

Workshop Manual

TC 250 / 2009

TC 250 / 2010

TE 250 / 2010

TXC 250 / 2010 (USA only)

Part. N. 8000 H1489 (10-2009)



Husqvarna

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1st edition (10-2009)

Workshop Manual

TC 250 / 2009 TC 250 / 2010 250:2010; TXC 250 / 2010 (USA only)

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MODELS COVERED (from serial number onwards)



1. Chassis serial number

TC 250: ZKHA300AAAV050001
TC 250 (USA): ZKHTC250#AV000001
TE 250: ZKHA300AAAV050001
TE 250 (USA): ZKHTE250#AV000001
TXC 250: ZKHTX250#AV000001

FOREWORD, TABLE OF CONTENTS

Foreword

This publication is designed for use by **HUSQVARNA** Service Centres to assist authorised personnel in the maintenance and repair of the models covered in this manual. The technical information provided in this manual is a critical complement to operator training and operators should become thoroughly familiar with it.

For ease of understanding, diagrams and photographs are provided next to the text.

Notes with special significance are identified as follows throughout the manual:



Accident-prevention rules for operator and persons working nearby.



Damage to vehicle and/or its components may result from non-compliance with relevant instructions.



Additional information concerning the operation covered in the text.

Useful tips

To prevent problems and ensure effective service work, observe the following **HUSQVARNA** recommendations:

- before repair, evaluate the customer's description of the problem and ask the appropriate questions to clearly identify problem symptoms;
- diagnose the problem and identify the causes clearly. This manual provides basic background information that must be supplemented with the operator's expertise and specific training available through **HUSQVARNA** held at regular periods;
- plan ahead before starting work: gather any spare parts and tools to avoid unnecessary delays;
- avoid unnecessary disassembly work to get to the part that needs repairing.

Always read the relevant instructions and follow the disassembly sequence outlined in this manual.

Recommended shop practices

- 1 Always replace gaskets, sealing rings and split pins with new ones.
- 2 When loosening or tightening nuts or bolts, always begin with the bigger ones or from the centre. Tighten to the specified torque and follow a cross pattern.
- 3 Always mark any parts or positions that might be confused upon assembly.
- 4 Use genuine **HUSQVARNA** parts and the recommended lubricant brands.
- 5 Use special tools where specified.
- 6 Technical Bulletins might contain more up-to-date setting data and procedures than this manual. Be sure to read them.



FOREWORD, TABLE OF CONTENTS

Table of Contents

Title	Section
Foreword, Table of Contents	a
Important Notices	b
General Information	A
Maintenance	B
Troubleshooting	C
Settings and Adjustments	D
General Procedures	E
Engine Disassembly	F
Engine Overhaul	G
Engine Reassembly	H
Front Suspension	I
Rear Suspension	J
Brakes	L
Electrical System	M
Engine Cooling	N
"KIT" Installation Instructions	O
Hydraulically Controlled Clutch	P
Optional Components	Q
Fuel Injection System	S
Special Tools	W
Tightening Torque Figures	X
Chassis and Wheels	Y

NOTES

Unless otherwise specified, data and specifications apply to all models.



IMPORTANT NOTICES



Section

b





IMPORTANT NOTICES



1) **TC and TXC** models are RACING motorcycles and are warranted to be free from operating defects; a scheduled maintenance chart for racing use is provided in Section B.

2) The **TE** model is for ROAD USE (DERATED); it is warranted to be free from defects and covered by legal warranty, provided that the STANDARD CONFIGURATION IS MAINTAINED and the maintenance chart provided in Section B is observed. For TE models modified to RACING SPECIFICATIONS (FULL POWER RATING), observe the scheduled maintenance chart for racing use provided in Section B.

* This motorcycle has not been designed to travel over long distances with the engine at top rpm, as in long-distance road or highway travel. Riding over long distances at full throttle may result in severe engine damage.

* The geometry and setup of this motorcycle have been designed for racing and to provide top performance when riding solo. We advise against riding two-up, whether off-road or on the track.

* ALWAYS remember that these motorcycles are specifically designed for racing, i.e. for usage conditions significantly different from those experienced in regular road use.



IMPORTANT

VEHICLE CONFIGURATION as outlined below is a prerequisite for the warranty to remain valid:

A) STANDARD MOTORCYCLE, FOR ROAD USE: DERATED;

B) RACING MOTORCYCLE, FOR RACING USE: FULL POWER RATING.

* In order to maintain the vehicle's "Guarantee of Functionality", the client must follow the maintenance programme indicated in Section B by having the required maintenance inspections carried out at authorised HUSQVARNA dealers. The cost for changing parts and for the labour necessary in order to comply with the maintenance plan is charged to the Client. The warranty becomes NULL AND VOID if the motorcycle is rented.

Notes

Left and right side is determined when seated on motorcycle.

Z: number of teeth

A: Austria

AUS: Australia

B: Belgium

BR: Brazil

CDN: Canada

CH: Switzerland

D: Germany

E: Spain

F: France

FIN: Finland

GB: Great Britain

I: Italy

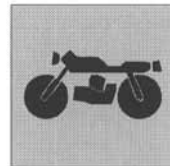
J: Japan

USA: United States of America

Unless otherwise specified, data and instructions apply to all market variants.



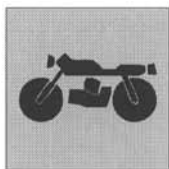
GENERAL INFORMATION



Section

A



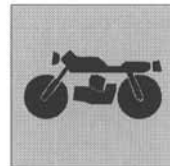


GENERAL INFORMATION

Engine	A.3
Timing system	A.3
Fuel system	A.3
Lubrication	A.3
Cooling	A.3
Ignition system.....	A.3
Starter	A.3
Drive and Transmission	A.3
Chassis.....	A.4
Suspension.....	A.4
Brakes	A.4
Wheels.....	A.4
Tyres.....	A.5
Electrical components location	A.5
Overall dimensions - Weight.....	A.6
Capacities.....	A.7



GENERAL INFORMATION



Engine

Single cylinder, 4 stroke

Bore 79 mm

Stroke 50.9 mm

Displacement 249.5 cu.in.

