE THE LOCKING BAR
- ALWAYS CONNECT THE BATTERY TO THE CHARGING UNIT BEFORE TURNING THE CHARGING UNIT ON.
- WHEN RECHARGING THE BATTERY IN CLOSED ROOMS ENSURE SUFFICIENT VENTILATION. EXPLOSIVE GASES ARE RELEASED DURING THE BATTERY CHARGING PROCESS.
- CHARGING TIME AND CHARGING VOLTAGE SHOULD NOT EXCEED THE STATED VALUES. OTHERWISE ELECTROLYTE WILL BE RELEASED THROUGH THE SAFETY VALVES.
- AVOID QUICK CHARGING IF POSSIBLE.

off load voltage Volt	charging level %	charging time 0.8 A	charging voltage
>12.7	100	—	max. 14.4 V
~12.5	75	4 h	
~12.2	50	7 h	
~12.0	25	11 h	
~11.8	0	14 h	



❶ Battery
❷ Ignition lock
❸ Emergency off switch
❹ Auxiliary relay
❺ Tip switch built in emergency off switch
❻ Neutral switch
❼ Clutch switch
❽ Start relay
❾ Starter motor

bl .....blue
br .....brown
ge .....yellow
gr .....grey
g .....green
o .....orange
r .....red
ra .....pink
s .....black
v .....violet
w .....white

6.2. Electric starter system

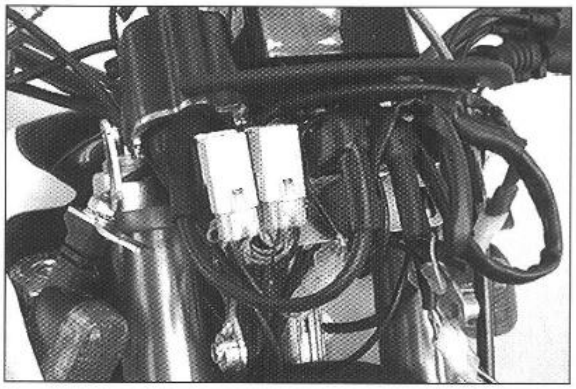
The system is equipped with a safety mechanism. Electric starting is only possible when

- the ignition lock is in the ON position;
- the emergency OFF switch is in the RUN position;
- the transmission is switched to neutral or the clutch is pulled.

Function of the electric starter system:
From the battery ❶ the battery voltage is transmitted via the ignition lock ❷ and the emergency OFF switch ❸ to the coil of the auxiliary starting relay ❹ and to the tip switch ❺.
The contact of the auxiliary starting relay prevents starting unless at least one of the following requirements is met:

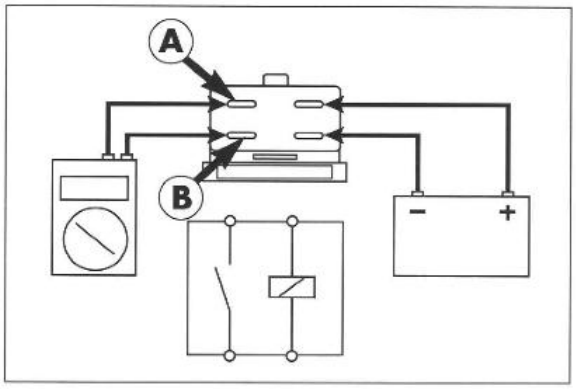
- The transmission must be switched to neutral (neutral switch ❻ is closed).
- The clutch must be pulled (clutch switch ❼ must be closed).

When the tip switch ❺ is operated, the starter motor ❾ is switched on via the starter relay ❽.



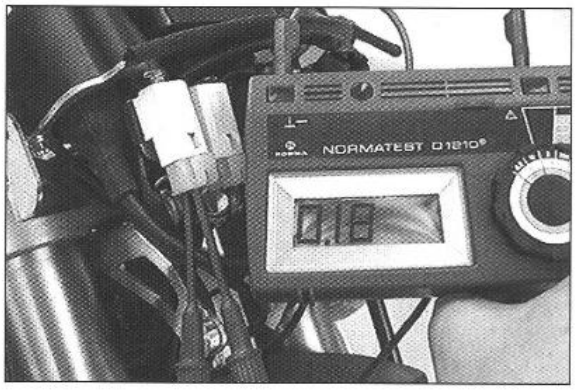
6.2.1 Check start auxiliary relay

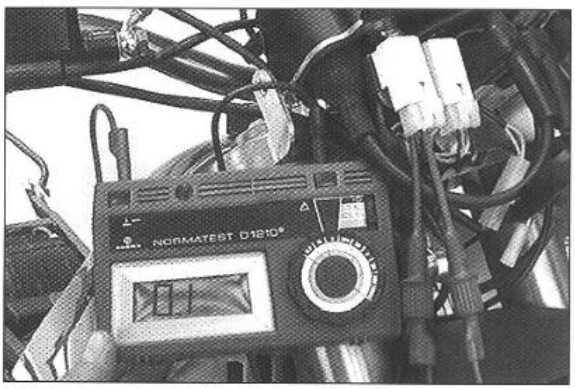
– Remove headlight mask and remove the start auxiliary relay (cable colours red and red-white).



– Connect the start auxiliary relay to a 12 V battery as shown in the illustration.
– Use an ohmmeter to measure the continuity between the terminals Ⓐ and Ⓑ.

READING 0 Ω RELAY INTACT
READING ∞ Ω RELAY DEFECT





6.2.2 Checking the auxiliary starting relay for faultless operation

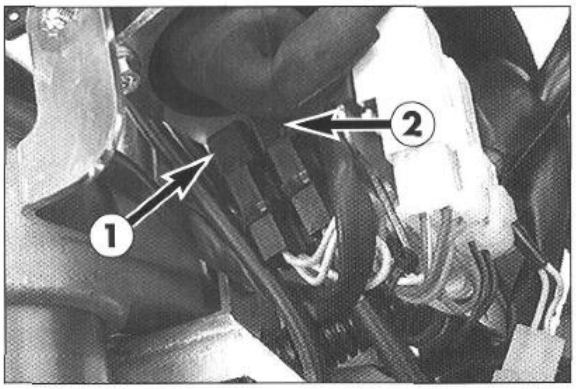
Preparation:

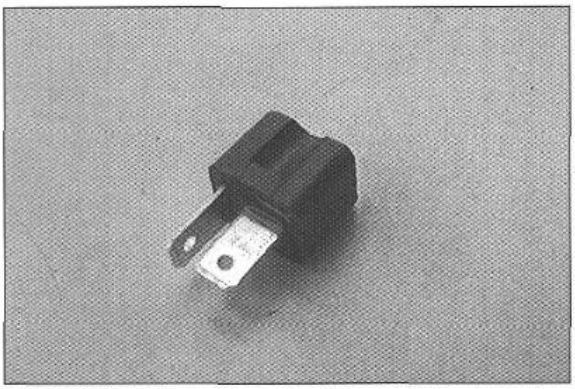
– Connect an ohmmeter or a continuity tester to the cables of the auxiliary starting relay (colors: red and red/white).

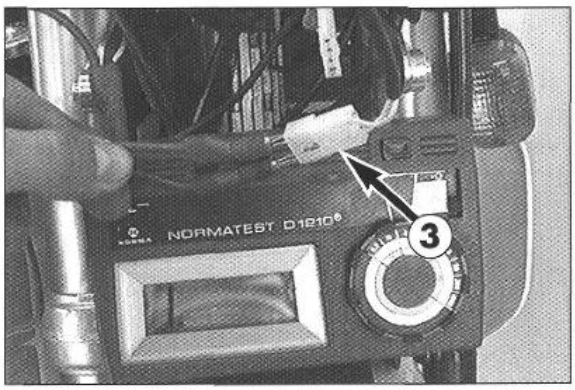
– Perform the tests in the order indicated below. The auxiliary starting relay must respond in either of the following two cases:

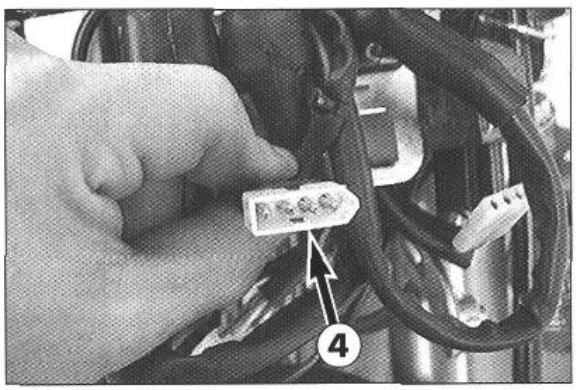
- Put in a gear and slowly pull the clutch lever. The auxiliary starting relay should respond when the lever is pulled approximately half of the overall distance. If this is not the case, please check the clutch switch. Keep an eye on the neutral control lamp while performing this test. The neutral control lamp should not light up. If it lights up, check the diode with the cable colors yellow and green/black.
- Switch the transmission to neutral without previously pulling the clutch. The auxiliary starting relay should now connect and be tripped as soon as a gear is put in. If this is not the case, please check the diode in the connector with the cable colors yellow and green/black and the neutral switch.

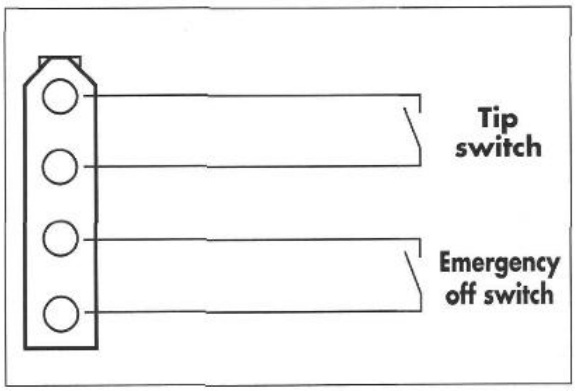
NOTE: CONNECTING OF THE AUXILIARY STARTING RELAY IS ALWAYS ACCOMPANIED BY A FAINT CLICKING SOUND. THE OHMMETER OR CONTINUITY TESTER INDICATES CONTINUITY WHILE THE AUXILIARY STARTING RELAY IS ON.











6.2.3 Checking the diodes

NOTE: DIODES CONDUCT CURRENT ONLY IN THE DIRECTION INDICATED BY THE ARROW, PREVENTING THE CONDUCTION OF CURRENT IN THE OPPOSITE DIRECTION.

Two different kinds of diode defects can be distinguished:
- The diode conducts no current at all.
- The diode conducts current in both directions.

Diode defects can lead to different kinds of trouble, depending on the type of defect.

NOTE: BOTH DIODES ARE THE SAME TYPE AND REQUIRE THE SAME TESTING PROCEDURE. THEY ARE EACH LOCATED IN A 2-POLE CONNECTOR AND CAN BE IDENTIFIED BY THE COLOR OF THE CABLES LEADING UP TO AND AWAY FROM THE RESPECTIVE CONNECTOR.

Checking the diodes for faultless operation:
- Remove the headlight mask.
- Pull the diode to be tested (❶ or ❷) out of the connector.
- Connect an appropriate ohmmeter to the diode and check for continuity.
- Connect the ohmmeter in the opposite direction and check if the diode prevents current conduction in the opposite direction.

6.2.4 Checking the clutch switch

- Disconnect the clutch switch from the cable tree.
- Connect the ohmmeter to the 2-pole connector ❸ (cable colors: brown/yellow) of the clutch switch and slowly pull the clutch lever.
- The switch must connect when the lever is pulled approximately half of the overall distance.

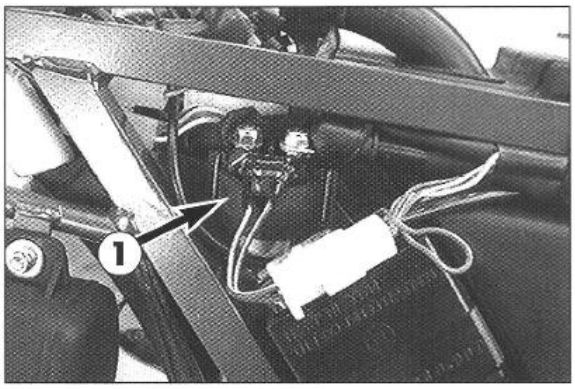
6.2.5 Checking the tip switch and the emergency OFF switch

- Remove the headlight mask.
- Disconnect the 4-pole connector ❹ of the tip switch/emergency OFF switch from the cable tree.
- Use an ohmmeter and test both switches according to the table below (please refer to the sketch for the configuration of the connector).
- Then check all lines for ground contact.

CIRCUIT	POSITION	CONDITION
Emergency off switch	RUN	duct
Emergency off switch	STOP	no duct
Tip switch	operated	duct
Tip switch	not operated	no duct

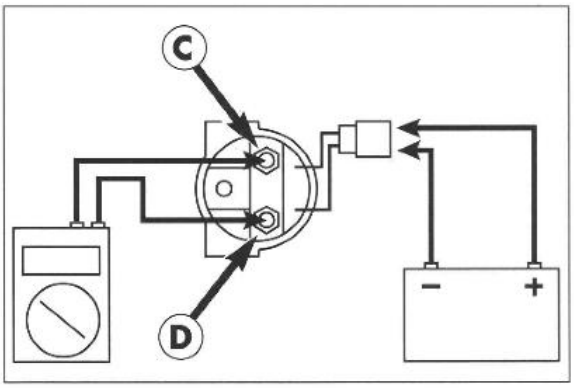
! CAUTION !

THE CONNECTOR OF THE EMERGENCY OFF SWITCH AND THE CONNECTOR OF THE HEADLAMP ARE IDENTICAL. WHEN REASSEMBLING PLEASE BE SURE TO IDENTIFY THE CABLES CORRECTLY BY THEIR COLOR.



6.2.6 Checking the starter relay

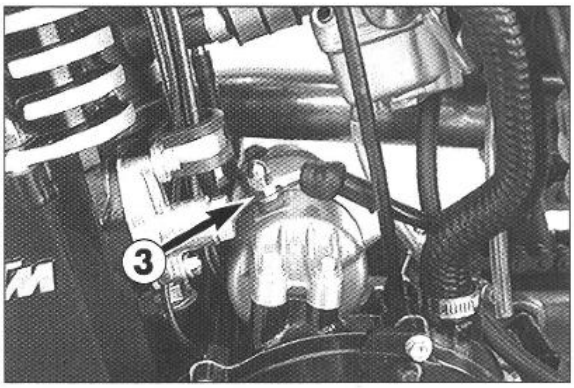
– Remove the seat and the right side cover and disconnect the combination connector ❶ of the starter relay.



– Connect the starter relay to a 12 V battery as indicated in the diagram.
– Check continuity between terminals ❻ and ❶ using an ohmmeter.

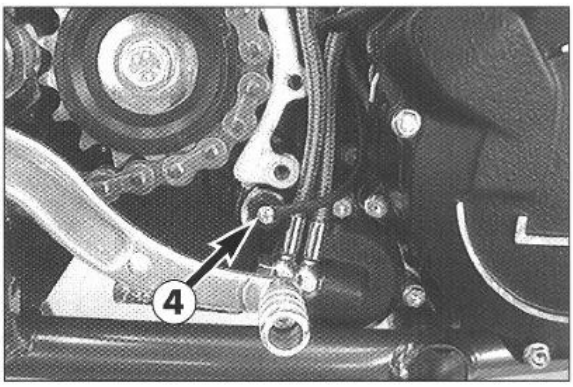
READING: 0 Ω OK
READING: ∞ Ω DEFECT

NOTE: THE RESPONSE OF THE STARTER RELAY IS ACCOMPANIED BY A FAINT CLICKING SOUND.



6.2.7 Checking the electric starter motor

– Switch off the ignition.
– Disconnect the negative pole of the battery and remove the electric starter motor.
– Connect the negative pole of a 12 V battery to the housing of the E starter motor and briefly connect the positive pole of the battery to connection ❸ of the electric starter motor (use thick cables).
– The starter must turn as soon as the circuit is closed.
– If this is not the case, replace the starter.