Compression ratio 13.6:1

Timing system

Type 4 radially arranged titanium valves

.operated by two chain and gear driven overhead camshafts via valve buckets

Valve clearance (cold with engine)

INTAKE 0.15 mm

EXHAUST 0.20 mm

Fuel system

Type (TC) "Keihin" FCR-MX 39 carburettor with accelerator pump and TPS
(Throttle Position Sensor) (Throttle valve position sensor)

Type (TE - TXC) Electronic injection feed, MIKUNI D42 throttle body

Air cleaning: dry air filter

Lubrication

Type Wet sump with positive displacement pump and cartridge and mesh filters

Cooling

Liquid with double radiator (TC)

Liquid with double radiator and electric fan (TE - TXC)

Ignition system

Electronic capacitive (TC) or inductive (TE - TXC) discharge ignition with adjustable advance (digital control)

Spark plug type "NGK" CR9EB

Spark plug electrode gap 0.7 ÷ 0.8 mm

Starter (TC) Kick start (with automatic decompressor)

Starter (TE - TXC) Electric starter and kick start (with automatic decompressor)

Drive and transmission

Clutch: oil bath multiple disc clutch, hydraulic control

Transmission: 5 (TC) or 6 (TE - TXC) gear ratios with constant-mesh gears

Motion is transmitted from engine to gearbox primary shaft through spur gears

Primary drive

Drive pinion gear z 17

Clutch ring gear z 54

Transmission ratio 3.176

Gear ratios (TC)

1st gear 2.142 (z 30/14)

2nd gear 1.750 (z 28/16)

3rd gear 1.450 (z 29/20)

4th gear 1.227 (z 27/22)

5th gear 1.041 (z 25/24)

Gear ratios (TE - TXC)

1st gear 2.142 (z 30/14)

2nd gear 1.750 (z 28/16)

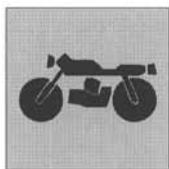
3rd gear 1.450 (z 29/20)

4th gear 1.227 (z 27/22)

5th gear 1.041 (z 25/24)

6th gear 0.884 (z 22/27)





GENERAL INFORMATION

Secondary drive

Motion is transmitted from gearbox to rear wheel by 5/8" x 1/4" final drive chain ("D.I.D." 520 DS or "REGINA" 135 RX3)

Transmission sprocket (TC) z 13

Transmission sprocket (TE - TXC) z 13

Rear wheel sprocket (TC)..... z 50

Rear wheel sprocket (TE - TXC) z 40

Transmission ratio (TC) 3.846

Transmission ratio (TE - TXC)..... 3.076

Total transmission ratios (TC)

1st gear..... 26.180

2nd gear 21.380

3rd gear 17.715

4th gear 14.994

5th gear 12.726

Total transmission ratios (TE - TXC)

1st gear..... 20.944

2nd gear 17.104

3rd gear 14.172

4th gear 11.995

5th gear 10.181

6th gear 7.964

Chassis

Single frame, in steel tubes with circular, rectangular and ellipsoidal section; light alloy rear chassis

Trail (mm) 111

Suspension

Front TC/2009:

"MARZOCCHI" upside-down telescopic hydraulic front fork with advanced axle; tube diameter 50 mm; rebound and compression damping adjustment.

travel (mm) 300

Front TC-TE-TXC/2010:

"KAYABA" upside-down telescopic hydraulic front fork with advanced axle; tube diameter 48 mm; rebound and compression damping adjustment.

Travel (mm) 300

Rear

Light alloy rising-rate swinging arm and "SACHS" hydraulic monoshock with coil spring.

(DUAL) adjustment for spring preload and compression damping and rebound damping adjustment.

Wheel travel (mm) 296

Brakes

Front

260 mm fixed drilled wave disc with floating calliper

Brake pad surface area 33.4 sq cm

Separate hydraulic circuit and master cylinder with control on right handlebar.

Rear

240 mm Ø floating wave disc with floating calliper

Brake pad surface area 23.5 sq cm

Separate hydraulic circuit, pedal and master cylinder on right side of vehicle.

Wheels

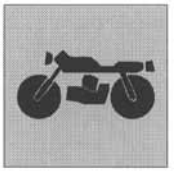
Rims

Front "TAKASAGO" Excel light alloy rim: 1.6x21"

Rear (TC)..... "TAKASAGO" Excel light alloy rim: 1.85x19"

Rear (TE - TXC) "TAKASAGO" Excel light alloy rim: 2.15x18"





Tyres

Front (TC).....	"Pirelli" 51R-MT 32A or "Dunlop" D756; 80/100 x 21"
Front (TE - TXC).....	"Michelin" ENDURO COMP. 3 or "Pirelli" MT 83 Scorpion; 90/90 x 21"
Front (TE USA).....	"Metzeler KAROO"; 90/90 x 21"
Rear (TC).....	"Pirelli" NHS (57) MT 32 or "Dunlop" D756; 100/90x19"
Rear (TE - TXC)	"Michelin" ENDURO COMP. 3 or "Pirelli" MT 83 Scorpion 120/90x18";
Rear (TE USA)	"Metzeler KAROO"; 140/80 x 18"
Cold tyre pressure - Front (TC)	0.9-1.0 Kg/sq cm
Cold tyre pressure - Front (TE - TXC) (*)	0.9-1.0 Kg/sq cm
Cold tyre pressure - Front (TE) (%).....	1.1 Kg/sq cm
Cold tyre pressure - Rear (TC).....	0.8-0.9 Kg/sq cm
Cold tyre pressure - Rear (TE - TXC) (*)	0.8-0.9 Kg/sq cm
Cold tyre pressure - Rear (TE) (%).....	1.0 Kg/sq cm

(*) Racing use - (%) Road use

Electrical components location (TC)

The ignition system includes the following elements:

- Generator on the inner side of L.H. crankcase half cover;
- Electronic ignition coil under the fuel tank;
- Electronic control unit under the fuel tank;
- Spark plug on cylinder head;
- Throttle position sensor on carburettor.

Electrical components location (TXC)

The ignition system includes the following elements:

- Generator on the inner side of L.H. crankcase half cover;
- Electronic ignition coil under the fuel tank;
- Electronic control unit under the fuel tank;
- Voltage regulator under the fuel tank;
- Spark plug on cylinder head;
- 12V-450W starter motor behind the engine cylinder;
- Solenoid starter on the left of rear chassis;
- M.A.Q.S. sensor (pressure, throttle position, air temperature) on throttle body.

The electrical system includes the following elements:

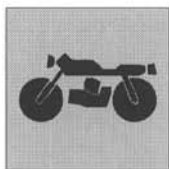
- 12V-6Ah battery under the saddle;
- Electric fan relay on right side of chassis;
- Electric fan;
- Two 15A and 20A fuses on right side of rear chassis;
- Coolant temperature sensor;
- Lambda sensor;
- Fuel pump inside the fuel tank.
- Fuel and reserve indicator.

Electrical components location (TE)

The ignition system includes the following elements:

- Generator on the inner side of L.H. crankcase half cover;
- Electronic ignition coil under the fuel tank;
- Electronic control unit under the fuel tank;
- Voltage regulator under the fuel tank;
- Spark plug on cylinder head;
- 12V-450W starter motor behind the engine cylinder;
- Solenoid starter on the left of rear chassis;
- M.A.Q.S. sensor (pressure, throttle position, air temperature) on throttle body.

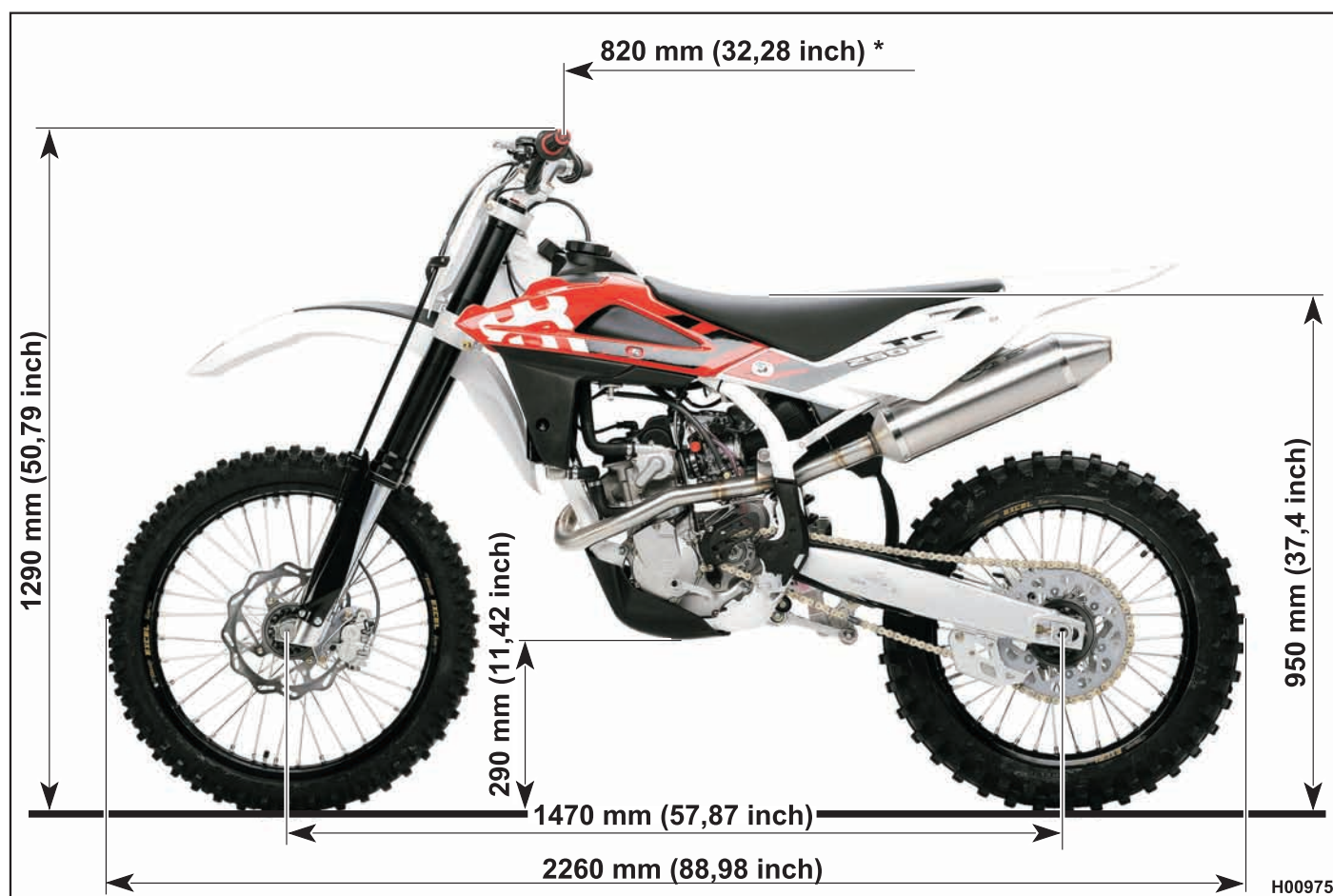




GENERAL INFORMATION

The electrical system includes the following elements:

- 12V-6Ah battery under the saddle;
- Turning indicator flasher on left side of rear chassis;
- Relay for electric fan, fuel injection system and lights on right side of chassis;
- Electric fan;
- Two 15A fuses and one 20A fuse on right side of rear chassis;
- Coolant temperature sensor;
- Lambda sensor;
- Headlamp with 12V-35W twin halogen bulb and 12V-3W parking light bulb;
- LED tail light with stop light bulb;
- 12V-10W turning indicator bulbs;
- Fuel pump inside the fuel tank.
- Odometer.



Overall dimensions - Weight

Kerb weight, without fuel (TC):95 Kg (209.4 lb)

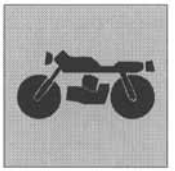
Kerb weight, without fuel (TE):102.5 Kg (225.9 lb)

Kerb weight, without fuel (TXC):99.5 Kg (219.3 lb)

*: max. width



GENERAL INFORMATION



Capacities	Type	Quantity
Fuel tank (TC)	98 octane unleaded fuel	7 litres
Fuel tank (TE - TXC)	98 octane unleaded fuel	6.5 litres
Gearbox/engine oil	CASTROL POWER 1 RACING (SAE 10W50)	0.9 litres (oil change and oil filter replacement) 0.7 litres (oil change)
Front fork oil (TC 2009) TC:	AGIP FORK 7,5 (SAE 7,5; SAE 5 for extremely cold weather)	300 cu cm
Front fork oil (MY 2010) TC: TXC: TE:	KAYABA KHL15-11 (SAE 7,5; SAE 5 for extremely cold weather)	325 cu cm 325 cu cm 100 mm
Rear shock absorber oil	CASTROL SYNTHETIC FORK OIL (5W)	0.9 litres
Coolant	CASTROL MOTORCYCLE COOLANT	
Front brake fluid	CASTROL RESPONSE SUPER (DOT 4)	
Rear brake fluid	CASTROL RESPONSE SUPER (DOT 4)	
Clutch fluid	CASTROL FORK OIL (10W)	
Drive chain lubrication	CASTROL CHAIN LUBE RACING	
Grease lubrication	CASTROL LM GREASE 2	
Electric contact protection	CASTROL METAL PARTS CLEANER	
Fillers for radiator	AREXONS LIQUID FILLER	
Air filter oil	AGIP FORMULA FILTER "Foam air filter protection oil"	
Air filter detergent	AGIP "Filter clean foam air detergent fluid"	

IMPORTANT - Do not add any additives to fuel or lubricants.