6.2.8 Checking the neutral switch

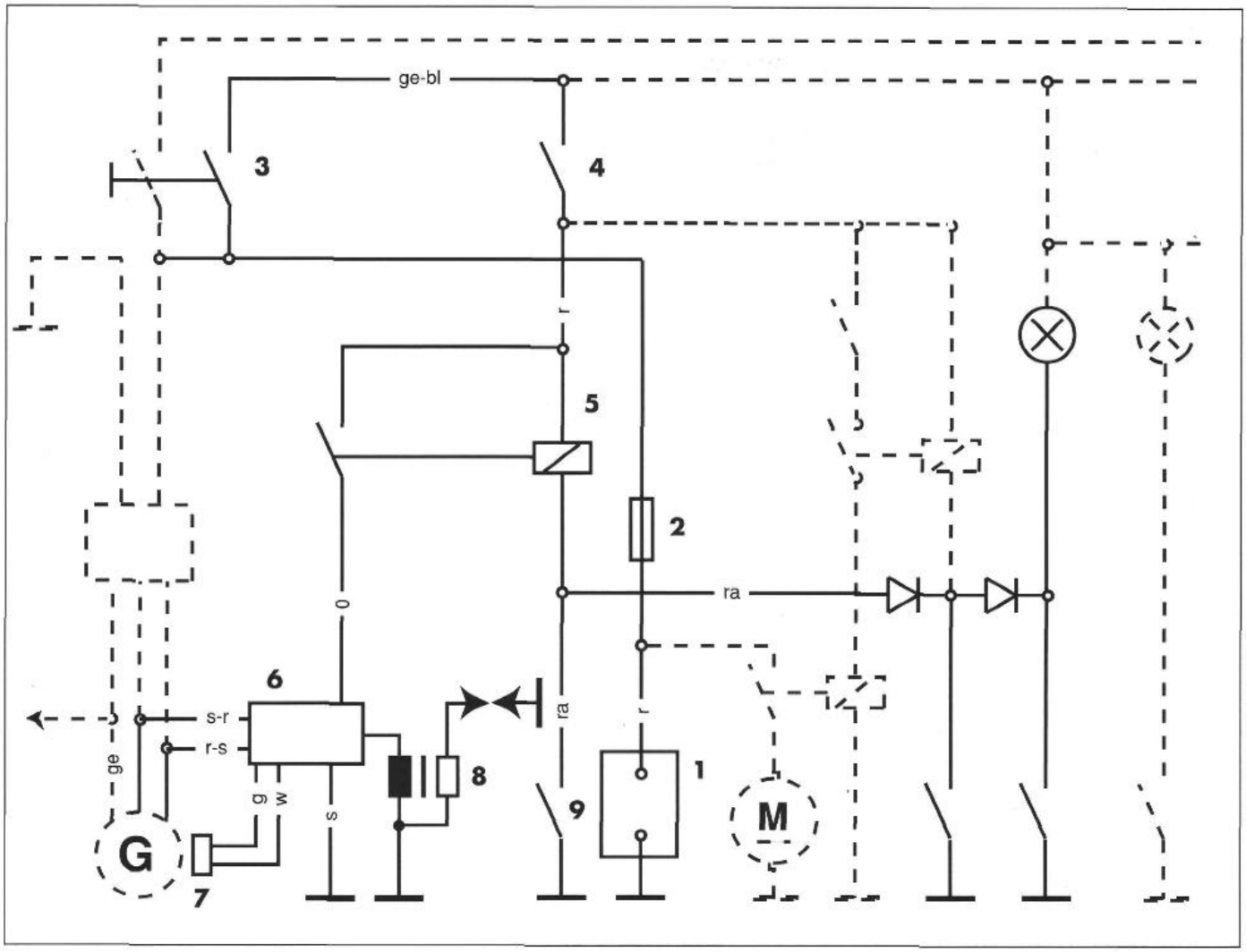
– Remove the chain cover.
– Connect one terminal of a test lamp to the positive pole of the battery and the other to connection ❹ of the neutral switch.
– The test lamp must light up when the transmission is switched to neutral.
– The test lamp must go out as soon as a gear is put in.

6.2.9 Trouble shooting in the electric starter system

When the starter motor fails to turn upon operation of the tip switch, perform the following checks first:

- Is the ignition lock switched to ON?
- Is the emergency OFF switch in the RUN position?
- Is the neutral control lamp on while the ignition is on?
- Can the engine be started with the clutch pulled?
- Is the battery charged?
- Has the main fuse blown?

- Check the auxiliary starting relay
- Check the starter relay
- Check the starter motor



❶ Battery
❷ Main fuse
❸ Ignition lock
❹ Emergency-off switch
❺ Auxiliary relay
❻ CDI
❼ Pulse generator
❽ Ignition coil
❾ Side stand switch

bl .....blue
br .....brown
ge .....yellow
gr .....grey
g .....green
o .....orange
r .....red
ra .....pink
s .....black
v .....violet
w .....white

6.3 Ignition system

From the battery ❶ the battery voltage is conducted via the main fuse ❷ through the ignition lock ❸ and the emergency OFF switch ❹, which are both ON, to the side stand relay ❺.
The side stand relay conducts the battery voltage to the CDI unit ❻, if at least one of the following requirements is met:

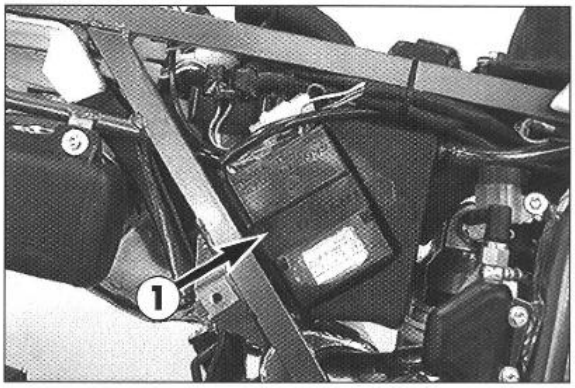
- The side stand is up (side stand switch closed).
- The transmission is switched to neutral (neutral switch closed).
- The clutch is pulled (clutch switch closed).

The pulse generator ❼ transmits a signal to the CDI unit ❻ upon every rotation of the crankshaft. In the CDI unit, the ignition point is computed from this signal. The ignition pulse is transmitted to the ignition coil ❽ (i.e. an ignition spark is generated).

NOTE: IN MODELS WITHOUT SIDE STAND THE SOCKET CONNECTORS OF THE SIDE STAND SWITCH (BELOW THE TANK) ARE CONNECTED WITH EACH OTHER.
THE IGNITION SYSTEM IS A DIGITAL HIGH VOLTAGE CAPACITOR IGNITION THAT RECEIVES ITS POWER SUPPLY FROM THE BATTERY. THEREFORE, IT WORKS ONLY WITH AN INTACT BATTERY. WHEN THE BATTERY IS DISCHARGED BELOW THE THRESHOLD LEVEL, THE VOLTAGE CAN, DUE TO THE STARTING PROCESS, DROP BELOW THE MINIMUM SUPPLY VOLTAGE REQUIRED BY THE IGNITION. IN THIS CASE, PLEASE USE THE KICKSTARTER TO START THE MOTORCYCLE.

! CAUTION !

SAFE AND FAULTLESS OPERATION OF THE DIGITAL IGNITION REQUIRES SPARK PLUG CONNECTORS AND SPARK PLUGS WITH INTEGRATED RESISTANCE TYPE SUPPRESSORS.

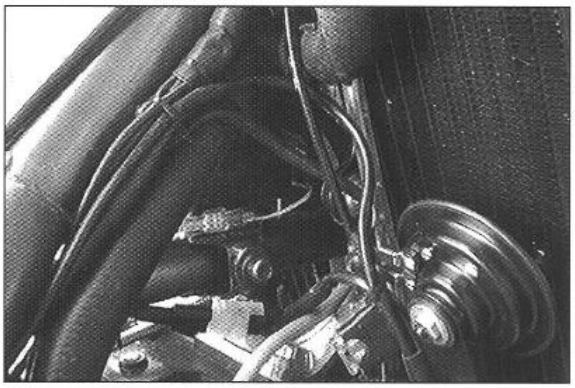


6.3.1 CDI unit

Check the cables and plug and socket connections of the CDI unit ❶.
The CDI unit function can only be checked on an ignition test bench.

! CAUTION !

NEVER USE A COMMERCIAL MEASURING DEVICE TO CHECK THE CDI UNIT. COMMERCIAL MEASURING DEVICES CAN DESTROY HIGHLY SENSITIVE ELECTRONIC COMPONENTS.



6.3.2 Check ignition coil

- Disconnect all cables and remove the spark plug connector.
- Use an ohmmeter to measure the following values.

NOTE: THE INDICATED SETPOINT VALUES CORRESPOND TO A TEMPERATURE OF 20° C.

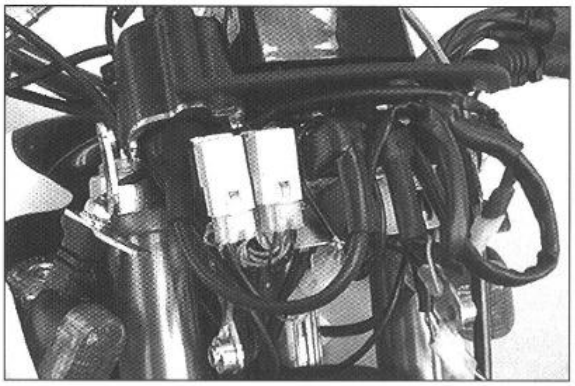
MEASUREMENT	COLOURS	RESISTANCE
primary coil	blue/white – ground	0,425 – 0,575 Ω
secondary coil	blue/white – ignition wire	10,8 – 16,2 kΩ

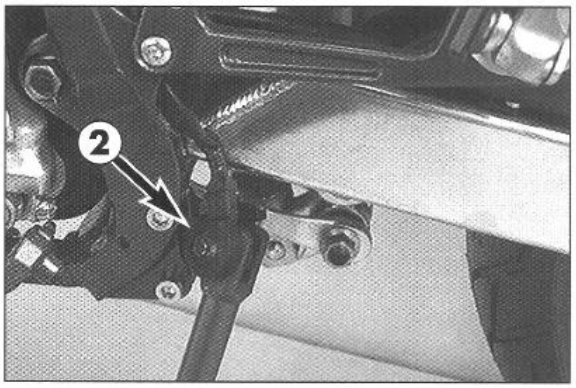
Replace the ignition coil if the measured values deviate significantly from the set-point values.

6.3.3 Spark plug connector

- Check the spark plug connector for cracks and fissures.
- Measure spark plug connector resistance.

SETPOINT VALUE: 3.0 – 7.5 kΩ



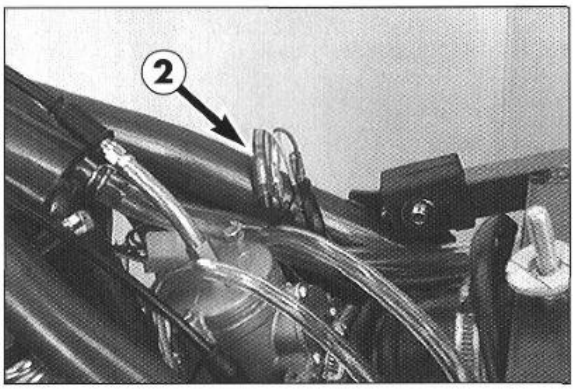


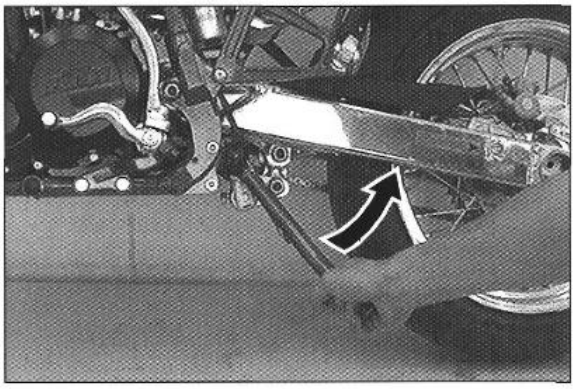
6.3.4 Checking the side stand relay

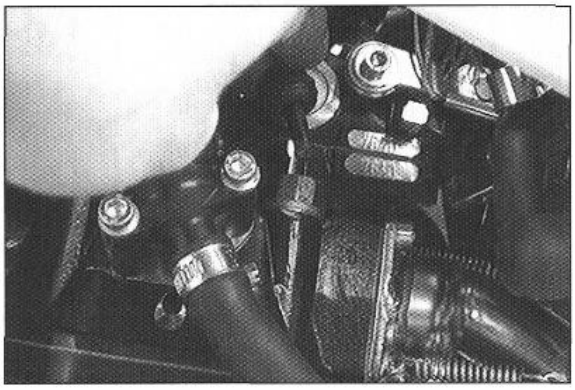
Preparation:
- Remove the seat, the right side cover and the headlight mask.
- Disconnect the power supply from the CDI (orange cable).
- To check the current status of the relay connect the orange cable coming from the cable tree either to the positive line of a voltmeter or to a test lamp.
- The negative line of the voltmeter or test lamp is connected to ground.
- Switch on the ignition lock and the emergency OFF switch.

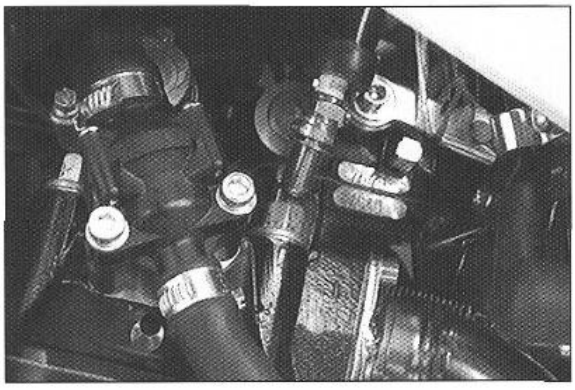
Perform the following tests in the order indicated below:
- The relay must connect in either of the following three cases:
- Put a gear in but do not pull the clutch. Slowly swing up the side stand. When the side stand is approximately halfway up, the side stand relay should respond. If this is not the case, please check the relay, the side stand switch ❷ as well as the corresponding parts of the cable tree.
- With the side stand down and a gear put in, slowly pull the clutch lever. The side stand relay should respond when the lever is pulled approximately half of the overall distance. If this is not the case, please check the diode in the connector with the yellow and the pink cable and the neutral switch.
- With the side stand down and the clutch not pulled, switch the transmission to neutral. The relay should connect when the transmission is switched to neutral and be tripped when a gear is put in. If this is not the case, please check the diode in the connector with the yellow and the green/black cable and the neutral switch.

NOTE: RESPONDING OF THE RELAY IS ACCOMPANIED BY A FAINT CLICKING SOUND AND THE CDIÍS POWER SUPPLY IS SWITCHED ON. THE VOLTMETER OR THE TEST LAMP INDICATES A BATTERY VOLTAGE. AFTER TESTING, RECONNECT THE CDI UNIT'S POWER SUPPLY (ORANGE CABLE).









6.3.5 Checking the side stand switch

- Disconnect the 2 connectors connecting the side stand switch ❷ with the cable tree (below the tank).
- Connect an ohmmeter to the side stand cable.
- Slowly swing up the side stand.
- The switch must be open while the side stand is down.
- The side stand switch must connect when the side stand is approximately half-way up.
- If this is not the case, replace the side stand switch.

! CAUTION !

NEVER SHORT-CIRCUIT THE SIDE STAND SWITCH SO AS TO BE ABLE TO DRIVE ON. THIS WOULD DEACTIVATE THE IGNITION CUT-OFF WITH THE SIDE STAND DOWN, AND YOUR MOTORCYCLE WOULD NO LONGER COMPLY WITH THE APPLICABLE SAFETY STANDARDS.

NOTE: IF THE SIDE STAND IS REMOVED, FOR EXAMPLE WHEN SUBSEQUENTLY INSTALLING A CENTER STAND, THE TWO CONNECTORS OF THE CABLE TREE THAT LEAD TO THE SIDE STAND SWITCH MUST ALSO BE CONNECTED.

6.3.6 Trouble shooting in the ignition system

Before checking the ignition system check

- if the ignition lock is in the ON position
- if the emergency OFF switch is in the RUN position
- if the neutral control lamp is on
- if the motorcycle can be started with the clutch pulled
- if the battery is charged
- the main fuse

Check if an ignition spark is produced when the starter is operated. Proceed as follows:

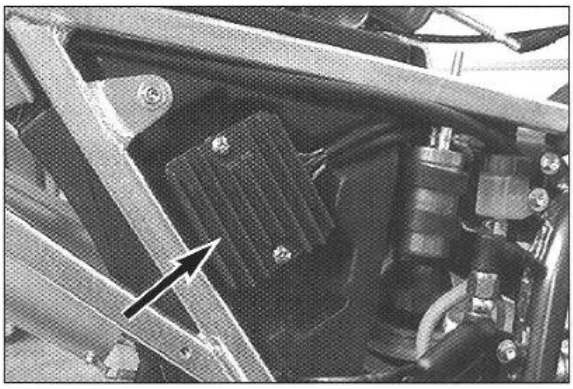
- Pull the spark plug connector.
- Disconnect the spark plug connector from the ignition cable.
- Hold the free end of the ignition cable approximately 5 mm from ground.
- A strong spark should be visible when the electric starter is now operated. If the battery is discharged below the threshold level required for electric starting, please use the kickstarter.

- If a spark is visible, replace the spark plug connector.
- Twist out the spark plug and insert it into the spark plug connector.
- Connect the spark plug to ground. A strong spark should be visible at the electrode when the electric starter is now operated. If this is not the case, the spark plug connector or the spark plug is defect.

- If no spark is produced during the first test, perform the following checks:
- Does the ignitionís power supply line (orange) carry battery voltage?
- If this is not the case, check the ignition lock, the emergency OFF switch and, if applicable, the side stand relay as well as the corresponding parts of the cable tree.

- If the ignition is sufficiently supplied with power and no spark is produced, check:
- ground connection of CDI unit and ignition coil
- the cable between CDI unit and ignition coil
- pulse generator
- stator
- ignition coil

NOTE: THE CDI UNIT CAN'T BE TESTED WITH SIMPLE DEVICES. IT CAN ONLY BE REPLACED.

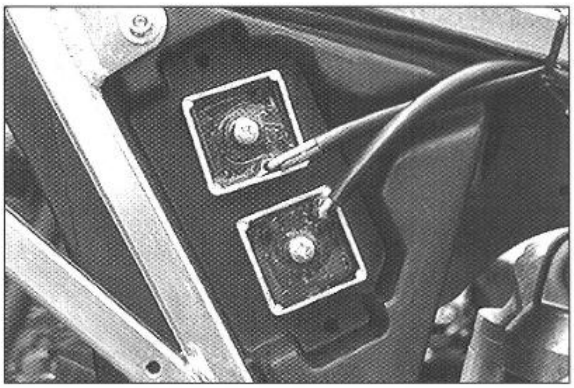


6.4 Checking the voltage regulator-rectifier (Shindengen)

- Start the engine and switch on the low beam.
- Connect a voltmeter to the two terminals of the capacitor (red/white cable = positive, brown cable = negative).
- Accelerate the engine to a speed of 5000 r.p.m. and read off the voltage.

NOMINAL VALUE: 14.0 - 15.0 V

If the reading significantly deviates from the nominal value above, check the capacitor. If the capacitor is intact, replace the voltage regulator-rectifier.



6.4.1 Checking the voltage regulator (Tympanium)

The two voltage regulators are located under the right side cover at the air filter box.

The voltage regulators are connected downstream of the switches. One of the voltage regulators regulates only the brake light circuit, the other regulates the circuit for the head light, the tail light, the speedometer illumination and the horn.