MAINTENANCE



Section

B





MAINTENANCE

TC - TE - TXC RACING MOTORCYCLE, FOR RACING USE: FULL POWER RATING	SCHEDULED MAINTENANCE CHART (TO BE CARRIED OUT AT THE HUSQVARNA DEALER)							
	SERVICE COUPON		SERVICE COUPON	SERVICE COUPON	SERVICE COUPON	SERVICE COUPON		
PART	AFTER FIRST 3 HOURS	EVERY 4h MX/8h EN	EVERY 8h MX/16h EN	EVERY 16h MX/32h EN	EVERY 32h MX/64h EN	EVERY 40h MX/80h EN	REPLACE AS REQUIRED	SEE PAGE
VALVES	C (•)			C (•)		S (#)		
VALVE SPRINGS						C	X	
VALVE SPRING RETAINERS, VALVE COLLETS						C	X	
VALVE BUCKETS						C	X	
CAMSHAFT						C		
TIMING CHAIN					C	S		
TIMING CHAIN SLIDER						C/S		
TIMING DRIVEN GEAR						C	X	
TIMING DRIVE GEAR					C		X	
TIMING CHAIN TENSIONER						C		
INTAKE COUPLING			C		S			
COMPLETE CYLINDER				C	S	C	X	
COMPLETE PISTON				S	C	S		
COMPLETE CONNECTING ROD						S		
CRANKCASE BEARINGS						S		
ENGINE OIL	S	C	S					
OIL PUMP					C			
OIL FILTER/MESH FILTER	S, P		S, P					
OIL PUMP TO CRANKCASE OIL LUBRICATION PIPE						C		
PRIMARY DRIVE GEAR PAIR				C				
CLUTCH HUB				C			X	
CLUTCH PLATES			C		S		X	
CLUTCH PRESSURE PLATE					C			
CLUTCH SPRINGS					C		X	
CLUTCH HOUSING					C			
CLUTCH PUSHROD					C			
TRANSMISSION SPROCKET		C	S				X	
STARTER GEARS					C		X	



MAINTENANCE



TC - TE - TXC RACING MOTORCYCLE, FOR RACING USE: FULL POWER RATING	SCHEDULED MAINTENANCE CHART (TO BE CARRIED OUT AT THE HUSQVARNA DEALER)							
	SERVICE COUPON		SERVICE COUPON	SERVICE COUPON	SERVICE COUPON	SERVICE COUPON		
PART	AFTER FIRST 3 HOURS	EVERY 4h MX/8h EN	EVERY 8h MX/16h EN	EVERY 16h MX/32h EN	EVERY 32h MX/64h EN	EVERY 40h MX/80h EN	REPLACE AS REQUIRED	SEE PAGE
KICK START PEDAL				L				
GEAR SHIFT PEDAL			C					
SPARK PLUG			P	S				
SPARK PLUG CAP				C				
CARBURETTOR		P				R		
CARBURETTOR THROTTLE VALVE						C		
AIR FILTER		P, L						
RADIATORS		C						
WATER HOSES AND CLAMPS		C						
RADIATORS TO WATER PUMP HOSE		C						
COOLANT		C					X	
FOOTPEGS, PINS, SPRINGS			C				X	
REAR CHASSIS MNTG BOLTS, ENGINE MNTG BOLTS	C			C				
SIDE STAND		C						
CHAIN GUIDE ROLLER, BEARINGS		C						
STEERING HEAD, BOTTOM YOKE WITH STEM			L					
FRONT FORK			R					
HANDLEBAR MOUNTS AND FASTENERS	C			C				
REAR SWINGING ARM BUSHING				C				
REAR CHAIN SLIDER				C			X	
REAR SUSPENSION LINKAGE BUSHINGS				C				
CHAIN GUIDE/CHAIN GUARD		C					X	
SWINGING ARM AXLE ROLLER CAGES			L					
REAR SHOCK ABSORBER						R		
ROLLER CAGES, LINKAGE PINS OF REAR SUSP.		L						
COMPLETE THROTTLE CONTROL		C, L						
COMPLETE CLUTCH CONTROL		C (•)				R (#)		





MAINTENANCE

TC - TE - TXC RACING MOTORCYCLE, FOR RACING USE: FULL POWER RATING	SCHEDULED MAINTENANCE CHART (TO BE CARRIED OUT AT THE HUSQVARNA DEALER)							
	SERVICE COUPON		SERVICE COUPON	SERVICE COUPON	SERVICE COUPON	SERVICE COUPON		
PART	AFTER FIRST 3 HOURS	EVERY 4h MX/8h EN	EVERY 8h MX/16h EN	EVERY 16h MX/32h EN	EVERY 32h MX/64h EN	EVERY 40h MX/80h EN	REPLACE AS REQUIRED	SEE PAGE
THROTTLE CABLES		C		L			X	
FRONT BRAKE DISC			C				X	
FRONT BRAKING SYSTEM FLUID		C				S		
REAR BRAKE DISC			C				X	
REAR BRAKING SYSTEM FLUID		C				S		
BRAKE PADS		C					X	
MASTER CYLINDER TO BRAKE CALLIPER HOSES		C						
FUEL PIPES		C				S	X	
SILENCER SOUND DEADENING MATERIAL			S				X	
EXHAUST PIPE AND SILENCER		C					X	
WHEEL SPOKE TENSION	C		C					
WHEEL HUB BEARINGS					S		X	
REAR CHAIN SPROCKET			S				X	
SPROCKET BOLT TIGHTENING	C		C					
SECONDARY DRIVE CHAIN	C, L		S				X	
TORQUE OF NUTS AND BOLTS	C			C				

LEGEND

h: HOURS
 S: REPLACE
 C: CHECK
 C (•): CHECK CLEARANCE
 P: CLEAN
 R: OVERHAUL
 L: GREASE/LUBRICATE
 MX: MOTOCROSS
 EN: ENDURO
 (#) SEE WORKSHOP MANUAL

NOTES:

- REPLACE GASKETS AND SEALS AFTER EACH REMOVAL;
- REPLACE SCREWS AND BOLTS IF DAMAGED;
- PERFORM A GENERAL INSPECTION AFTER RIDING ON MUDDY OR SANDY TERRAIN.



MAINTENANCE



SCHEDULED MAINTENANCE CHART (TO BE CARRIED OUT AT THE HUSQVARNA DEALER)					
TE - STANDARD MOTORCYCLE, FOR ROAD USE (DERATED)	AFTER FIRST 1000 KM	EVERY 5000 KM	EVERY 10000 KM	REPLACE AS REQUIRED	SEE PAGE
VALVES	C (•)	C (•)	S (#)		
VALVE SPRINGS			C	X	
VALVE SPRING RETAINERS, VALVE COLLETS			C	X	
VALVE BUCKETS			C	X	
CAMSHAFT			C		
TIMING CHAIN			S		
TIMING CHAIN SLIDER		C	S		
TIMING DRIVEN GEAR			C	X	
TIMING DRIVE GEAR			C		
TIMING CHAIN TENSIONER			C		
INTAKE COUPLING		C	S	X	
COMPLETE CYLINDER			C	X	
COMPLETE PISTON			S		
COMPLETE CONNECTING ROD			S		
CRANKCASE BEARINGS			S		
ENGINE OIL AND OIL FILTER	S	S	S		
OIL PUMP			C		
OIL FILTER/MESH FILTER	S, P	S, P			
OIL PUMP TO CRANKCASE OIL FEED			C		
PRIMARY DRIVE GEAR PAIR		C		X	
CLUTCH HUB		C		X	
CLUTCH PLATES		C	S	X	
CLUTCH PRESSURE PLATE			C		
CLUTCH SPRINGS			C	X	
CLUTCH PUSHROD			C		
TRANSMISSION SPROCKET		C	S		
STARTER GEARS			C	X	





MAINTENANCE

SCHEDULED MAINTENANCE CHART (TO BE CARRIED OUT AT THE HUSQVARNA DEALER)					
TE - TXC - STANDARD MOTORCYCLE, FOR ROAD USE (DERATED)	AFTER FIRST 1000 KM	EVERY 5000 KM	EVERY 10000 KM	REPLACE AS REQUIRED	SEE PAGE
PART	SERVICE COUPON	SERVICE COUPON	SERVICE COUPON		
KICK START PEDAL			L		
GEAR SHIFT PEDAL				X	
SPARK PLUG		P	S		
SPARK PLUG CAP		C	C	X	
AIR FILTER		P, L	P, L	X	
RADIATORS					
WATER HOSES AND CLAMPS		C	C		
RADIATORS TO WATER PUMP HOSE		C	C		
FOOTPEGS, PINS, SPRINGS				X	
REAR CHASSIS MNTG BOLTS, ENGINE MNTG BOLTS	C		C		
SIDE STAND		C			
CHAIN GUIDE ROLLER, BEARING		C	C	X	
STEERING HEAD, BOTTOM YOKE WITH STEM			L		
FRONT FORK			R		
HANDLEBAR MOUNTS WITH FASTENERS	C		C		
REAR SWINGING ARM BUSHING			C		
REAR CHAIN SLIDER			C	X	
REAR SUSPENSION LINKAGE BUSHINGS			C	X	
CHAIN GUIDE/CHAIN GUARD	C	C		X	
ROLLER CAGES, LINKAGE PINS OF REAR SUSP.		L			
REAR SHOCK ABSORBER			C		
COMPLETE THROTTLE CONTROL		C, L			
COMPLETE CLUTCH CONTROL		C (•)	R (#)		
THROTTLE CABLES		C	L	X	
FRONT BRAKE DISC			C	X	
FRONT BRAKING SYSTEM FLUID		C	S		



MAINTENANCE



SCHEDULED MAINTENANCE CHART (TO BE CARRIED OUT AT THE HUSQVARNA DEALER)

TE - STANDARD MOTORCYCLE, FOR ROAD USE (DERATED)	AFTER FIRST 1000 KM	EVERY 5000 KM	EVERY 10000 KM	REPLACE AS REQUIRED	SEE PAGE
PART	SERVICE COUPON	SERVICE COUPON	SERVICE COUPON		
REAR BRAKE DISC			C	X	
REAR BRAKING SYSTEM FLUID		C	S		
BRAKE PADS	C	C	C	X	
MASTER CYLINDER TO BRAKE CALLIPER HOSES			C	X	
FUEL PIPES			C	X	
SILENCER SOUND DEADENING MATERIAL				X	
EXHAUST PIPE AND SILENCER		C		X	
WHEEL SPOKE TENSION	C		C		
WHEEL HUB BEARINGS			C	X	
REAR CHAIN SPROCKET			S		
SPROCKET BOLT TIGHTENING	C	C	C		
SECONDARY DRIVE CHAIN	C, L	C, L	S		
TORQUE OF NUTS AND BOLTS	C	C			

LEGEND

S: REPLACE
 C: CHECK
 C (•): CHECK CLEARANCE
 P: CLEAN
 R: OVERHAUL
 L: GREASE/LUBRICATE

NOTES:

- REPLACE GASKETS AND SEALS AFTER EACH REMOVAL;
- REPLACE SCREWS AND BOLTS IF DAMAGED;
- PERFORM A GENERAL INSPECTION AFTER RIDING ON MUDDY OR SANDY TERRAIN.





Section

C





TROUBLESHOOTING

ENGINE

Trouble	Cause	Remedy
Engine does not start or has starting trouble	Insufficient compression	
	1. Piston seized	Replace
	2. Connecting rod small or big end seized	Replace
	3. Worn piston rings	Replace
	4. Worn cylinder	Replace
	5. Cylinder head loosely tightened	Tighten
	6. Head gasket leaking	Replace
	7. Spark plug loose	Tighten
	8. Incorrect valve clearances	Adjust
	9. Weak or seized valve springs	Replace
	10. Seized valves	Replace
	Weak or no spark	
	1. Spark plug faulty	Replace
	2. Fouled or wet spark plug	Clean or dry
	3. Spark plug electrode gap too wide	Adjust
	4. Ignition coil faulty	Replace
	5. High-tension cables open circuit or shorted	Check
	6. Electronic control unit faulty	Replace
	7. Right-hand switch faulty (TE - TXC)	Replace
	Carburettor is receiving no fuel (TC)	
	1. Tank cap breather clogged	Clean
	2. Fuel cock clogged	Clean
	3. Fuel feed pipe clogged	Clean
	4. Filter on carburettor fitting dirty	Clean
	5. Floater valve or floaters faulty	Replace
	6. Linkage is blocking floater valve	Release
	Carburettor floods (TC)	
	1. High fuel level in bowl	Adjust
	2. Floater valve or floaters worn or stuck open	Replace or release
Engine stalls easily	1. Fouled spark plug	Clean
	2. Electronic control unit faulty	Replace
	3. Carburettor jets clogged	Clean
	4. Low idle	Adjust
Engine is noisy	Noise seems to come from piston	
	1. Too much piston-to-cylinder clearance	Replace
	2. Worn piston rings or piston grooves	Replace
	3. Too much carbon build-up in combustion chamber or on piston crown	Clean
	4. Valve clearances too large	Adjust
	5. Weak or seized valve springs	Replace
	6. Worn timing chain	Replace
	7. Incorrect timing chain tension	Adjust
	Noise seems to come from crankshaft	
	1. Worn main bearings	Replace
	2. Connecting rod big end has too much side clearance or end float	Replace
	3. Crankshaft gear damaged	Replace
	4. Crankshaft locknut loose	Tighten



TROUBLESHOOTING



Trouble	Cause	Remedy
	Noise seems to come from the clutch	
	1. Worn plates	Replace
	2. Too much clearance between clutch housing and friction plates	Replace
	Noise seems to come from gearbox	
	1. Worn gears	Replace
	2. Worn gear grooves	Replace
Noise seems to come from secondary drive chain	1. Chain stretched (worn) or improperly adjusted	Replace or adjust
	2. Worn transmission sprocket and rear chain sprocket	Replace
Clutch slips	1. Weak clutch springs	Replace
	2. Worn clutch plates	Replace
Clutch is hard to operate	1. Uneven spring load	Replace
	2. Bent clutch plates	Replace
Gears do not engage	1. Bent or seized shifter forks	Replace
	2. Worn gear ratchets	Replace
	3. Damaged shifter fork shafts	Replace
Gear shift pedal does not return to original position	1. Weak or broken selector return spring	Replace
	2. Worn shifter forks	Replace
Transmission jumps out of gear	1. Worn sliding gear dogs	Replace
	2. Worn gear grooves	Replace
	3. Worn dog slots in gears	Replace
	4. Worn selector shaft splines	Replace
	5. Damaged shifter fork shafts	Replace
Engine has low power	1. Dirty air filter	Clean
	2. Carburettor main jet clogged or is the wrong size (TC)	Clean or Replace
	3. Poor fuel quality	Replace
	4. Intake coupling loose	Tighten
	5. Spark plug electrode gap too wide	Adjust
	6. Insufficient compression	Identify cause
	7. Incorrect valve clearances	Adjust
	8. Valve seats or guides faulty	Replace
	9. Weak or seized valve springs	Replace
Engine overheats	1. Combustion chamber and/or piston crown fouled with carbon deposits	Clean
	2. Insufficient oil in engine or wrong oil	Top up or change
	3. Obstructions blocking air flow on radiator	Clean
	4. Cylinder head gasket leaking	Replace
	5. Clutch slips	Adjust
	6. Cooling fan faulty (TE-TXC)	Replace thermal switch