A defect voltage regulator can cause different kinds of trouble:

- NO VOLTAGE IN THE CIRCUIT

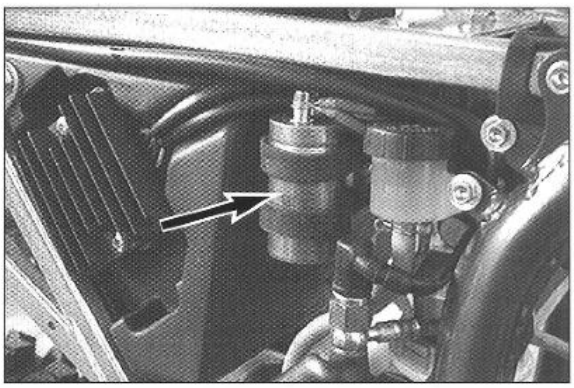
In this case, the voltage regulator must be disconnected at idle speed. The voltage regulator is defect if the power consumers now work properly.
If the power consumers are still not supplied with power, the switch, the wiring harness or the ignition system must be checked for defects.

- EXCESSIVE VOLTAGE IN THE CIRCUIT

The bulbs burn out.
Connect a voltmeter (yellow cable = positive, brown cable = negative) to check the voltage. Start the engine and switch on the power consumers.

At an engine speed of 3000 r.p.m, the voltage regulator must supply a voltage of 12.0 - 14.0 V A.C. At higher engine speeds, the limit of 14 V should not be exceeded either.

If the reading significantly deviates from the nominal value, replace the voltage regulator.

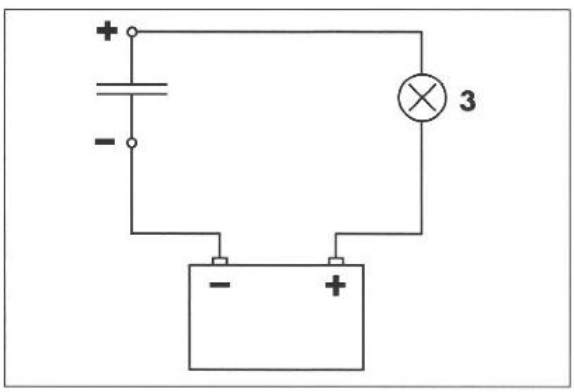


6.4.2 Checking the capacitor

- Discharge the capacitor 1 by bridging the two terminals with a screwdriver and remove.
- Connect the negative pole of a 12V battery with the negative terminal of the capacitor. The connection between the positive pole of the battery and the positive terminal of the capacitor (marked +) is made with a test lamp ❸.
- When the power circuit is closed, the test lamp must begin to light up. As capacitor charging increases, the brightness of the test lamp must decrease.
- The test lamp must go out after 0,5-2 seconds (depending on the lamp capacity).
- If the test lamp does not go out or does not light up at all, the capacitor is faulty.

! CAUTION !

DISCHARGE THE CAPACITOR BEFORE AND AFTER EACH TEST.
WHEN INSTALLING THE CAPACITOR, MAKE SURE THAT THE TERMINALS ARE CONNECTED IN ACCORDANCE WITH THEIR MARKINGS. CONNECT RED/WHITE CABLE TO + TERMINAL.



7.0 Trouble shooting

7.1 TROUBLE SHOOTING SX, SC, EGS

If you let the specified maintenance work on your motorcycle be carried out, disturbances can hardly be expected. Should an error occur nevertheless, we advise you to use the trouble shooting chart in order to find the cause of error.

TROUBLE	CAUSE	REMEDY
Engine will not start	Operating error	Switch on ignition, switch on emergency OFF switch, open fuel tap, tank fuel, do not use choke i.e. the hotstart device. Pay attention to starting off information (see driving instructions).
	Fuel supply interrupted	Close fuel tap, loosen fuel hose at carburettor, lead into a basin and open fuel tap, – if fuel leaks out, clean carburettor – if no fuel leaks out, check tank ventilation, i.e. clean fuel tap
	Flooded engine	See driving instructions
	Sooty or wet spark plug	Clean or replace spark plug
	Electrode gap too large	Adjust spark plug elektrode gap to 0,6 mm
	Spark plug connector or spark plug faulty	Dismount spark plug, connect ignition cable, hold to ground (blank place on engine) and actuate kickstarter, a strong spark must be produced at the spark plug – If no spark is produced, loosen spark plug cap from ignition cable, hold about 5 mm from ground and actuate kickstarter – If a spark now occurs, replace spark plug cap – If no spark is produced, control ignition system
	If connector oxidates from generator to ignition coil	Remove fuel tank, clean connector and treat with contact spray
	Short circuit cable scored in wiring harness, ignition lock, emergency OFF switch or short circuit button faulty	Remove fuel tank, draw off blue/black cable from orange cable of ignition coil and check spark. – If a spark is produced, seek fault in short circuit current
	Water in short emergency OFF switch	Remove 2-pole connector located underneath the headlight mask, treat emergency OFF switch with contact spray
	Water in carburettor or jets blocked	Dismount and clean carburettor
	Carburettor does not fit in properly at intake flange	Check if carburettor is fitted in correctly
Engine will not idle	Idling jet blocked	Dismount carburettor and clean jets
	Adjusting screws on carburettor uncorrect adjusted	Adjust carburettor
	Ignition system faulty	Have ignition system checked
Engine does not rev high	Carburettor fuel level too high because float needle valve is dirty or worn out	Dismount carburettor and check if worn out
	Loose carburettor jets	Tighten jets
	Electronical ignition timing faulty	Have ignition system checked

TROUBLE	CAUSE	REMEDY
Engine will not reach full power	Fuel supply partically interrupted or carburettor dirty	Clean and check fuel system as well as carburettor
	float is not tight, or no axial play	replace or abrade the float
	Air filter very dirty	Clean or replace air filter
	Exhaust leaking or blocked	Check if exhaust is damaged, replace glas fibre yarn in exhaust silencer
	Valve gap to small	Adjust valve gap
	Loss of compression because hand decompressor has no play	Check setting of the hand decompression cable
	Electronical ignition timing faulty	Have ignition system checked
Engine stops or splutters in carburettor	Insuffient fuel	Clean and check fuel system and carburettor
	Engine takes air out of control	Check intake flange and carburettor if firmly setted
Engine gets to hot, cooling liquid tmperature warning lamp lights up	Insufficient cooling liquid	Refill cooling liquid (see maintenace work), check cooling system for leaks
	Not enough air stream (SX, SC)	Drive on briskly
	Defect of cooling fan, fuse of cooling fan, or thermostatic switch (EGS)	Check fuse, bypass thermostatic switch, check coolant level
	Radiators very dirty	Clean radiators with water jet
	Foam formation in cooling system	Replace cooling liquid, use anti freeze liquid with brand name
	Bent cooling hose	Shorten or replace cooling hose
	Thermostat defective	Dismount and check thermostat (opening temperature 70°C, 158°F / SX 55° C) or replace it
High oil consumption	Buckling gearing ventilation hose	Dislocate i.e. replace non-buckling vetilation hose
	Engine oil level too high	Check engine oil level when the engine is warm; correct if necessary
	Motor oil too thin (viscosity)	Use thicker engine oil; see chapter „Engine oil"
All switched on lamps blown out	Capacitor or voltage regulator faulty	Remove right side cover and control connections. Have capacitor and voltage regulator checked
Parking light does not shine (only models with battery)	Fuse melted	Remove seat and replace fuse

7.2 TROUBLE SHOOTING EGS-E, R/XC e, LSE, DUKE e

If you let the specified maintenance work on your motorcycle be carried out, disturbances can hardly be expected. Should an error occur nevertheless, we advise you to use the trouble shooting chart in order to find the cause of error.

TROUBLE	CAUSE	REMEDY
Engine doesn't crank.	Operating errror	Turn on the ignition, switch the gear to neutral and switch the emergency OFF switch on, swing up side stand.
	Discharged battery.	Recharge the battery and investigate the causes for discharging; contact a KTM dealer.
	Defect ignition lock or emergency OFF switch	Check ignition lock and emergency OFF switch, contact a KTM dealer.
Engine doesn't crank; neutral indicator lamp and headlight don't light up.	Blown main fuse	Remove seat and replace the main fuse. If fuse blows again contact a KTM dealer
	Discharged battery.	Charge battery as indicated in the manual and determine cause of discharge. Contact a KTM dealer.
The engine cranks only with pulled clutch lever	The diode at the connector support is defect (interrupted)	Contact a KTM dealer; the diode must be replaced.
Engine cranks with gear engaged.	Defect safe-starting system.	Contact a KTM dealer.
Engine cranks but doesn't start.	Operating error	Open fuel tap, tank fuel, you did not use choke i.e. the warmstart device. Pay attention to starting off information (see driving instructions).
	Fuel supply interrupted	Loosen fuel hose at carburettor, lead into a basin and open fuel tap – if fuel leaks out, the carburetor might need cleaning – if no fuel leaks out, check tank ventilation, i.e. clean fuel tap
	Flooded engine	See driving instructions
	Sooty or wet spark plug	Clean or replace spark plug
	Electrode gap too large	Adjust spark plug elektrode gap to 0,7 mm
	Spark plug connector or spark plug faulty	Dismount spark plug, connect ignition cable, hold to ground (blank place on engine) and actuate starter, a strong spark must be produced at the spark plug – If no spark is produced, loosen spark plug cap from ignition cable, hold about 5 mm from ground and actuate kickstarter – If a spark now occurs, replace spark plug cap – If no spark is produced, control ignition system
	The plug connection of the CDI-unit, the pulse generator or the ignition coil has oxydized	Remove the seat, the right side cover and the fuel tank. Clean the plug connection and treat it with contact spray
	Water in carburetor or jets blocked	Dismount and clean carburetor
	Carburetor does not fit in properly at intake flange	Check if carburetor is fitted in correctly
Engine fails to idle	Glogged idling jet	Disassemble carburetor and clean jets
	Oncorrect adjustment of adjusting screws on carburetor	Have carburetor adjusted
	Defective ignition system	Have ignition system checked

TROUBLE	CAUSE	REMEDY
Engine does not rev high	Carburetor fuel level too high because – Float needle is dirty or worn out – Float leaks – Float has no axial play	Dismount carburetor and check if worn out Replace float needle Replace float Abrade float
	Loose carburettor jets	Tighten jets
	Electronic ignition timing faulty	Have ignition system checked
Engine will not reach full power	Fuel supply partically interrupted or carburetor dirty	Clean and check fuel system as well as carburetor
	Float leaks, or no axial play	Replace or abrade the float
	Air filter very dirty	Clean or replace air filter, contact a KTM dealer
	Exhaust system leaking or deformed	Check if exhaust system is damaged
	Valve clearance to small	Have valve clearance adjusted
	Loss of compression because hand decompressor has no play	Check setting of the hand decompression cable
	Electronic ignition timing faulty	Have ignition system checked
Engine misfires or backfires into carburetor	Fuel shortage	Clean and check fuel system and carburettor
	Engine takes in unmetered air	Check intake flange and carburettor for tight fit
Engine overheats	Insufficient cooling liquid	Refill cooling liquid (see maintenace work), check cooling system for leaks
	Radiator fins are extremely dirty	Clean radiator with water jet
	Foam forms in cooling system	Replace cooling liquid, use antifreezer with brand name
	Bent radiator hose	Shorten or replace cooling hose
	Thermostat defective	Remove and check thermostat (opening temperature 70°C (158°F) or replace it, contact a KTM dealer
	Blown fan fuse	Replace fuse and check if fan operates properly (see below)
	Defect thermoswitch	Contact a KTM dealer
	Fan defective	Check if fan operates properly. To do this, start the engine, then bypass the connections to the thermoswitch (bottom right radiator), contact a KTM dealer
High oil consumption	Buckling gear ventilation hose	Readjust or replace ventilation hose
	Engine oil level too high	Check engine oil level when the engine is warm; correct if necessary
	Engine oil too thin (viscosity)	Use thicker engine oil; see chapter „Engine oil"
All switched on lamps blown out	Voltage regulator faulty	Remove seat and check connections. Have voltage regulator checked
The NEUTRAL lamp is not on even though the gear is in NEUTRAL	Defect indicator lamp.	Replace indicator lamp
	Defect neutral switch.	Connect cable to ground; neutral switch must be replaced if indicator lamp lights up.
	Loose connections, defect cable.	Check connections and cables.
The battery is discharged	The ignition (power consumer) hasn't been switched off	Recharge the battery according to the relevant instructions.
	The battery isn't charged by the generator because	Remove seat and check voltage regulator connections; voltage regulator and generator should be checked by a KTM dealer.

8.0 Technical data / maintenance schedule

8.1 TECHNICAL SPECIFICATIONS – ENGINE 400/620 LC4 '97

Engine	400 LC4	620 LC4
Design	Liquid-cooled single cylinder 4-stroke engine with balancer shaft	
Displacement	398 cm³	609 cm³
Bore / Stroke	89 / 64 mm	101 / 76 mm
Ratio	10.8 : 1	SX: 11.5 : 1 SC, EGS: 10.4 : 1
Fuel	unleaded premium gasoline with a least RON 95	
Valve timing	4 valves over rocker arm and 1 overhead camshaft, camshaft drive through single chain	
Camshaft	249° (249)	
Valve timing by 1 mm valve clearence	IO 22° BTDC EO 59° BBDC IC 47° ABDC EC 10° ATDC	IO 14° BTDC EO 56° BBDC IC 55° ABDC EC 13° ATDC
Valve diameter	Intake: 36 mm Exhaust: 30 mm	
Valve clearence cold	Intake: 0.20 mm Exhaust: 0.20 mm	SX: Intake: 0.20 mm Exhaust: 0.20 mm SC, EGS: Intake: 0.15 mm Exhaust: 0.15 mm
Crank shaft bearing	2 cylinder roller bearing	
Connecting rod bearing	needle bearing	
Top end bearing	bronze bushing	
Piston	forged/cast aluminium alloy	
Piston rings	1 compression ring, 1 taper face ring, 1 oil scraper ring	
Engine lubrication	forced-feed lubrication through Eaton-Oilpump with oil sump	
Engine oil	see bellow #	
Engine oil quantity	SX, SC: 1,6 liters / EGS: 2.1 liters including frame	
Primary ratio	straight geared spur wheels 30 : 81 teeth	
Clutch	multi disc clutch in oil bath	
Transmission	5-speed claw shifted	
Gear ratio	1st 14:35 2nd 15:24 3rd 18:21 4th 20:19 5th 22:18	
Ignition system	contactless thyristor ignition with electronic advanced system type SEM	
Ignition timing	adjustment to max. 38 ° BTDC at 6000 rpm	SX: adjustment to max. 38 ° BTDC at 6000 rpm SC, EGS: adjustment to max. 32 ° BTDC at 6000 rpm
Generator	12V 130W	
Spark plug	NGK D8EA	
Spark plug gap	0.,6 mm	
Cooling system	liquid cooled, permanent rotation of cooling liquid through mechanic driven water pump	
Cooling liquid	1 liter, 40% antifreeze, 60% water, at least –25 ° C (–13 ° F)	
Starting equipment	decompressor automatic and hand actuated, cold and hot start knob on carburetor	

8.1.1 TOLERANCE, ASSEMBLY CLEARANCE

Crank shaft	axial play	0.03 - 0.12 mm	(0.001-0.005 in)
	run out of crank stud	max. 0.04 mm	(0.0016 in)
Connecting rod bearing	radial play	max. 0.05 mm	(0.0019 in)
	axial play	max. 1.00 mm	(0.04 in)
Piston	assembly clearance 400/620	max. 0.12 mm	(0.005 in)
Piston rings end gap	compression rings	max. 0.60 mm	(0.023 in)
	oil scraper ring	max. 0.80 mm	(0.031 in)
Valves	seat sealing intake	max. 1.50 mm	0.059 in)
	seat sealing exhaust	max. 2.00 mm	(0.079 in)
	run out of valve heads	max. 0.03 mm	(0.001 in)
	valve guides diameter	max. 7.05 mm	(0.277 in)
Oil pump	clearance outer rotor - housing	max. 0.20 mm	(0.008 in)
	clearance outer rotor - inner rotor	max. 0.20 mm	(0.008 in)
Bypaß valve	minimum spring lenght	25 mm	(1 in)
Clutch discs	wear limit organic	2.5 mm	(0.1 in)
Transmission shafts	axial play	0.1 - 0.4 mm	(0.004 in)
Clutch	minimum clutchspring lenght	34.5 mm (new 37 mm)	(1.36 in - new 1.45 in)

8.1.2 TIGHTENING TORQUES - ENGINE

Hexagon nut at primary gear	M20x1.5	Loctite 242 + 170 Nm	(125 ft.lb)
Collar nut flywheel	M12x1 LH thread	60 Nm	(44 ft.lb)
Hexagon nut for inner clutch hub	M18x1.5	Loctite 648 + 80 Nm	(59 ft.lb)
Kickstarter stop screw	M12x1.5	70 Nm	(52 ft.lb)
AH screws oil pump	M6	Loctite 242 + 8 Nm	(6 ft.lb)
Hexagon screw camshaft gear	M10	35 Nm	(26 ft.lb)
AH screw cylinder head top sect.	M6x25	8 Nm	(6 ft.lb)
AH screw cylinder head top sect.	M6x50/M6x55 (12.9)	20 Nm	(15 ft.lb)
AH screw cylinder head top sect.	M6x65/M6x70 (8.8)	8 Nm	(6 ft.lb)
Cylinder head screws	M10	50 Nm	(37 ft.lb)
Collar nuts at cylinder base	M10	40 Nm	(30 ft.lb)
Hexagon screw chain sprocket	M10	Loctite 242 + 40 Nm	(30 ft.lb)
Oil drain plug	M22x1.5	30 Nm	(22 ft.lb)
Magnetic plug	M12x1.5	20 Nm	(15 ft.lb)
Plug bypass valve	M12x1.5	20 Nm	(15 ft.lb)
Banjo bolts oil lines	M8x1	10 Nm	(7 ft.lb)
Banjo bolt oil lines	M10x1	15 Nm	(11 ft.lb)
Jet screw clutch cover	M8x1	10 Nm	(7 ft.lb)
Spark plug	M12x1.25	20 Nm	(15 ft.lb.)
Screw plug timing-chain tensioner	M12x1.5	20 Nm	(15 ft.lb)
Counternuts valve adjusting screws	M7x0.75	20 Nm	(15 ft.lb)

8.1.3 BASIC CARBURETOR SETTING

	400 SC (20 kW)	400 SC	400 EGS Classic	620 SC (20 kW)	620 SX 620 SC	620 EGS Classic without secondary air system	620 EGS Classic with secondary air system
Carburetor	PHM 38 SD	PHM 38 SD	PHM 38 SD	PHM 40 SD	PHM 40 SD	PHM 40 SD	PHM 40 SD
Carburetor setting number	300896	4894/6	300896	110996	4922	4922/2	110996
Main jet	150	190	150	155	195	170	155
Needle jet	DR 266	DR 270	DR 266	DR 268	DR 272	DR 268	DR 268
Idling jet	45	45	45	45	45	45	45
Jet needle	K 51	K 51	K 51	K 51	K 51	K 51	K 51
Needle position from top	3 rd	2 nd	3 rd	3 rd	2 nd	3 rd	3 rd
Mixture.adju. screw open	1.5 turn	1.5 turn	1.5 turn	1.5 turn	1.5 turn	1.5 turn	1.5 turn
Throttle valve	40	40	40	40	40	40	40
Starting jet	45	45	45	45	45	45	45
Performance restrictor	slide stop 22 mm	–	–	slide stop 26 mm	–	–	–

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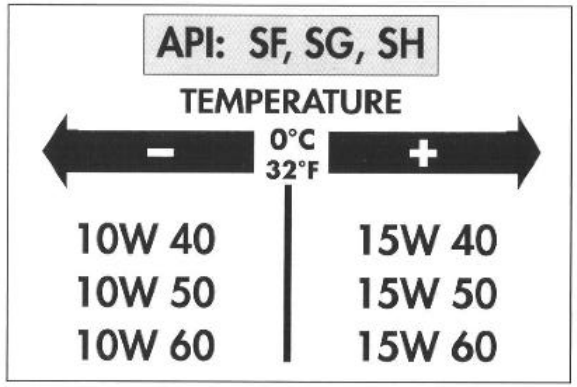

Engine oil

Use only oil brands, which meet quality requirements of API-classes SF, SG or SH (informations on bottles) or higher. Both, mineral and synthetic oils with above specifications can be used.