TROUBLESHOOTING

CHASSIS

Trouble	Cause	Remedy
Handlebar turns hard	<ol style="list-style-type: none">1. Insufficient tyre pressure2. Bearing adjuster ring nut or steering stem nut overtightened3. Bent steering stem4. Worn or seized steering bearings	<p>Inflate</p> <p>Adjust</p> <p>Replace bottom yoke</p> <p>Replace</p>
Handlebar vibration	<ol style="list-style-type: none">1. Bent fork legs2. Bent front wheel axle3. Warped chassis4. Bent front wheel rim5. Worn front wheel bearings	<p>Replace</p> <p>Replace</p> <p>Replace</p> <p>Replace</p> <p>Replace</p>
Damping is too hard	<ol style="list-style-type: none">1. Too much oil in fork legs2. Fork oil viscosity too high3. Overinflated tyres4. Improperly set rear shock absorber	<p>Remove excess oil</p> <p>Change</p> <p>Deflate</p> <p>Adjust</p>
Damping is too soft	<ol style="list-style-type: none">1. Insufficient oil in fork legs2. Fork oil viscosity too low3. Weak fork springs4. Weak rear shock absorber spring5. Improperly set rear shock absorber	<p>Top up</p> <p>Change</p> <p>Replace</p> <p>Replace</p> <p>Adjust</p>
(Front / rear) wheel shakes	<ol style="list-style-type: none">1. Bent wheel rim2. Worn wheel hub bearings3. Incorrect spoke tension4. Wheel axle nut loose5. Worn rear swinging arm bearings6. Improperly adjusted chain tensioners7. Improperly balanced wheel	<p>Replace</p> <p>Replace</p> <p>Adjust</p> <p>Tighten</p> <p>Replace</p> <p>Adjust</p> <p>Balance</p>
Rear suspension is noisy	<ol style="list-style-type: none">1. Worn link rod spacers or bearings2. Worn shock absorber ball joints3. Shock absorber faulty	<p>Replace</p> <p>Replace</p> <p>Replace</p>
Poor braking (front and rear)	<ol style="list-style-type: none">1. Air in brake system2. Insufficient fluid in tank3. Worn brake pad and/or disc4. Damaged disc5. Improperly adjusted brake pedal6. Water in brake system	<p>Bleed</p> <p>Top up</p> <p>Replace</p> <p>Replace</p> <p>Adjust</p> <p>Change fluid</p>



TROUBLESHOOTING

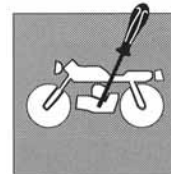


ELECTRICAL SYSTEM (see also Section M)

Trouble	Cause	Remedy
Spark plug fouls easily	<ol style="list-style-type: none">1. Mixture too rich2. Dirty air filter3. Worn piston rings4. Worn piston or cylinder liner	Adjust carburettor setting Clean Replace Replace
Spark plug electrodes overheat	<ol style="list-style-type: none">1. Mixture too lean2. Spark plug electrode gap too close3. Heat rating too high	Adjust carburettor setting Adjust Replace with recommended spark plug
Generator does not charge or is not providing enough charge	<ol style="list-style-type: none">1. Cables running to voltage regulator improperly connected or shorted2. Voltage regulator faulty3. Generator coil faulty	Connect correctly or replace Replace Replace
Generator overcharges battery	<ol style="list-style-type: none">1. Voltage regulator faulty	Replace
Battery does not hold charge (TE-TXC)	<ol style="list-style-type: none">1. Battery terminals dirty	Clean
Starter motor does not start or slips (TE-TXC)	<ol style="list-style-type: none">1. Battery is flat2. Control on R.H. switch faulty3. Starter relay faulty4. Starter motor faulty5. Worn starter gears6. Worn or damaged freewheel rollers	Charge Replace Replace Repair or replace Replace Replace freewheel

INJECTION FUEL FEEDING SYSTEM (TE-TXC) (See Section S)

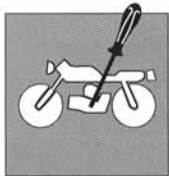




Section

D

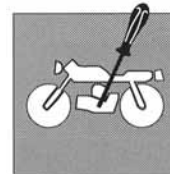


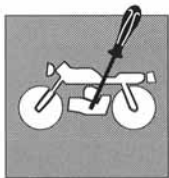


SETTINGS AND ADJUSTMENTS

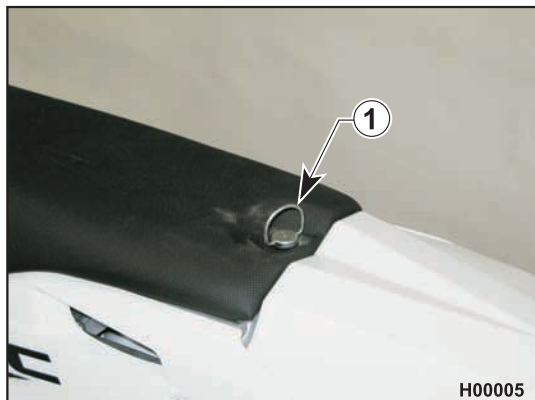
Saddle removal.....	D.4
Tank removal (TC).....	D.4
Tank removal (TE - TXC).....	D.5
Valve clearance adjustment.....	D.6
Throttle cable adjustment (TC).....	D.7
Throttle cable adjustment (TE - TXC).....	D.8
Enrichener lever play adjustment (TE - TXC).....	D.8
Carburettor adjustment (TC).....	D.9
Idle adjustment (TC).....	D.9
Idle adjustment (TE - TXC).....	D.9
Clutch plate replacement.....	D.10
Hydraulic clutch lever adjustment and fluid level check	D.11
Front brake lever adjustment and fluid level check	D.12
Rear brake pedal adjustment	D.13
Rear brake pedal free play adjustment.....	D.14
Rear brake fluid level check	D.14
Engine oil level check.....	D.15
Engine oil replacement and mesh filters-filter cartridge cleaning or replacement.....	D.16
Coolant level check	D.17
Coolant replacement	D.17
Air filter check (TC).....	D.18
Air filter check (TE - TXC).....	D.19
Air filter cleaning	D.19
Installation	D.20
Secondary drive chain adjustment	D.21
Chain lubrication.....	D.22
Removal and cleaning	D.22
Washing a chain without O-rings.....	D.22
Lubricating a chain without O-rings	D.22
Lubricating an O-ring chain	D.22
Suspension setup according to track condition	D.23
Rear shock absorber adjustment.....	D.24
Shock absorber spring preload adjustment.....	D.25
Shock absorber compression and rebound damping adjustment	D.26
Shock absorber springs.....	D.26
MARZOCCHI front fork adjustment (TC 2009).....	D.27
KAYBA front fork adjustment (TC - TE - TXC / 2010).....	D.28
KAYBA front fork springs	D.29
MARZOCCHI front fork springs	D.30
Steering bearing clearance adjustment.....	D.31
Steering angle adjustment.....	D.31
Changing handlebar position and height.....	D.32
Supply hose check (TC)	D.33
Supply hose check (TE - TXC)	D.33
Silencer sound deadening material replacement	D.34
Exhaust system check.....	D.35