! CAUTION !

POOR OIL QUALITY OR MINOR QUANTITY EFFECT EARLY ENGINE-WEAR.

8.2 TECHNICAL DATA – ENGINE 400 / 620 LC4 e '97

Engine	400 LC4-E	620 LC4-E
Design	Liquid-cooled single cylinder 4-stroke engine with balancer shaft and electric starter	
Displacement	398 cm³	609 cm³
Bore / Stroke	89 / 64 mm	101 / 76 mm
Ratio	10,8 : 1	10,4 : 1
Fuel	unleaded premium gasoline with a least RON 95	
Valve timing	4 valves over rocker arm and 1 overhead camshaft, camshaft drive through single chain	
Camshaft	249° (249)	
Valve timing by 1 mm valve clearence	IO 22° BTDC EO 59° BBDC IC 47° ABDC EC 10° ATDC	IO 14° BTDC EO 56° BBDC IC 55° ABDC EC 13° ATDC
Valve diameter	Intake: 36 mm Exhaust: 30 mm	
Valve clearence cold	Intake: 0,20 mm Exhaust: 0,20 mm	0,15 mm Exhaust: 0,15 mm
Crank shaft bearing	2 cylinder roller bearing	
Connecting rod bearing	needle bearing	
Top end bearing	bronze bushing	
Piston	forged/cast aluminium alloy	
Piston rings	1 compression ring, 1 taper face ring, 1 oil scraper ring	
Engine lubrication	two Eaton-oilpumps	
Engine oil	see bellow #	
Engine oil quantity	appr. 2,1 liters including frame	
Primary ratio	straight geared spur wheels 30 : 81 teeth	
Clutch	multi disc clutch in oil bath	
Transmission	5-speed claw shifted	
Gear ratio	1st 14:35 2nd 15:24 3rd 18:21 4th 20:19 5th 22:18	
Ignition system	contactless DC-CDI ignition with digital advanced system type KOKUSAN	
Ignition timing	adjustment to max. 38° BTDC at 6000 rpm	
Generator	12V 200W	
Spark plug	NGK DR8EA	
Spark plug gap	0,7 mm	
Cooling system	liquid cooled, permanent rotation of cooling liquid through mechanic driven water pump	
Cooling liquid	1 liter, 40% antifreeze, 60% water, at least –25 ° C (–13 ° F)	
Starting equipment	electric starter and kickstarter	

8.2.1 TOLERANCE, ASSEMBLY CLEARANCE

Crank shaft	axial play	0.03 - 0.12 mm (0.0012 - 0.0047 in)
	run out of crank stud	max. 0.04 mm (0.0016 in)
Connecting rod bearing	radial play	max. 0.05 mm (0.002 in)
	axial play	max. 1.10 mm (0.043 in)
Cylinder 400	bore diameter	max. 89.04 mm (3.5055 in)
Cylinder 620	bore diameter	max. 101.04 mm (3.9779 in)
Piston	assembly clearance	max. 0.12 mm (0.0047 in)
Piston rings end gap	compression rings	max. 0.80 mm (0.0315 in)
	oil scraper ring	max. 1.0 mm (0.0394 in)
Valves	seat sealing intake	max. 1.50 mm (0.0591 in)
	seat sealing exhaust	max. 2.00 mm (0.0788 in)
	run out of valve heads	max. 0.03 mm (0.0012 in)
	valve guides diameter	max. 7.05 mm (0.2778 in)
Oil pump	clearance outer rotor - housing	max. 0.20 mm (0.0079 in)
	clearance outer rotor - inner rotor	max. 0.20 mm (0.0079 in)
Bypaß valve	minimum spring lenght	25 mm (0.985 in)
Clutch	clutchspring lenght	min. 34.5 mm (1.36 in). new 37 mm (1.458 in)
	Clutch disks organic	min. 2.5 mm (0.0985 in)
Cam shaft	pin bearing diameter	min. 19.97 mm (0.7868 in)
Transmission shafts	axial play	0.1 – 0.4 mm (0.0039 – 0.0158 in)

8.2.2 TIGHTENING TORQUES - ENGINE

Hexagon nut at primary gear	M20x1.5	Loctite 242 + 170 Nm (125 ft.lb)
Hexagon nut flywheel	M16x1.25 LH thread	150 Nm (110 ft.lb)
Hexagon nut for inner clutch hub	M18x1.5	Loctite 648 + 80 Nm (59 ft.lb)
Kickstarter stop screw	M12x1.5	50 Nm (37 ft.lb)
Allen head screws oil pump	M6	Loctite 242 + 8 Nm (6 ft.lb)
Hexagon screw camshaft gear	M10	35 Nm (26 ft.lb)
Allen head screws outer race	M6x12/M6x12,5	Loctite 648 + 18 Nm (13 ft.lb)
Allen head screw cylinder head top sect.	M6x50/M6x55 (12.9)	20 Nm (15 ft.lb)
Allen head screw cylinder head top sect.	M6x25/M6x65/M6x70 (8.8)	8 Nm (6 ft.lb)
Cylinder head screws	M10	50 Nm (37 ft.lb)
Collar nuts at cylinder base	M10	40 Nm (30 ft.lb)
Hexagon screw chain sprocket	M10	Loctite 242 + 40 Nm (30 ft.lb)
Oil drain plug	M22x1.5	30 Nm (22 ft.lb)
Magnetic plug	M12x1.5	20 Nm (15 ft.lb)
Plug bypass valve	M12x1.5	20 Nm (15 ft.lb)
Crankshaft locating bolt	M8	25 Nm (18 ft.lb)
Hollow screws oil lines	M8x1	10 Nm (7 ft.lb)
Hollow screws oil lines	M10x1	15 Nm (11 ft.lb)
Jet screw clutch cover	M8	10 Nm (7 ft.lb)
Screw plug timing-chain tensioner	M12x1.5	20 Nm (15 ft.lb)
Spark plug	M12x1.25	20 Nm (15 ft.lb)
Counternuts valve adjusting screws	M7x0.75	20 Nm (15 ft.lb)
Engine fastening screw	M8	40 Nm (30 ft.lb)
	M10	70 Nm (52 ft.lb)

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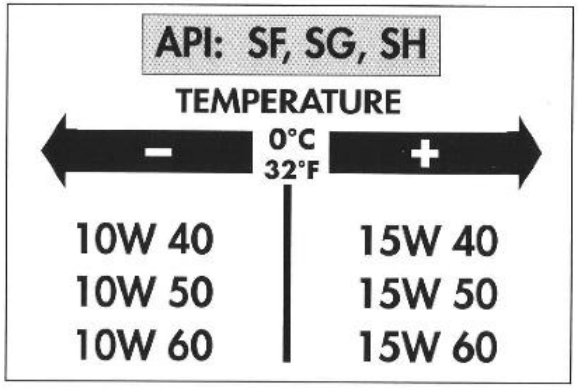


Engine oil

Use only oil brands, which meet quality requirements of API-classes SF, SG or SH (informations on bottles) or higher. Both, mineral and synthetic oils with above specifications can be used.

! CAUTION !

POOR OIL QUALITY OR MINOR QUANTITY EFFECT EARLY ENGINE-WEAR.

8.2.3 BASIC CARBURETOR SETTING

	400 EGS-E 400 LSE 25 kW with and without KAT	400 EGS-E 400 LSE 31 kW with and without KAT	620 EGS-E 620 LSE 25 kW without KAT	620 EGS-E 620 LSE 37 kW without KAT	620 EGS-E 620 LSE 25 kW with KAT	620 EGS-E 620 LSE 37 kW with KAT	DUKE 620 e
Carburetor	PHM 38 ND	PHM 38 ND	PHM 40 SD	PHM 40 SD	PHM 40 SD	PHM 40 SD	PHM 40 SD
Carburetor setting number	100197	100197	090197	090197	080197	080197	080197
Main jet	130	130	155	155	155	155	155
Needle jet	AR 265	AR 265	DR 270	DR 270	DR 268	DR 268	DR 268
Idling jet	50	50	45	45	45	45	45
Jet needle	K 23	K 23	K 51	K 51	K 51	K 51	K 51
Needle position from top	2 nd	2 nd	3 rd	3 rd	3 rd	3 rd	3 rd
Mixture.adju. screw open	1,5 turn	1,5 turn	1,5 turn	1,5 turn	1,5 turn	1,5 turn	1,5 turn
Throttle valve	50/1	50/1	40	40	50	50	50
Starting jet	45 (50, 55)	45 (50, 55)	45 (50, 55)	45 (50, 55)	45 (50, 55)	45 (50, 55)	45 (50, 55)
Performance restrictor	slide stop 51 mm	–	slide stop 28 mm	–	slide stop 28 mm	–	–

8.3 PERIODIC MAINTENANCE SCHEDULE

5.97

KTM MOTORCYCLES SX / SC / EGS

IF THE MOTORCYCLE IS USED FOR COMPETITIVE RACING, THE 5000 KM (3000 MILES) SERVICE NEEDS TO BE CARRIED OUT AFTER EVERY RACE

	KTM rider		KTM dealer			
	before each start	after washing	1st service, after 1000 km (600 miles) or 10 hours	after 2500 km (1500 miles) or 25 hours	after 5000 km (3000 miles) or once a year	at least once a year
Check engine oil level	●					
Change engine oil (SX, SC)			●	●		●
Change engine oil (EGS)			●		●	●
Clean oil screen and magnet of the drain plugs whenever you exchange the engine oil			●			
Change oil filter unit			●		●	●
Change microfilter (SX, SC)				●		●
Change fine screen filter (screwed filter) at the frame tube			●		●	●
Check oil lines for leakage and proper instalment			●		●	
Check valve clearance			●		●	
Clean spark plug and adjust electrode gap					●	
Change spark plug after 10 000 kilometers (6 200 miles)						
Check valve clearance					●	
Drain and clean carburator float bowl		●			●	●
Adjust idling					●	
Check breather hoses of engine gase and gas tank for correct position without buckles			●		●	
Clean air filter and air filter box		●			●	●
Check sprockets, chain guides and chain for wear	●		●		●	
Maintaining chain tension eccentrics (Duke)						●
Clean and lube chain	●	●			●	
Check chain tension	●		●		●	
Check cooling liquid level	●		●		●	
Check quality of antifreeze						●
Check cooling system for leaks	●		●		●	
Check exhaust system for leakage						●
Change exhaust muffler packing (aluminium-muffler)				●	●	
Check exhaust brackets			●		●	
Disassemble and clean spark arrestor discs (USA models)						
Check brake fluid level front and rear	●		●		●	
Change brake fluid						●
Check brake pad thickness	●				●	
Check brake discs					●	
Check condition and correct instalment of brake hoses	●		●		●	
Check freeplay and easy operation of hand brake lever and foot brake lever	●		●		●	
Check adjustment and function of fork	●				●	
Check fork for leaks					●	
Loosen breather screws at fork legs (overpressure)					●	
Change fork oil						●
Perform a full maintenance job for the telescopic fork						●
Clean dust scrabber on forks					●	●
Check steering head bearing clearance / adjust			●		●	
Clean and grease steering head bearings and its seals						●
Check adjustment and funktion of shock absorber	●				●	
Check O-ring of the shock absorber for wear					●	●
Servicing the shock absorber						●
Grease lubricating nipple of the Pro Lever suspension system					●	
Disassemble the Pro Lever suspension system and perform a full maintenance job on it						●
Servicing swingarm pivots						●
Check tightness of spokes and rim join	●		●		●	
Check wheel bearings for clearance	●				●	
Check chock absorber rubbers on the rear wheel hub					●	
Check tire condition and air pressure	●				●	
Check cables for damage and easy working	●				●	
Lube and adjust cables		●	●		●	
Check the electrical system	●		●		●	
Check battery holder and connections (Duke)					●	●
Check adjustment of head light					●	
Spray ignition lock, emergency OFF switch, short circuit button, and light switch with contact spray		●			●	
Check all screws, nuts and hose clamps for proper tightness	●		●		●	
Grease or lube all pivot points and sliding components		●	●		●	

8.4 PERIODIC MAINTENANCE SCHEDULE

5.97

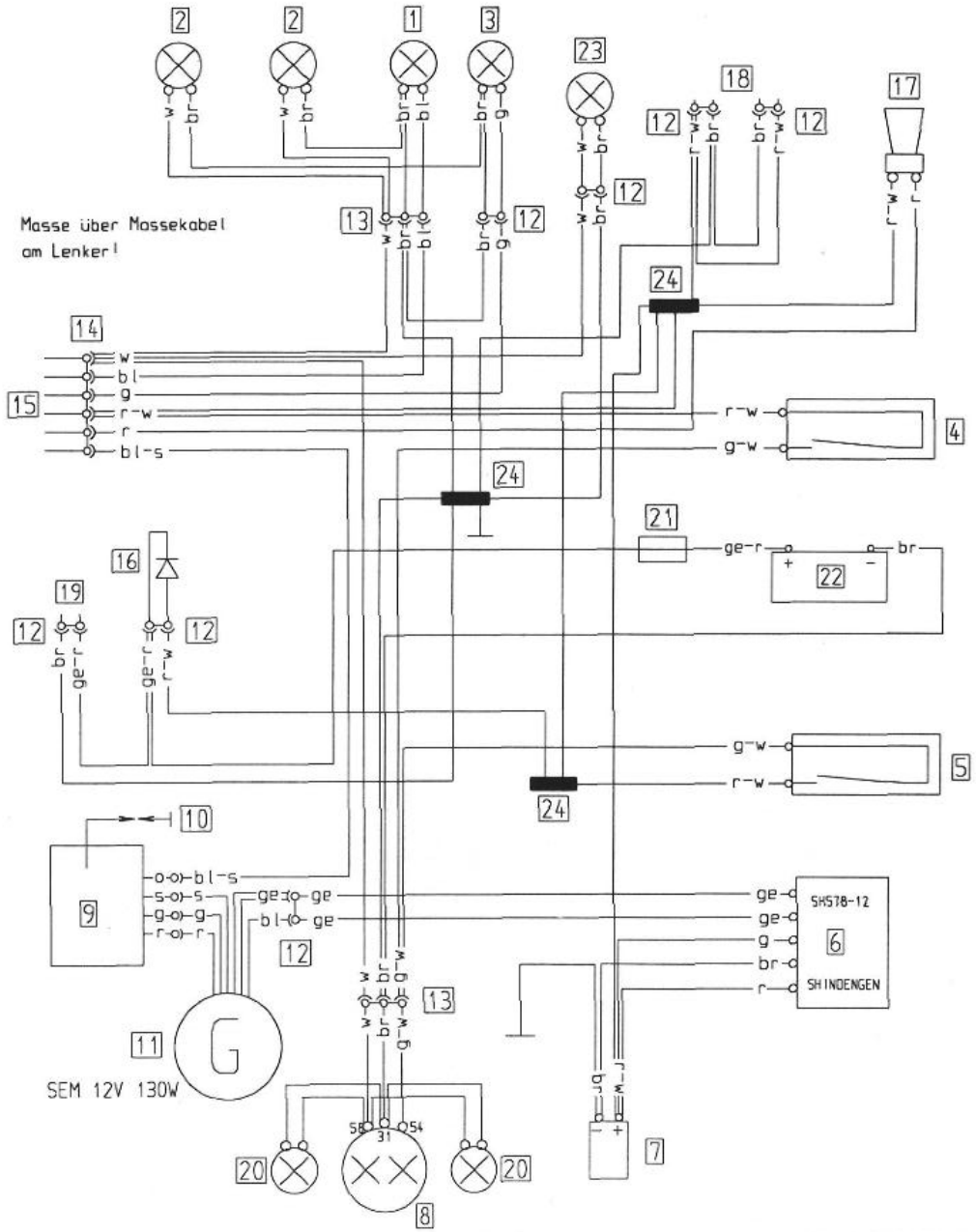
EGS-E / R/XC e / LSE / DUKE e

IF THE MOTORCYCLE IS USED FOR COMPETITIVE RACING, THE 5000 KM (3000 MILES) SERVICE NEEDS TO BE CARRIED OUT AFTER EVERY RACE

	KTM rider		KTM dealer			
	before each start	after washing	1st service, after 500 km (300 miles)	after 2500 km (1500 miles)	after 5000 km (3000 miles) or once a year	at least once a year
Check engine oil level	●					
Change engine oil			●		●	●
Clean oil screen and magnet of the drain plugs whenever you exchange the engine oil			●			
Change oil filter insert			●		●	●
Change fine screen filter (screwed filter) at front pipe (of the frame)			●		●	●
Check oil lines for leakage and proper instalment without kinks			●		●	
Check valve clearance			●		●	
Clean spark plug and adjust electrode gap					●	
Change spark plug after 10 000 kilometers (6 200 miles)						
Check ignition point					●	
Drain and clean carburetor float chamber		●			●	●
Adjust idling					●	
Check breather hoses of engine gase and gas tank for correct position without buckles			●		●	
Clean air filter and air filter box		●			●	●
Check sprockets, chain guides and chain for wear	●		●		●	
Maintain chain tension eccentrics (Duke)						●
Clean and lube chain	●	●			●	
Check chain tension	●		●		●	
Check cooling liquid level	●		●		●	
Check quality of antifreezer						●
Check cooling system for leaks – visual check	●		●		●	
Check exhaust system for leakage						●
Check exhaust brackets			●		●	
Disassemble and clean spark arrestor discs (USA models)						
Check brake fluid level front and rear	●		●		●	
Change brake fluid						●
Check brake pad thickness	●				●	
Check brake discs					●	
Check condition and correct instalment of brake hoses	●		●		●	
Check free play and easy operation of foot brake pedal	●		●		●	
Check adjustment and function of telescopic fork	●				●	
Check telescopic fork for leaks					●	
Loosen bleeder screws at fork legs (overpressure)					●	
Change telescopic fork oil						●
Perform a full maintenance job for the telescopic fork						●
Clean dust scrabber of telescopic fork					●	●
Check steering head bearing clearance / adjust			●		●	
Clean and grease steering head bearings and its seals						●
Check adjustment and funktion of shock absorber	●				●	
Check O-ring of the shock absorber for wear (only White Power shock absorber)					●	●
Service the shock absorber						●
Grease nipple of the Pro Lever suspension system					●	
Disassemble the Pro Lever suspension system linkage and perform a full maintenance job on it						●
Service swingarm pivot						●
Check spoke tension and join	●		●		●	
Check wheel bearings for clearance	●				●	
Check shock absorber rubbers on the rear hub					●	
Check tire condition and air pressure	●				●	
Check cables for damage and easy working	●				●	
Lube and adjust cables		●	●		●	
Check the electrical system	●		●		●	
Check battery holder, battery and connections					●	●
Check adjustment of headlight					●	
Spray ignition lock, emergency off switch, and light switch with contact spray		●			●	
Check all screws, nuts and hose clamps for proper tightness	●		●		●	
Grease or lube all pivot points and sliding points		●	●		●	

9.0 Schaltpläne
9.0 Wiring diagramms
9.0 Schemi elettrico
9.0 Schémas de cablage

KTM SERVICE	Modell: Rallye LC4 '97	Kabelstrangnummer: 585 11 075 000	Land: ----	Datum, Name: 25.11.96 KE	Zeichnungsnr.: 46R7-RAL	Änderungsstand:	Kabelstrangbez.: Rally 4-Takt 97



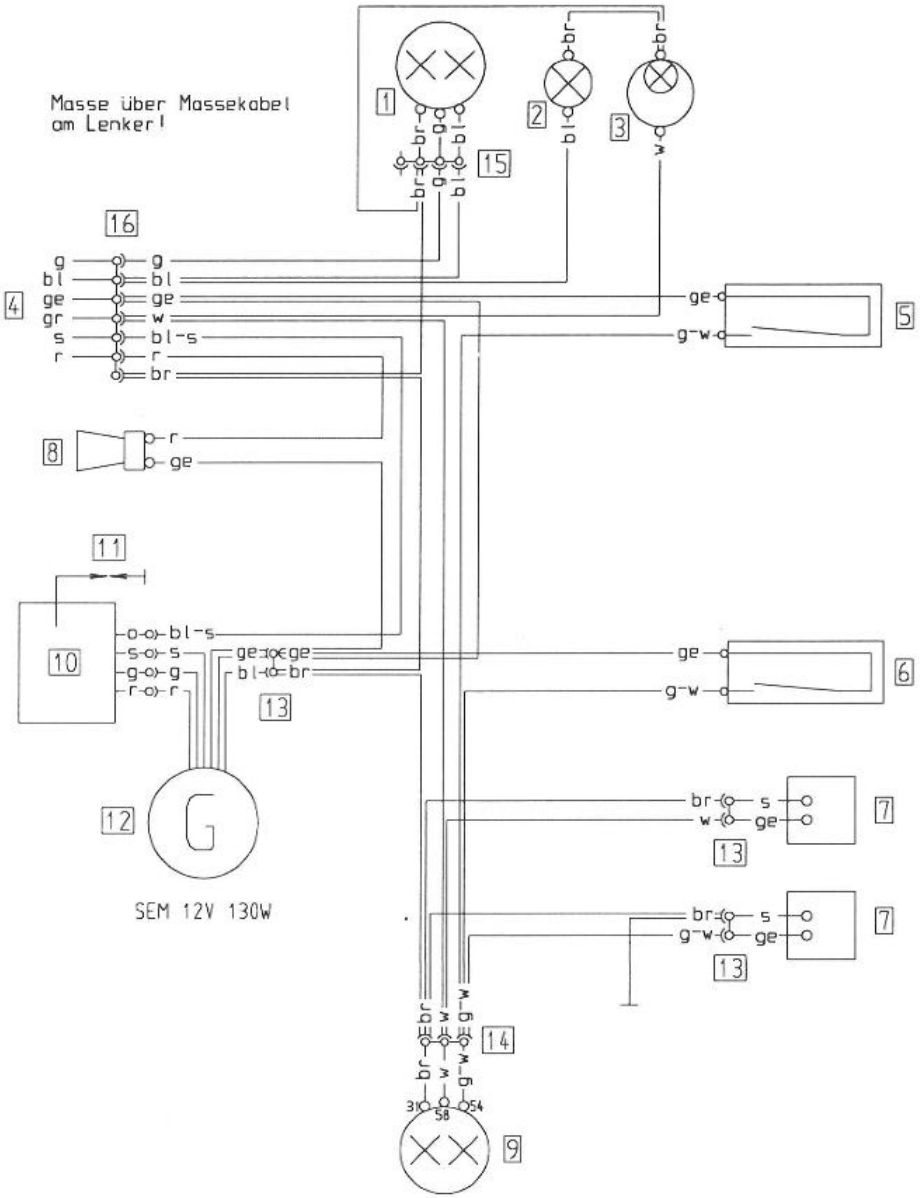
Deutsch	Englisch	Italienisch	Französisch
1 Fernlicht	1 headlight	1 faro	1 phare
2 Standlicht	2 parking light	2 luce di posizione	2 feu de position
3 Abblendlicht	3 low beam	3 anabbaglianti	3 feu de croisement
4 Bremslichtsch. vo	4 stoplight switch f.	4 int.luce arresto ant.	4 cont.de stop av.
5 Bremslichtsch. hi	5 stoplight switch r.	5 int.luce arresto post	5 cont de stop der.
6 Spannungsregler	6 voltage regulator	6 regol. di tens.	6 regulat.de potent.
7 Kondesator	7 capacitor	7 condensatore	7 condensateur
8 Brems-Schlußlicht	8 rear-stoplight	8 fanal.post.di freno	8 feu arr.et de stop
9 Zündspule	9 ignition coil	9 bobina d'accens.	9 bobine d'allumage
10 Zündkerze	10 spark plug	10 candela	10 bougie
11 Generator	11 generator	11 dinamo	11 generateur
12 2-pol.Stecker	12 multip.cont.plug (2)	12 connettore a 2 poli	12 connect.multiple (2)
13 3-pol.Stecker	13 multip.cont.plug (3)	13 connettore a 3 poli	13 connect.multiple (3)
14 9-pol.Stecker	14 multip.cont.plug (9)	14 connettore a 9 poli	14 connect.multiple (9)
15 zum Kombischalter	15 to combinat. switch	15 multicomando	15 vers commutateur
16 Diode	16 diode	16 diodo	16 diode
17 Horn	17 horn	17 clacson	17 klaxon
18 Roadbookversorgung	18 roadbook-energy	18 roadbook-energia	18 roadbook-energie
19 GPS-Versorgung	19 GPS-energy	19 GPS-energia	19 GPS-energie
20 Zusatzrücklicht	20 complem. rear light	20 luce di supplement	20 feu de supplement
21 Sicherung 10A	21 fuse 10A	21 fusibile 10A	21 fusible 10A
22 Batterie 12V 1,2Ah	22 battery 12V 1,2Ah	22 batteria 12V 1,2Ah	22 batterie 12V 1,2 Ah
23 Roadbookbeleuchtung	23 roadbook light	23 luce di roadbook	23 feu di roadbook
24 Parallelverbinder	24 parallel connector	24 parallelo composto	24 parallele connecteur
bl blau	bl blue	bl blu	bl bleu
br braun	br brown	br marrone	br brun
ge gelb	ge yellow	ge giallo	ge jaune
g grün	g green	g verde	g vert
o orange	o orange	o arancione	o orange
r rot	r red	r rosso	r rouge
s schwarz	s black	s nero	s noir
w weiß	w white	w bianco	w blanc

Hauptkabelstrang Nr.: 585.11.075.000
Kabelstrang hinten Nr.: 585.11.076.000
Regler Nr.: 585.11.034.000
Zusatzrücklichtstrang Nr.: 585.11.099.100

Kontaktbelegung –
Kombischalter (Typ CEV 9607)

	g	bl	ge	gr	s	r	⊥
LICHT •							
Abblendl.	•		•	•			
Fernlicht		•	•	•			
HUPE						•	•
ZÜNDUNG AUS					•		•
	5	2	1	3	6	4	

KTM SERVICE	Modell: 400/620 Super Competition '97 (Wettbewerbsversion)	Kabelstrangnummer: vorne 583 11 275 100 hinten 583 11 276 000	Land: USA, DIV.	Datum, Name: 10.03.96 KE	Zeichnungsnr.: 23 46C7---W	Änderungsstand:	Kabelstrangbez.: 4T E-XC 93



Deutsch	Englisch	Italienisch	Französisch
1 Scheinwerfer	1 headlight	1 faro	1 phare
2 Fernlichtkontrolle	2 high beam control	2 spia abbagliante	2 temoin feu route
3 Tachobeleuchtung	3 tachometer light	3 luce di tachimetro	3 eclair.comp.vitesse
4 zum Kombischalter	4 to combinat. switch	4 multicomando	4 commodo
5 Bremslichtsch. vo	5 stoplight switch f.	5 int.luce arresto ant.	5 contact.de stop av.
6 Bremslichtsch. hi	6 stoplight switch r.	6 int.luce arresto post	6 contact.de stop arr.
7 Spannungsbegrenzer	7 voltage limiter	7 regol. di tens.	7 regulateur
8 Schnarre	8 horn	8 clacson	8 klaxon
9 Brems-Schlußlicht	9 rear-stoplight	9 fanal.post.di freno	9 feu arr.et de stop
10 Zündspule	10 ignition coil	10 bobina d'accens.	10 bobine d'allumage
11 Zündkerze	11 spark plug	11 candela	11 bougie
12 Generator	12 generator	12 dinamo	12 generateur
13 2-pol.Stecker	13 multip.cont.plug (2)	13 connettore a 2 poli	13 connect.multiple (2)
14 3-pol.Stecker	14 multip.cont.plug (3)	14 connettore a 3 poli	14 connect.multiple (3)
15 4-pol.Stecker	15 multip.cont.plug (4)	15 connettore a 4 poli	15 connect.multiple (4)
16 9-pol.Stecker	16 multip.cont.plug (9)	16 connettore a 9 poli	16 connect.multiple (9)
bl blau	bl blue	bl blu	bl bleu
br braun	br brown	br marrone	br brun
ge gelb	ge yellow	ge giallo	ge jaune
gr grau	gr grey	gr grigio	gr gris
g grün	g green	g verde	g vert
o orange	o orange	o arancione	o orange
r rot	r red	r rosso	r rouge
s schwarz	s black	s nero	s noir
v violett	v violet	v violetto	v violet
w weiß	w white	w bianco	w blanc

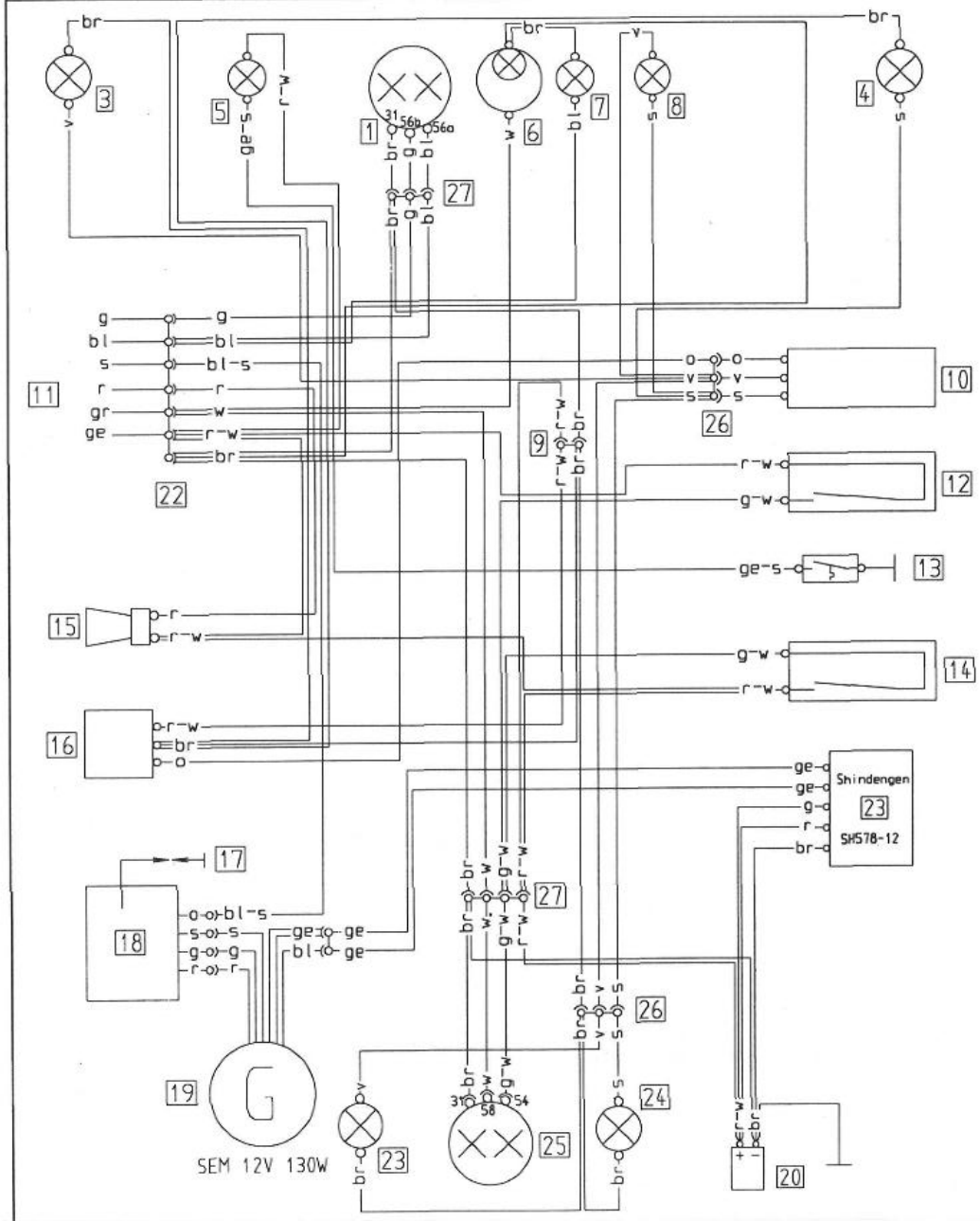
Kontaktbelegung – Kombischalter (Typ CEV 9607)

	g	bl	ge	gr	s	r	⊥
LICHT •							
Abblendl.	•		•	•			
Fernlicht		•	•	•			
HUPE						•	•
ZÜNDUNG AUS					•	•	
	5	2	1	3	6	4	

Spanisch
1 faro
2 lampara aviso luces largas
3 luz tacometro
4 interruptor combinado
5 interruptor luz de freno del
6 interr. luz de freno tras.
7 regulador de tension
8 claxon
9 luz de freno trasera
10 bobina de encendido
11 bujia
12 generador
13 conector multiple (2)
14 conector multiple (3)
15 conector multiple (4)
16 conector multiple (9)
bl azul
br marron
ge amarillo
gr gris
g verde
o naranja
r rojo
s negro
v violeta
w blanco

KTM SERVICE

Modell:	Kabelstrangnummer: Hauptkabelstrang:	Land:	Datum, Name:	Zeichnungsnr.:	Änderungsstand:	Kabelstrangbez.:
400/620 LC4 Super Competition '97	583.11.175.200	DIVERSE	16.10.95 KE	SUPCOM97		SUPCOM97