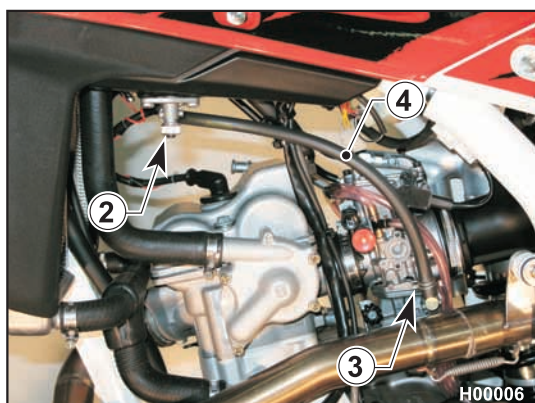


SETTINGS AND ADJUSTMENTS



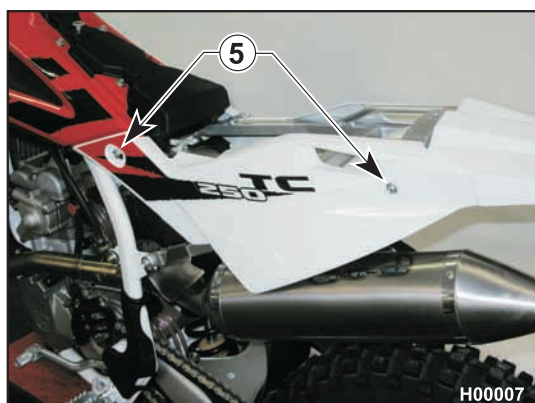
Saddle removal

Turn the rear fixing (1) counter clockwise, remove it and extract the saddle.

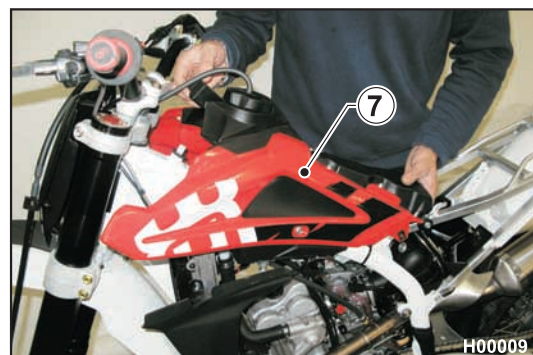
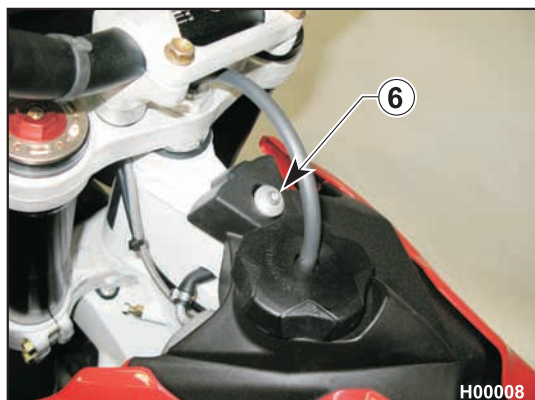


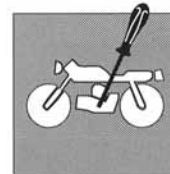
Tank removal (TC)

Close the fuel cock (2) and loosen the clamp (3) on the hose running to the carburettor. Detach hose (4) from carburettor making sure to drain any fuel in the hose into a container.



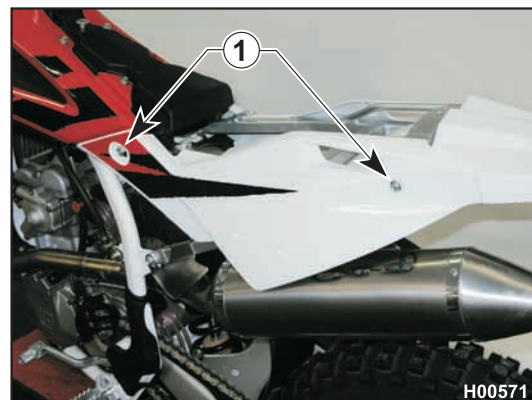
Remove the screws (5) and the side panels.



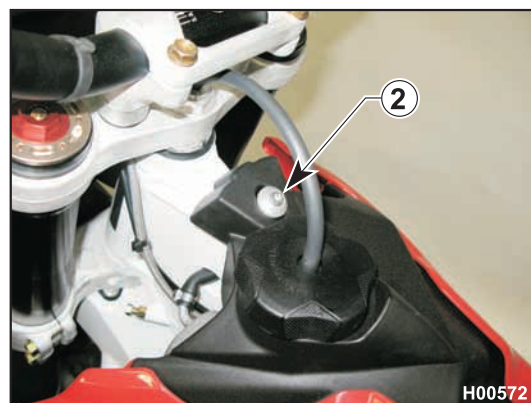


Tank removal (TE - TXC)

Remove the screws (1) and the side panels.



Remove the tank retaining screw (2).

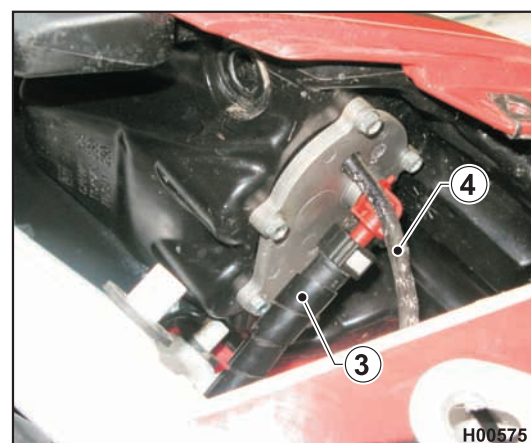
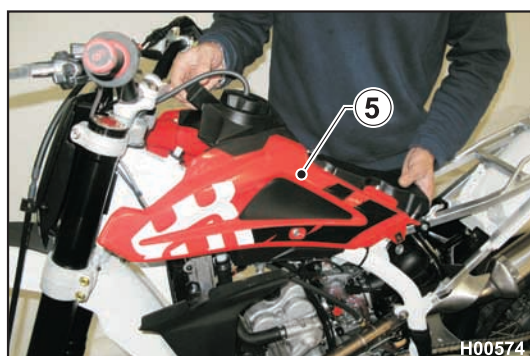


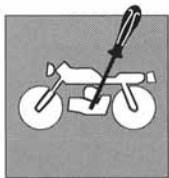
Lift the tank and disconnect the fuel pump connector from the main wiring harness.