Deutsch	Englisch	Italienisch	Französisch
1 Scheinwerfer	1 headlight	1 faro	1 phare
2 Standlicht	2 parking light	2 luce di posizione	2 feu de position
3 Blinker li vo	3 blinker left front	3 lampegg. ant. sn.	3 clignoteur av.gauche
4 Blinker re vo	4 blinker right front	4 lampegg. ant. dx	4 clignoteur av.droite
5 Temperaturkontrolle	5 temperature control	5 controllo temperat.	5 temoin temperature
6 Tachobeleuchtung	6 tachometer light	6 luce di tachimetro	6 eclair.comp.vitesse
7 Fernlichtkontrolle	7 high beam control	7 spia abbagliante	7 temoin de feu route
8 Blinkerkontrolle	8 blink control	8 spia lampeggiatori	8 temoin de clignoteur
9 2-pol.Stecker	9 multip.cont.plug (2)	9 connettore a 2 poli	9 connect.multiple (2)
10 Blinkerschalter	10 indicator switch	10 int. lampeggiatori	10 bouton de clignotant
11 zum Kombischalter	11 to combinat. switch	11 multicomando	11 commutateur combine
12 Bremslichtsch. vo	12 stoplight switch f.	12 int.luce arresto ant	12 cont.de stop av.
13 Temp.-schalter	13 temperature switch	13 int. temperatura	13 sonde de temp.
14 Bremslichtsch. hi	14 stoplight switch r.	14 int.luce arresto pos	14 cont.de stop
15 Horn	15 horn	15 clacson	15 klaxon
16 Blinkgeber	16 blink signal system	16 trasmett. di lampeg.	16 centrale clignot.
17 Zündkerze	17 spark plug	17 candela	17 bougie
18 Zündspule	18 ignition coil	18 bobina d'accens.	18 bobine d'allumage
19 Generator	19 generator	19 dinamo	19 generateur
20 Kondensator	20 capacitor	20 condensatore	20 condensateur
21 Spannungsregler	21 voltage regulator	21 regol. di tens.	21 regulateur
22 9-pol.Stecker	22 multip.cont.plug (9)	22 connettore a 9 poli	22 connect.multiple (9)
23 Blinker li hi	23 blinker left rear	23 lampegg. post. sn.	23 clign.arr.gauche
24 Blinker re hi	24 blinker right rear	24 lampegg. post. dx.	24 clign.arr.droit
25 Brems-Schlußlicht	25 rear-stoplight	25 fanal.post.di freno	25 feu arr.et de stop
26 3-pol.Stecker	26 multip.cont.plug (3)	26 connettore a 3 poli	26 connect.multiple (3)
27 4-pol.Stecker	27 multip.cont.plug (4)	27 connettore a 4 poli	27 connect.multiple (4)
bl blau	bl blue	bl blu	bl bleu
br braun	br brown	br marrone	br brun
ge gelb	ge yellow	ge giallo	ge jaune
gr grau	gr grey	gr grigio	gr gris
g grün	g green	g verde	g vert
o orange	o orange	o arancione	o orange
r rot	r red	r rosso	r rouge
s schwarz	s black	s nero	s noir
v violett	v violet	v violetto	v violet
w weiß	w white	w bianco	w blanc

Spanisch
1 faro
2 luz de posicion
3 interm. izquierdo delant.
4 interm. derecho delantero
5 control temperatura
6 indicator punto muerto
7 lamp. aviso luces largos
8 lamp. aviso intermitentes
9 conector multiple (2)
10 interruptor intermitente
11 interruptor combinado
12 interr. luz de freno del.
13 interruptor temperatura
14 interr. luz de fren tras.
15 claxon
16 conjunto del intermintente
17 bujia
18 interruptor temperatura
19 generador
20 condensador
21 regulador de tension
22 conector multiple (9)
23 interm. izquirdo trasero
24 interm. derecho trasero
25 luz de freno trasero
26 conector multiple (3)
27 conector multiple (4)
bl azul
br marron
ge amarillo
gr gris
g verde
o naranja
r roja
s negro
v violeta
w blanco

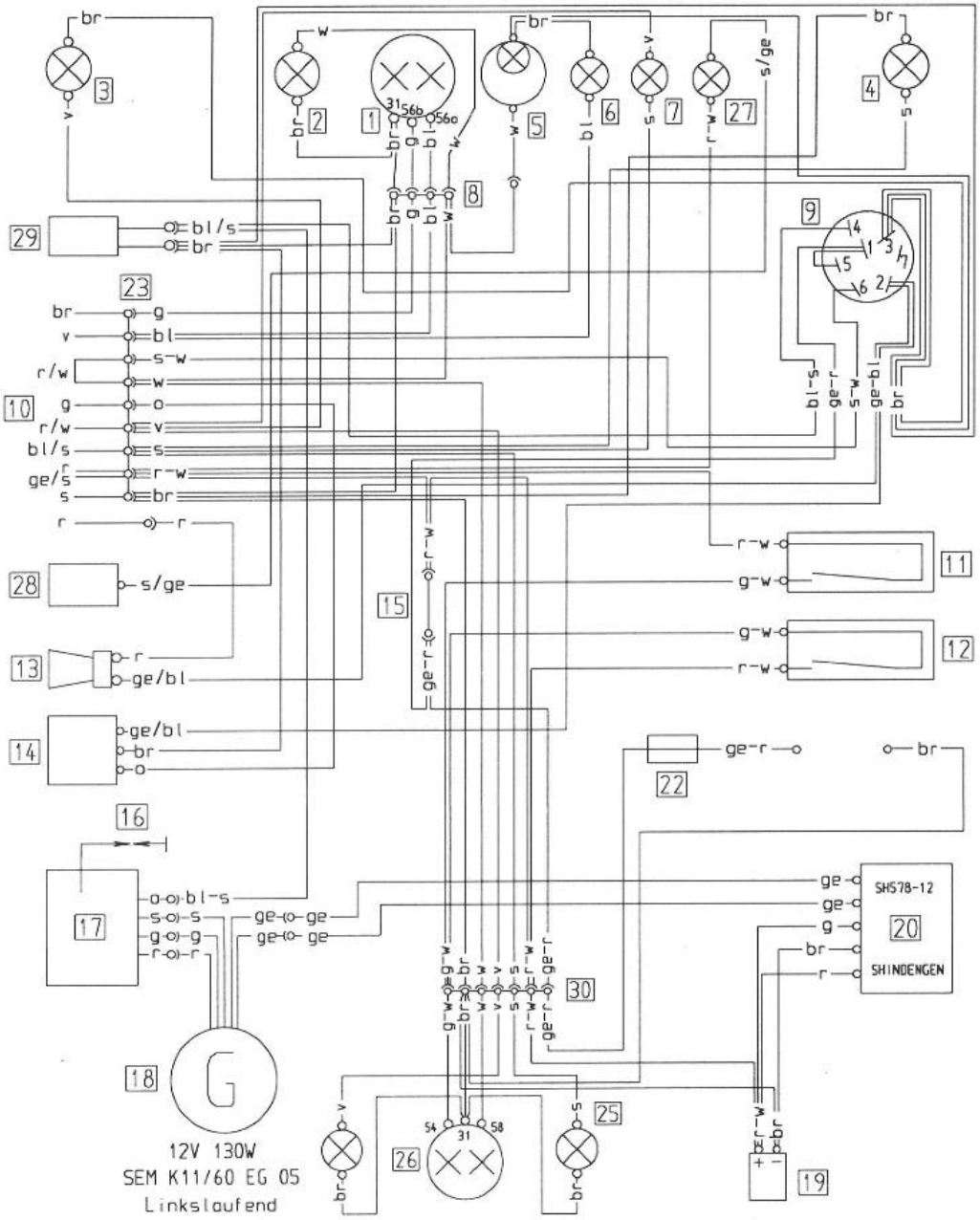
Kabelstrangbezeichnungen:

Hauptkabelstr: 583.11.175.200
CEV-Str. hi: 583.11.176.000
Blinkerstr vo: 583.11.177.100
Blinkerstr hi: 583.11.178.000
Blinkerschalterstr. CEV: 580.11.371.000

Kontaktbelegung -
Kombischalter (Typ CEV 9607)

	g	bl	ge	gr	s	r	⊥
LICHT ●							
Abblendl.	●		●	●			
Fernlicht		●	●	●			
HUPE						●	●
ZÜNDUNG AUS					●		●
	5	2	1	3	6	4	Lenkerarmatur

KTM SERVICE	Modell: 400/620 Super-Competition '97	Kabelstrangnummer: vorne: 583 11 475.400 hinten: 583 11 476 000	Land: AUSTRALIEN	Datum, Name: 03 10 96 KE	Zeichnungsnr.: 465708SA	Änderungsstand:	Kabelstrangbez.: vo:SC Austr. hi:4-T EGS



Deutsch	Englisch	Italienisch	Französisch
1 Scheinwerfer	1 headlight	1 faro	1 phare
2 Standlicht	2 parking light	2 luce di posizione	2 feu de position
3 Blinker li vo	3 blinker left front	3 lampegg. ant. sn.	3 clignoteur av.gauche
4 Blinker re vo	4 blinker right front	4 lampegg ant. dx.	4 clignoteur av.droit
5 Tachobeleuchtung	5 tachometer light	5 luce di tachimetro	5 eclair.comp.vitesse
6 Fernlichtkontrolle	6 high beam control	6 spia abbagliante	6 temoin feu route
7 Blinkerkontrolle	7 blink control	7 spia lampeggiatori	7 temoin de clignoteur
8 4-pol.Stecker	8 multip.cont plug (4)	8 connettore a 4 poli	8 connect.multiple (4)
9 Zündschloß	9 ignition switch	9 int. accensione	9 contact.d'allum
10 zum Kombischalter	10 to combinat. switch	10 multicomando	10 commodo
11 Bremslichtsch. vo	11 stoplight switch f.	11 int luce arresto ant	11 contact.de stop av
12 Bremslichtsch. hi	12 stoplight switch r.	12 int.luce arresto post	12 contact.de stop
13 Horn	13 horn	13 clacson	13 klaxon
14 Blinkgeber	14 blink signal system	14 trasmett. di lampeg.	14 centrale clignot
15 Kabelbrücke	15 wire connection	15 cablaggio	15 racord de cable
16 Zündkerze	16 spark plug	16 candela	16 bougie
17 Zündspule	17 ignition coil	17 bobina d'accens.	17 bobine d'allumage
18 Generator	18 generator	18 dinamo	18 generateur
19 Kondensator	19 capacitor	19 condensatore	19 condensateur
20 Spannungsregler	20 voltage regulator	20 regol. di tens.	20 regulateur
21 Batterie 1.2Ah	21 battery 1.2Ah	21 batteria 1.2Ah	21 batterie 1.2Ah
22 Stecksicherung 10A	22 fuse 10A	22 fusibile 10A	22 fusible 10A
23 9-pol.Stecker	23 multip.cont.plug (9)	23 connettore a 9 poli	23 connect.multiple (9)
24 Blinker li hi	24 blinker left rear	24 lampegg. post sn	24 clign.arr gauche
25 Blinker re hi	25 blinker right rear	25 lampegg post dx.	25 clign arr droit
26 Brems-Schlußlicht	26 rear-stoplight	26 fanal post di freno	26 feu arr et de stop
27 Temperaturkontrolle	27 temperature control	27 controllo temperatura	27 temoin de temperat.
28 Temperaturschalter	28 temperature switch	28 int. temperatura	28 contact de temp.
29 Not-Aus-Schalter	29 short circuit switch	29 int.arresto d'emerg.	29 bouton de masse
bl blau	bl blue	bl blu	bl bleu
br braun	br brown	br marrone	br brun
ge gelb	ge yellow	ge giallo	ge jaune
gr grau	gr grey	gr grigio	gr gris
g grün	g green	g verde	g vert
o orange	o orange	o arancione	o orange
r rot	r red	r rosso	r rouge
s schwarz	s black	s nero	s noir
v violett	v violet	v violetto	v violet
w weiß	w white	w bianco	w blanc

Kontaktbelegung Not-Aus-Schalter (Typ CEV 6302)

	s	bl
RUN		
OFF	●	

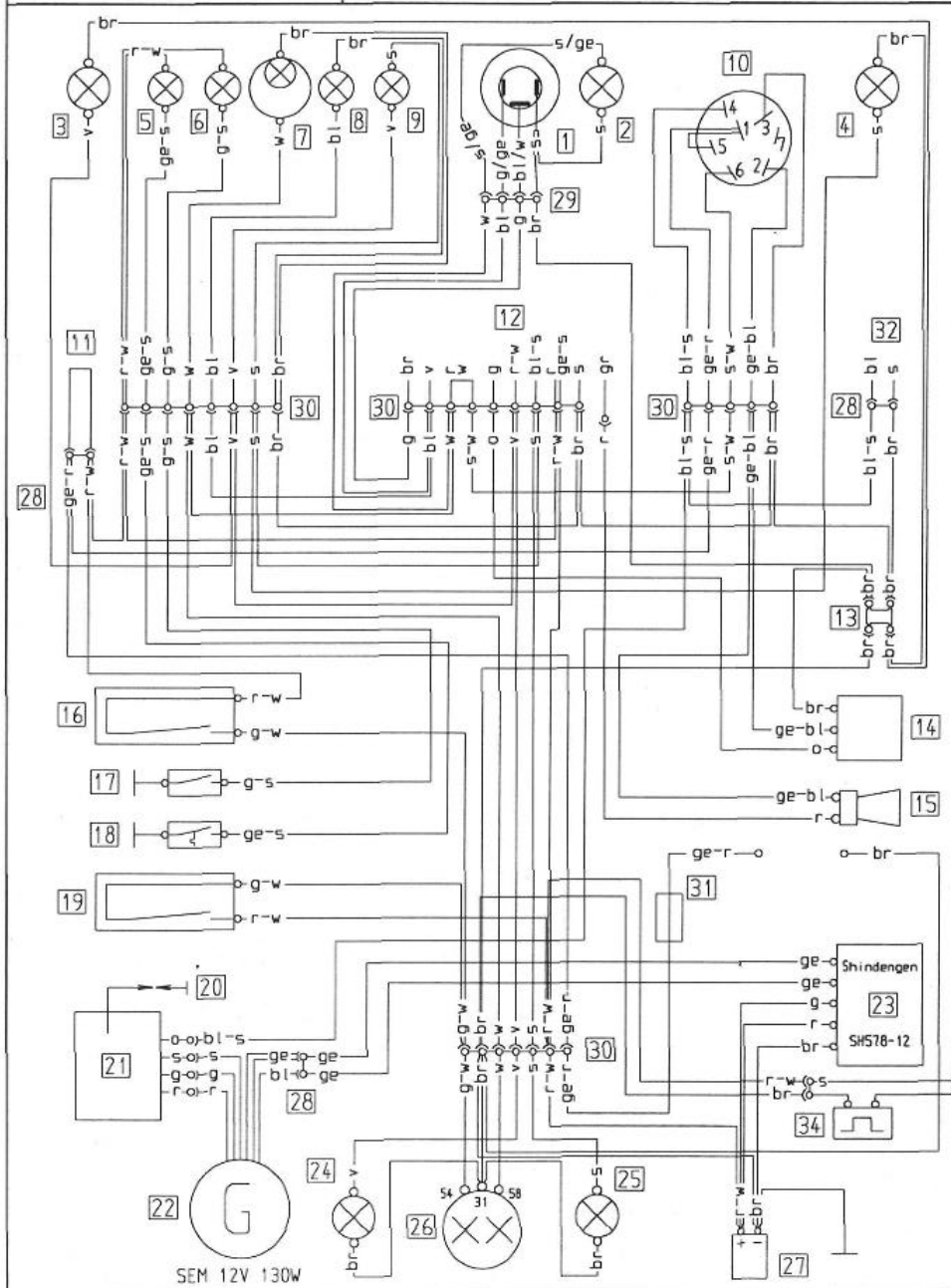
Kontaktbelegung Zündschloß (Typ CEV 7-pol.)

	1	2	3	4	5	6	7
PARK	●		●	●			
AUS			●	●			
EIN	●	●			●	●	
EIN	●	●			●	●	●

Kontaktbelegung - Kombischalter (Typ CEV 100826000)

	s	br	v	r-w	s-bl	g	gr	r/ge-s
TURN L				●	●			
TURN R					●			
LIGHTS ●								
H LO	●							●
H HI					●			●
HORN	●					●		
PASSING					●			●

KTM SERVICE	Modell: 400/620 LC4 EGS '97 (o.Batt.)	Kabelstrangnummer: vorne: 583.11.475.300 hinten: 583 11 476 000	Land: BRD, DIV,	Datum, Name: 16.10.95 EK	Zeichnungsnr.: 42 46570BS-	Änderungsstand	Kabelstrangbez.: vo: 4T E-GS 95 hi: CEV 358 m.Bl



Deutsch	Englisch	Italienisch	Französisch	Spanisch
1 Scheinwerfer	1 headlight	1 faro	1 phare	1 faro
2 Standlicht	2 parking light	2 luce di posizione	2 feu de position	2 luz de posicion
3 Blinker li vo	3 blinker left front	3 lampegg. ant. sn.	3 clignoteur av.gauche	3 interm.izquierdo delant
4 Blinker re vo	4 blinker right front	4 lampegg. ant. dx.	4 clignoteur av.droit	4 interm.derecho delantero
5 Temperaturkontrolle	5 temperature control	5 controllo temperat.	5 temoin d.temperature	5 control temperatura
6 Leerlaufanzeige	6 neutral	6 indicat.marcia folle	6 ind.de point mort	6 indicator punto muerto
7 Tachobeleuchtung	7 tachometer light	7 luce di tachimetro	7 eclair.comp vitesse	7 luz tacometro
8 Fernlichtkontrolle	8 high beam control	8 spia abbagliante	8 temoin de feu route	8 lamp.aviso luces largas
9 Blinkerkontrolle	9 blink control	9 spia lampeggiatori	9 temoin de clignoteur	9 lampara aviso intermit.
10 Zündschloß	10 ignition switch	10 int accensione	10 contact.d'allum.	10 llave de contacto
11 Kabelbrücke	11 wire connection	11 cablaggio	11 racord de cable	11 conector
12 zum Kombischalter	12 to combinat. switch	12 multicomando	12 commutateur	12 interruptor combinado
13 Masseanschluß	13 ground connection	13 collegam.a massa	13 masse	13 conector a masa
14 Blinkgeber	14 blink signal system	14 trasmett. di lampeg.	14 centrale clignot.	14 conjunto del intermit.
15 Horn	15 horn	15 clacson	15 klaxon	15 claxon
16 Bremslichtsch. vo	16 stoplight switch f.	16 int.luce arresto ant	16 cont.de stop av.	16 interr.luz de freno del.
17 Leerlaufschalter	17 neutral switch	17 interr luce folle	17 sonde de marche	17 interruptor punto muerto
18 Temp.-schalter	18 temperature switch	18 int. temperatura	18 arr.de temp.	18 interruptor temperatura
19 Bremslichtsch. hi	19 stoplight switch r.	19 int.luce arresto post	19 cont.de stop	19 interr.luz de freno tras
20 Zündkerze	20 spark plug	20 candela	20 bougie	20 bujia
21 Zündspule	21 ignition coil	21 bobina d'accens.	21 bobine d'allumage	21 bobina de encendido
22 Generator	22 generator	22 dinamo	22 generateur	22 generador
23 Spannungsregler	23 voltage regulator	23 regol. di tens.	23 regulateur	23 regulador de tension
24 Blinker li hi	24 blinker left rear	24 lampegg. post. sn.	24 clign.arr.gauche	24 interm.izquierdo trasero
25 Blinker re hi	25 blinker right rear	25 lampegg. post. dx.	25 clign.arr.droit	25 interm.derecho trasero
26 Brems-Schlußlicht	26 rear-stoplight	26 fanal.post di freno	26 feu arr.et de stop	26 luz de freno trasero
27 Kondensator	27 capacitor	27 condensatore	27 condensateur	27 condensador
28 2-pol.Stecker	28 multip.cont.plug (2)	28 connettore a 2 poli	28 connect.multiple (2)	28 conector multiple (2)
29 4-pol.Stecker	29 multip.cont.plug (4)	29 connettore a 4 poli	29 connect.multiple (4)	29 conector multiple (4)
30 9-pol.Stecker	30 multip.cont.plug (9)	30 connettore a 9 poli	30 connect.multiple (9)	30 conector multiple (9)
31 Stecksicherung 10A	31 fuse 10A	31 fusibile 10A	31 fusible 10A	31 fusible principal 10A
32 Kurzschlußschalter	32 short circuit switch	32 con. corto cicuito	32 bouton de masse	32 interruptor a masa
33 Stecksicherung 5A	33 fuse 5A	33 fusibile 5A	33 fusible 5A	33 fusible 5A
34 Thermoschalter	34 temperature switch	34 interuttore di temp.	34 sonde de temp.	34 interruptor temperatura
35 Ventilator	35 fan	35 termointerruttore	35 ventilateur	35 ventilador electrico
bl blau	bl blue	bl blu	bl bleu	bl azul
br braun	br brown	br marrone	br brun	br marron
ge gelb	ge yellow	ge giallo	ge jaune	ge amarillo
gr grau	gr grey	gr grigio	gr gris	gr gris
g grün	g green	g verde	g vert	g verde
o orange	o orange	o arancione	o orange	o naranja
r rot	r red	r rosso	r rouge	r roja
s schwarz	s black	s nero	s noir	s negro
v violett	v violet	v violetta	v violet	v violeta
w weiß	w white	w bianco	w blanc	w blanco

Kontaktbelegung Kurzschlußschalter (Typ CEV 6302)

ENGINE	s	bl
RUN		
OFF	●	

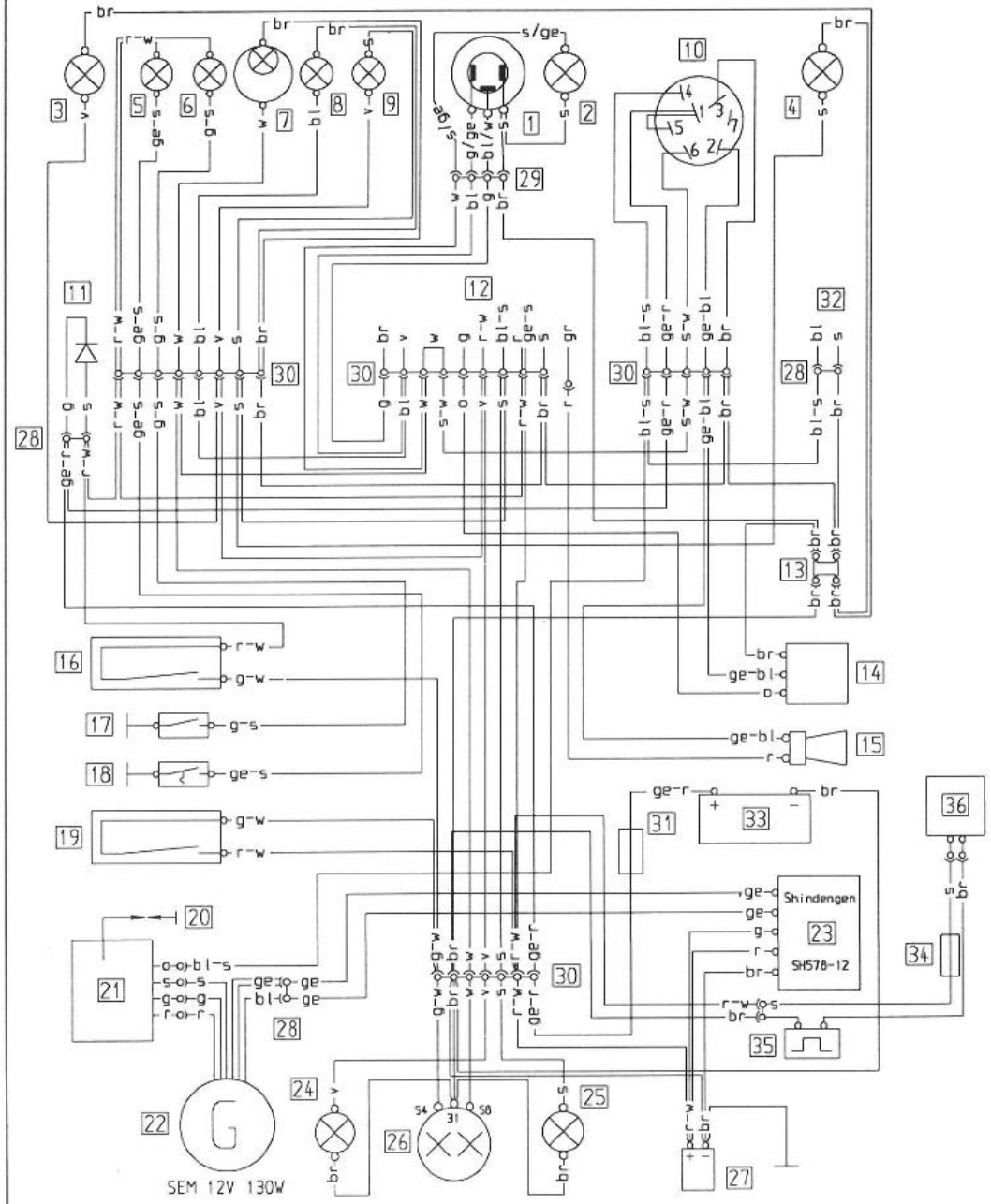
Kontaktbelegung Zündschloß (Typ CEV 7-pol.)

	1	2	3	4	5	6	7
PARK			●	●		●	
AUS			●				
EIN	●	●			●	●	
EIN	●	●			●	●	●

Kontaktbelegung – Kombischalter (Typ CEV 10082&000)

	s	br	v	r-w	s-bl	g	gr	r/ge-s
TURN L				●	●			
TURN R					●			
LIGHTS ●								
H LO		●						●
H HI			●					●
HORN	●						●	
PASSING		●	●					●

KTM SERVICE	Modell: 400/620 LC4 EGS '97 (m. Batt.)	Kabelstrangnummer: vorne: 583.11.475.300 hinten: 583.11.476.000	Land: A, CH	Datum, Name: 16.10.95 EK	Zeichnungsnr.: 41 4657M8S-	Änderungsstand:	Kabelstrangbez.: vo: 4T E-GS 95 hi: CEV 358 m Bt



Deutsch	Englisch	Italienisch	Französisch
1 Scheinwerfer	1 headlight	1 faro	1 phare
2 Standlicht	2 parking light	2 luce di posizione	2 feu de position
3 Blinker li vo	3 blinker left front	3 lampegg. ant. sn.	3 clignoteur av.gauche
4 Blinker re vo	4 blinker right front	4 lampegg. ant. dx.	4 clignoteur av.droit
5 Temperaturkontrolle	5 temperature control	5 controllo temperatura	5 temoin d.temperature
6 Leerlaufanzeige	6 neutral	6 indicat.marcia folle	6 ind.de point mort
7 Tachobeleuchtung	7 tachometer light	7 luce di tachimetro	7 eclair.comp.vitesse
8 Fernlichtkontrolle	8 high beam control	8 spia abbagliante	8 temoin de feu route
9 Blinkerkontrolle	9 blink control	9 spia lampeggiatori	9 temoin de clignoteur
10 Zündschloß	10 ignition switch	10 int. accensione	10 contact d'allum.
11 Diode	11 diode	11 diodo	11 diode
12 zum Kombischalter	12 to combinat. switch	12 multicomando	12 commutateur
13 Masseanschluß	13 ground connection	13 collegam. a massa	13 masse
14 Blinkgeber	14 blink signal system	14 trasmett. di lampeg.	14 centrale clignot
15 Horn	15 horn	15 clacson	15 klaxon
16 Bremslichtsch. vo	16 stoplight switch f.	16 int.luce arresto ant.	16 cont.de stop av.
17 Leerlaufschalter	17 neutral switch	17 interr luce folle	17 contact.de pt.mort
18 Temp.-schalter	18 temperature switch	18 int. temperatura	18 sonde de temp.
19 Bremslichtsch. hi	19 stoplight switch r.	19 int.luce arresto post.	19 cont.de stop der.
20 Zündkerze	20 spark plug	20 candela	20 bougie
21 Zündspule	21 ignition coil	21 bobina d'accens	21 bobine d'allumage
22 Generator	22 generator	22 dinamo	22 generateur
23 Spannungsregler	23 voltage regulator	23 regol. di tens.	23 regulateur
24 Blinker li hi	24 blinker left rear	24 lampegg. post. sn.	24 clign arr.gauche
25 Blinker re hi	25 blinker right rear	25 lampegg. post. dx.	25 clign arr.droit
26 Brems-Schlußlicht	26 rear-stoplight	26 fanal.post.di freno	26 feu arr.et de stop
27 Kondensator	27 capacitor	27 condensatore	27 condensateur
28 2-pol.Stecker	28 multip.cont.plug (2)	28 connettore a 2 poli	28 connect multiple (2)
29 4-pol.Stecker	29 multip.cont.plug (4)	29 connettore a 4 poli	29 connect multiple (4)
30 9-pol.Stecker	30 multip.cont.plug (9)	30 connettore a 9 poli	30 connect multiple (9)
31 Stecksicherung 10A	31 fuse 10A	31 fusibile 10A	31 fusible 10A
32 Kurzschlußschalter	32 short circuit switch	32 cam. corto circuito	32 bouton de masse
33 Batterie 1.2Ah	33 battery 1.2Ah	33 batteria 1.2Ah	33 batterie 1.2Ah
34 Stecksicherung 5A	34 fuse 5A	34 fusibile 5A	34 fusible 5A
35 Thermoschalter	35 temperature switch	35 termointerruttore	35 sonde de temp.
36 Ventilator	36 fun	36 ventilatore	36 ventilateur
bl blau	bl blue	bl blu	bl bleu
br braun	br brown	br marrone	br brun
ge gelb	ge yellow	ge giallo	ge jaune
gr grau	gr grey	gr grigio	gr gris
g grün	g green	g verde	g vert
o orange	o orange	o arancione	o orange
r rot	r red	r rosso	r rouge
s schwarz	s black	s nero	s noir
v violett	v violet	v violetta	v violet
w weiß	w white	w bianco	w blanc

Kontaktbelegung
Kurzschlußschalter
(Typ CEV 6302)

ENGINE	s	bl
RUN		
OFF	●	

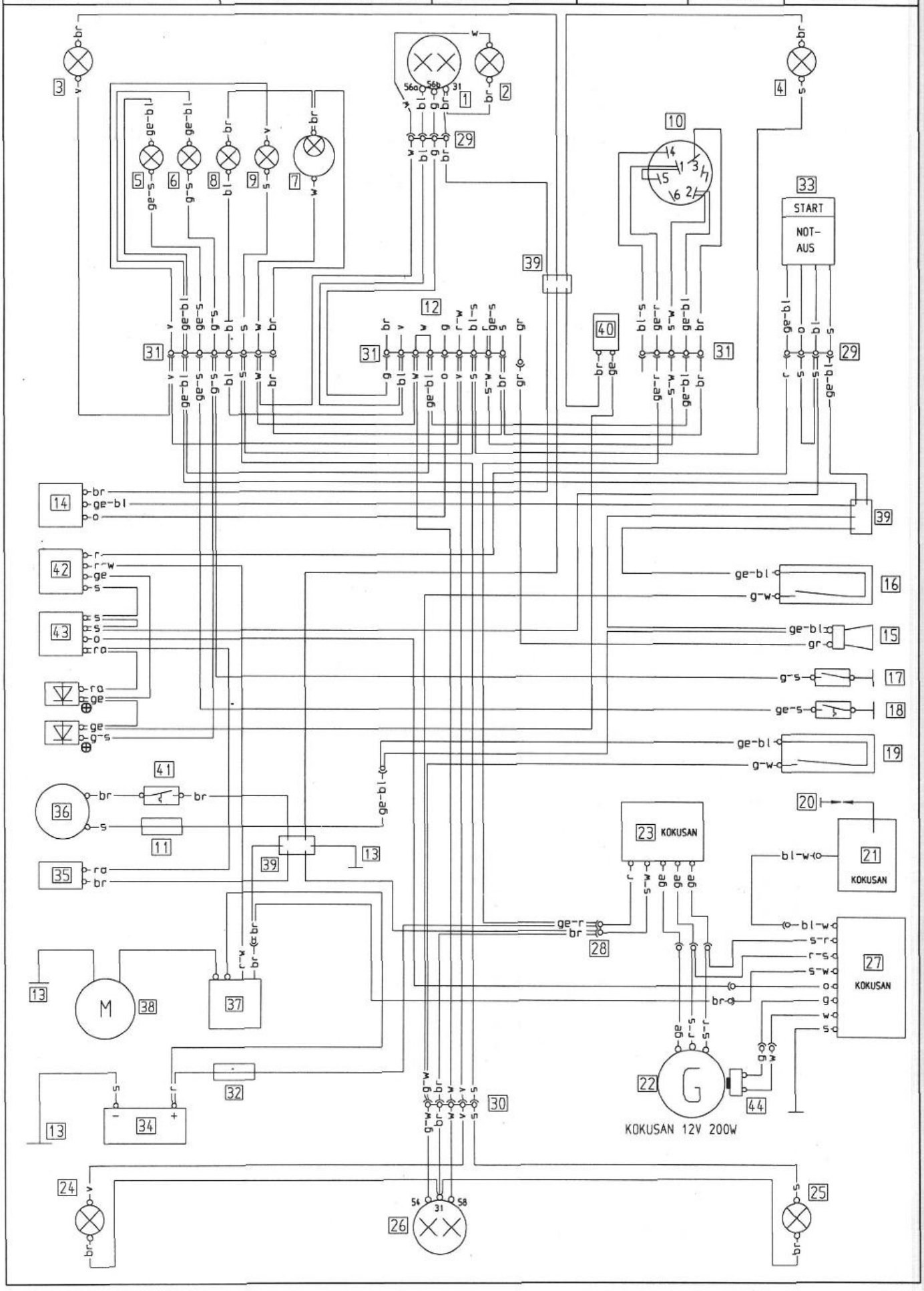
Kontaktbelegung
Zündschloß (Typ CEV 7-pol.)

	1	2	3	4	5	6	7
PARK	●		●	●		●	
AUS			●	●			
EIN	●	●			●	●	
EIN	●	●			●	●	●

Kontaktbelegung –
Kombischalter (Typ CEV 100826000)

	s	br	v	r-w	s-bl	g	gr	r/ge-s
TURN L				●				
TURN R					●			
LIGHTS ●								
H LO		●						●
H HI			●					●
HORN	●						●	
PASSING		●		●				●

SERVICE	Modell: 400/620 EGS-E, RXC-E '97	Kabelstrangnummer: vorne: 584.11.175.000 hinten: 584.11.176.000	Land: DIV. LÄNDER	Datum, Name: 15.05.96 KE	Kabelstrangbez.: vo: EGS-E '97 hi: EGS-E '97



KTM 400/620 EGS-E, RXC-E 1997

Deutsch	Englisch	Italienisch	Französisch
1 Scheinwerfer	1 headlight	1 faro	1 phare
2 Standlicht	2 parking light	2 luce di posizione	2 feu de position
3 Blinker li va	3 blinker left front	3 lampegg. ant. sn.	3 clignoteur av. gauche
4 Blinker re va	4 blinker right front	4 lampegg. ant. dx.	4 clignoteur av. droit
5 Temperaturkontrolle	5 temperature control	5 controllo temperatura	5 temoin de temperature
6 Leerlaufanzeige	6 neutral	6 indicat.marcia folle	6 ind.de point mort
7 Tachobeleuchtung	7 tachometer light	7 luce di tachimetro	7 eclair.comp.vitesse
8 Fernlichtkontrolle	8 high beam control	8 spia abbagliante	8 temoin de feu route
9 Blinkerkontrolle	9 blink control	9 spia lampeggiatori	9 temoin de clignoteur
10 Zündschloß	10 ignition switch	10 int. accensione	10 contact.d'allum
11 Lüftersicherung 5A	11 fan fuse 5A	11 fusibile 5A per ventola	11 fusible 5A pour ventil.
12 zum Kombischalter	12 to combinat. switch	12 multicomando	12 vers commutateur
13 Masseanschluß	13 ground connection	13 collegam. a massa	13 masse
14 Blinkgeber	14 blink signal system	14 trasmett. di lampeg.	14 centrale clignot.
15 Horn	15 horn	15 clacson	15 klaxon
16 Bremslichtsch. va	16 stoplight switch f.	16 int luce arresto ant.	16 cont.av de stop
17 Leerlaufschalter (N)	17 neutral switch (N)	17 interr luce folle (N)	17 contact.pt mort (N)
18 Thermoschalter	18 temperature switch	18 int. temperatura	18 contact de temperature
19 Bremslichtsch. hi	19 stoplight switch r.	19 int luce arresto post	19 contact.arr.de stop
20 Zündkerze	20 spark plug	20 candela	20 bougie
21 Zündspule	21 ignition coil	21 bobina d'accens.	21 bobine d'allumage
22 Generator	22 generator	22 dinamo	22 generateur
23 Regelgleichrichter	23 regulator-rectifier	23 regolatore di tens	23 regulat redresseur
24 Blinker li hi	24 blinker left rear	24 lampegg. post. sn	24 clign.arr.gauche
25 Blinker re hi	25 blinker right rear	25 lampegg. post. dx	25 clign.arr.droit
26 Brems-Schlußlicht	26 rear-stoplight	26 fanal.post.di freno	26 feu arr.et de stop
27 CDI-Einheit	27 CDI-unit	27 CDI-seatola	27 boitier CDI
28 2-pol.Stecker	28 multip.cont.plug (2)	28 connettore a 2 poli	28 connect.multiple (2)
29 4-pol.Stecker	29 multip.cont.plug (4)	29 connettore a 4 poli	29 connect.multiple (4)
30 6-pol.Stecker	30 multip.cont.plug (6)	30 connettore a 6 poli	30 connect.multiple (6)
31 9-pol.Stecker	31 multip.cont.plug (9)	31 connettore a 9 poli	31 connect.multiple (9)
32 Hauptsicherung 10A	32 mainfuse 10A	32 fusibile principale 10A	32 fusible principal 10A
33 Starttast Notaussch.	33 run-off/start switch	33 disinseritor/partire	33 bout.de demar/arr d'urg
34 Batterie 12V-8Ah	34 battery 12V 8Ah	34 batteria 12V 8Ah	34 batterie 12V 8Ah
35 Seitenständerschalter	35 sidestand switch	35 int.del cavalleto later.	35 commut.de bequille later
36 Lüftermotor	36 fan motor	36 ventilatore	36 ventilateur
37 Startrelaise	37 starter relay	37 rele d'avviamento	37 relaise de demarreur
38 Startermotor	38 starter engine	38 mot d'avviamento elettr.	38 demarreur electrique
39 Parallelverbinder	39 parallel connector	39 parallelo composto	39 parallele connecteur
40 Kupplungsschalter	40 clutch switch	40 interrutore frizione	40 contact.de embrayage
41 Thermoschalter	41 temperature switch	41 int. temperatura	41 contact.de temperature
42 Starterhilfsrelaise	42 startar auxil. relay	42 rele avviam. ausiliario	42 relaise auxi demarrage
43 Seitenständerrelaise	43 sidestand relay	43 rele del cavalleto later.	43 relaise com.de bequ.lat.
44 Impulsgeber	44 pulser coil	44 trasmettitore d'impulsi	43 capteur

Spanisch

1 faro
2 luz de posicion
3 interm. izquierdo delantero
4 intermitente derecho delantero
5 control temperatura
6 indicador punto muerto
7 luz tacometro
8 lampara aviso luces largas
9 lampara aviso intermitentes
10 llave de contacto
11 fusible del ventilador 5A
12 interruptor combinado
13 conector a masa
14 conjunto del intermitente
15 claxon
16 interruptor
17 interruptor punto muerto
18 interruptor temperatura
19 interruptor luz de frendo tras
20 bujia
21 bobina de encendido
22 generador
23 regulador de tension
24 intermitente izquierdo trasero
25 intermitente derecho trasero
26 luz de freno trasero
27 unidad cdi
28 conecdor multiple (2)
29 conector multiple (4)
30 conector multiple (6)
31 conector multiple (9)
32 fusible principal 10A
33 baton de arranque par de urg.
34 bateria 12V 8 Ah
35 int. del caballete lateral
36 ventilador electrica
37 rele de arranque
38 motor de arranque
39 conector paralelo
40 interruptor de embraque
41 interruptor temperatura
42 rele del arranque
43 rele del caballette lateral
44 generado de impulsos

Deutsch	Englisch	Italienisch	Französisch	Spanisch
bl blau	bl blue	bl blu	bl bleu	bl azul
br braun	br brown	br marrone	br brun	br marron
ge gelb	ge yellow	ge giallo	ge jaune	ge amarillo
gr grau	gr grey	gr grigio	gr gris	gr gris
g grün	g green	g verde	g vert	g verde
o orange	o orange	o arancione	o orange	o naranja
r rot	r red	r rosso	r rouge	r rojo
ro rosa	ro pink	ro rosa	ro rose	ro rosado
s schwarz	s black	s nero	s noir	s negro
v violett	v violet	v violetto	v violet	v violeta
w weiß	w white	w bianco	w blanc	w blanco

Kombischalter (Typ CEV 100826000)

	s	br	v	r-w	bl-s	g	gr	r/ge-s
TURN L				●		●		
TURN R					●	●		
LIGHTS ●								
H LO		●						●
H HI			●					●
HORN	●						●	
PASSING		●	●					●

Kontaktbelegung
Start- Notaus- Schalter

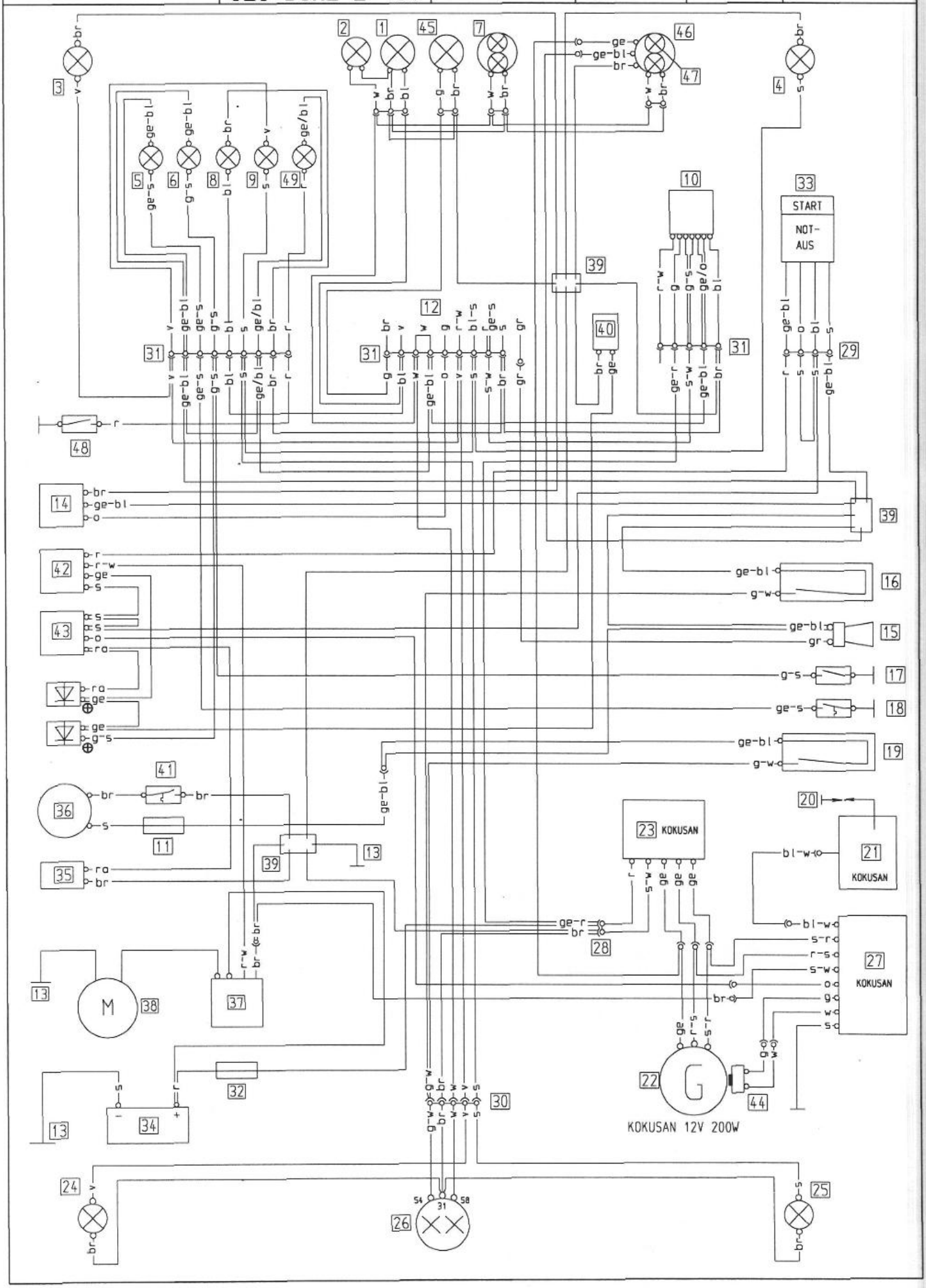
ENGINE \ CEV	o	ge-bl	bl	s
↻			●	●
⊠				
$	●	●		

Zündschloß (Typ CEV 7-pol.)

	1	2	3	4	5	6	7
PARK	●		●	●		●	
AUS			●	●			
EIN	●	●			●	●	
EIN	●	●			●	●	●
		●					●

9
9

KTM SERVICE	Modell: 620 DUKE-E '97	Kabelstrangnummer: vorne: 584.11.075.100 hinten: 584.11.176.000	Land: DIV. LÄNDER	Datum, Name: 26.03.97 KE	Kabelstrangbez.: vo: DUKE-E '97 hi: EGS-E '97



KTM 620 DUKE-E 1997

Deutsch	Englisch	Italienisch	Französisch
1 Fernlicht-Scheinwerfer	1 main beam headlight	1 abbagliante	1 phare
2 Standlicht	2 parking light	2 luce di posizione	2 feu de position
3 Blinker li vo	3 blinker left front	3 lampegg. ant. sn	3 clignoteur av. gauche
4 Blinker re vo	4 blinker right front	4 lampegg. ant. dx	4 clignoteur av. droit
5 Temperaturkontrolle	5 temperature control	5 controllo temperatura	5 temoin de temperature
6 Leerlaufanzeige	6 neutral	6 indicat. marcia folle	6 ind de point mort
7 Tachobeleuchtung	7 tachometer light	7 luce di tachimetro	7 eclair comp.vitesse
8 Fernlichtkontrolle	8 high beam control	8 spia abbagliante	8 temoin de feu route
9 Blinkerkontrolle	9 blink control	9 spia lampeggiatori	9 temoin de clignoteur
10 Zündschloß	10 ignition switch	10 int. accensione	10 contact.d'allum.
11 Lüftersicherung 5A	11 fan fuse 5A	11 fusibile 5A per ventola	11 fusible 5A pour ventil.
12 zum Kombischalter	12 to combinat. switch	12 multicomando	12 vers commutateur
13 Masseanschluß	13 ground connection	13 collegam. a massa	13 masse
14 Blinkgeber	14 blink signal system	14 trasmett. di lampeg.	14 centrale clignot.
15 Horn	15 horn	15 clacson	15 klaxon
16 Bremslichtsch. vo	16 stoplight switch f.	16 int luce arresto ant.	16 cont.av de stop
17 Leerlaufschatter (N)	17 neutral switch (N)	17 interr luce folle (N)	17 contact pt.mort (N)
18 Thermoschalter	18 temperature switch	18 int. temperatura	18 contact. de temperature
19 Bremslichtsch. hi	19 stoplight switch r.	19 int luce arresto post	19 contact.arr.de stop
20 Zündkerze	20 spark plug	20 candela	20 bougie
21 Zündspule	21 ignition coil	21 bobina d'accens	21 bobine d'allumage
22 Generator	22 generator	22 dinamo	22 generateur
23 Regelgleichrichter	23 regulator-rectifier	23 regolatore di tens	23 regulat.redresseur
24 Blinker li hi	24 blinker left rear	24 lampegg. post. sn	24 clign.arr.gauche
25 Blinker re hi	25 blinker right rear	25 lampegg. post. dx	25 clign.arr droit
26 Brems-Schlußlicht	26 rear-stoplight	26 fanal.post.di freno	26 feu arr.et de stop
27 CDI-Einheit	27 CDI-unit	27 CDI-seatola	27 boitier CDI
28 2-pol Stecker	28 multip.cont.plug (2)	28 connettore a 2 poli	28 connect.multiple (2)
29 4-pol Stecker	29 multip.cont.plug (4)	29 connettore a 4 poli	29 connect.multiple (4)
30 6-pol Stecker	30 multip.cont.plug (6)	30 connettore a 6 poli	30 connect.multiple (6)
31 9-pol Stecker	31 multip.cont.plug (9)	31 connettore a 9 poli	31 connect.multiple (9)
32 Hauptsicherung 10A	32 mainfuse 10A	32 fusibile principale 10A	32 fusible principal 10A
33 Starttast.Notaussch.	33 run-off/start switch	33 disinseritor/partire	33 bout.de demar/arr.d'urg
34 Batterie 12V 8Ah	34 battery 12V 8Ah	34 batteria 12V 8Ah	34 batterie 12V 8Ah
35 Seitenständerschalter	35 sidestand switch	35 int.del cavalleto later.	35 commut.de bequille later
36 Lüftermotor	36 fan motor	36 ventilatore	36 ventilateur
37 Startrelaise	37 starter relay	37 rele d'avviamento	37 relaise de demarreur
38 Startermotor	38 starter engine	38 mot.d'avviamento elettr.	38 demarreur electrique
39 Parallelverbinder	39 parallel connector	39 parallelo composto	39 parallele connecteur
40 Kupplungsschalter	40 clutch switch	40 interrutore frizione	40 contact.de embrayage
41 Thermoschalter	41 temperature switch	41 int. temperatura	41 contact.de temperature
42 Starterhilfsrelaise	42 startar auxil. relay	42 rele avviam. ausiliario	42 relaise auxi demarrage
43 Seitenständerrelaise	43 sidestand relay	43 rele del cavalleto later	43 relaise com.de bequ.lat.
44 Impulsgeber	44 pulser coil	44 trasmettitore d'impulsi	43 capteur
45 Abblendlicht	45 low beam	45 anabbaglianti	45 feu de croisement
46 Drehzahlmesser	46 tachometer	46 contagiri	46 compte-tours
47 Drehzahlmesserbel.	47 tachometer light	47 luce di contagiri	47 eclair compte-tours
48 Öldruckschalter	48 oil-pressure-switch	48 interrut.idraulico	48 mano-contact d'huile
49 Öldruckkontrolle	49 oil press.contr.	49 contr. press.oli	49 temoin press.huile

Spanisch			
1 faro	18 interruptor temperatura	35 int. del caballete lateral
2 luz de posicion	19 interruptor luz de frendo tras	36 ventilador electrica
3 interm. izquierdo delantero	20 bujia	37 rele de arranque
4 intermitente derecho delantero	21 bobina de encendido	38 motor de arranque
5 control temperatura	22 generador	39 conector paralelo
6 indicador punto muerto	23 regulador de tension	40 interruptor de embraque
7 luz tacometro	24 intermitente izquierdo trasero	41 interruptor temperatura
8 lampara aviso luces largas	25 intermitente derecho trasero	42 rele del arranque
9 lampara aviso intermitentes	26 luz de freno trasero	43 rele del caballette lateral
10 llave de contacto	27 unidad cdi	44 generado de impulsos
11 fusible del ventilador 5A	28 conecdor multiple (2)	45 luces de crule
12 interruptor combinado	29 conector multiple (4)	46 cuentarreveluciones
13 conector a masa	30 conector multiple (6)	47 luz del cuentarrevolucion.
14 conjunto del. intermitente	31 conector multiple (9)	48 manocontacto de aleite
15 claxon	32 fusible principal 10A	49 control presion aceite
16 interruptor	33 baton de arranque par de urg.	
17 interruptor punto muerto	34 bateria 12V 8 Ah	

Deutsch	Englisch	Italienisch	Französisch	Spanisch
bl blau	bl blue	bl blu	bl bleu	bl azul
br braun	br brown	br marrone	br brun	br marron
ge gelb	ge yellow	ge giallo	ge jaune	ge amarillo
gr grau	gr grey	gr grigio	gr gris	gr gris
g grün	g green	g verde	g vert	g verde
o orange	o orange	o arancione	o orange	o naranja
r rot	r red	r rosso	r rouge	r roja
ro rosa	ro pink	ro rosa	ro rose	ro rosado
s schwarz	s black	s nero	s noir	s negro
v violett	v violet	v violetta	v violet	v violeta
w weiß	w white	w bianco	w blanc	w blanco

Start- Notaus- Schalter

ENGINE \ CEV	o	ge-bl	bl	s
↺			●	
⊠				
$	●			

Zündschloß (Typ Zadi)

	ge/o	g	g-s	r-w	bl
↺	●	●			
⊠				●	
🔒				●	
P		●		●	

Kombischalter (Typ CEV 100826000)

	s	br	v	r-w	bl-s	g	gr	r/ge-s
TURN L ⇦				●		●		
TURN R ⇨					●	●		
LIGHTS •								
H LO		●						●
H HI			●					●
HORN	●					●		
PASSING		●	●					●

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FN 102019 d - Landesgericht Ried im Innkreis