Disconnect the supply hose (3) from the outlet fitting (4) on the fuel pump, located in the rear bottom section of the tank.

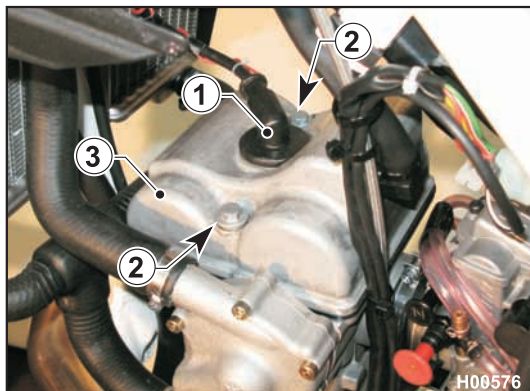


Remove the tank (5) together with the scoops.





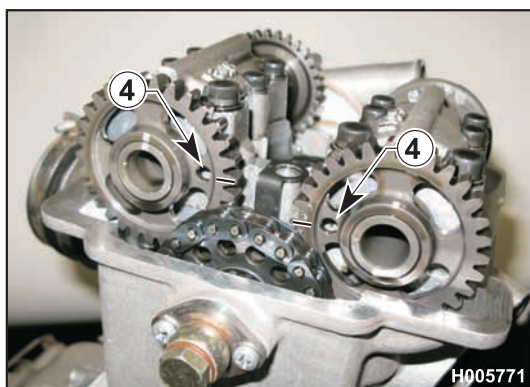
SETTINGS AND ADJUSTMENTS



Valve clearance adjustment

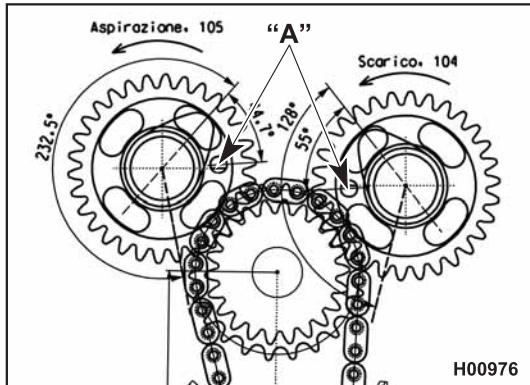
Remove saddle and tank as outlined in the relevant paragraphs.

Remove spark plug (1), both head cover screws (2) and head cover (3).



Engage the 2nd gear and push and pull the motorcycle back and forth to bring the piston to Top Dead Centre. In this condition, the holes (4) in the camshaft gears will be located at the positions shown.

Cover parting line "A" is visible through the holes (4).



Use a feeler gauge to make sure clearance is 0.15 mm on the INTAKE side and 0.20 mm on the EXHAUST side.

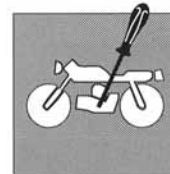
If not so, remove the shim from under the valve bucket and measure its thickness.

Depending on what you find, replace the shim with a new shim with the required thickness to achieve correct clearance (replacement shims are available in a 1.60 mm to 2.60 mm thickness range, in 0.05 mm increments).

Check valve clearances again. If clearances are correct, refit the parts you have removed reversing the disassembly procedure.

For camshaft disassembly and reassembly, see Section "F" Engine disassembly and Section "H" Engine assembly.





Throttle cable adjustment (TC)

To check the correct adjustment of the throttle cable, operate as follows:

- remove the rubber gaiter (1) at cable end;
- push and pull cable (2) to make sure it has about 2 mm free play;
- if not so, loosen the lock ring nut (3) and suitably turn the adjuster screw (4) (loosen to decrease play or tighten to increase it);
- tighten back the lock ring nut (3).

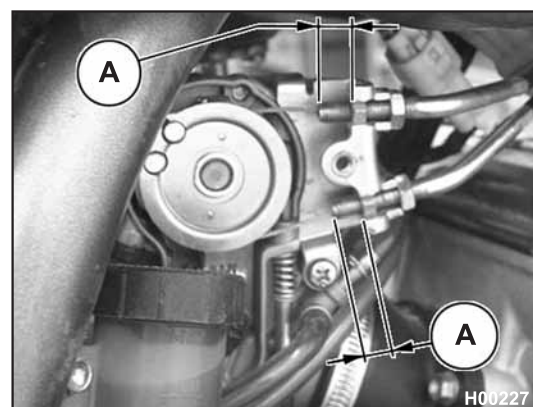
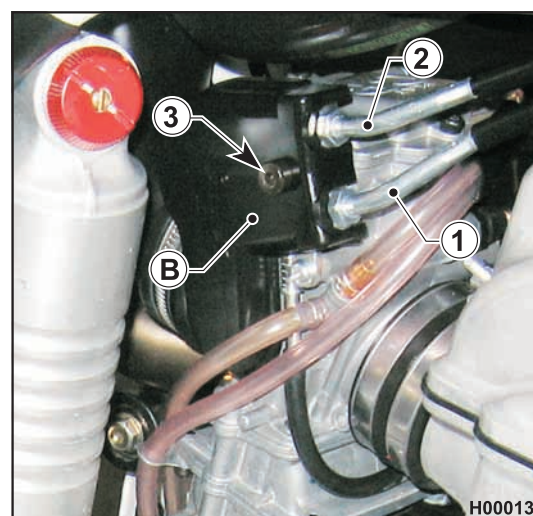
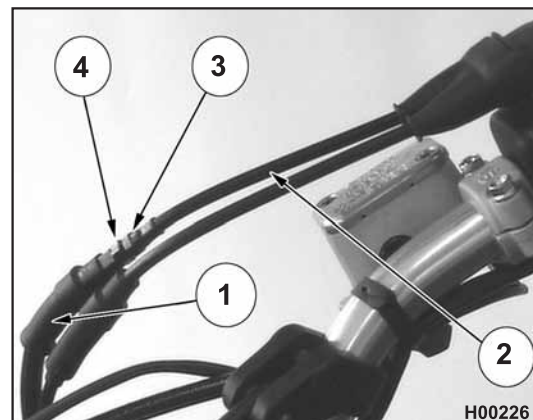


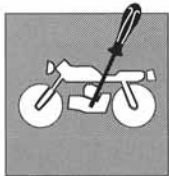
Operation with damaged throttle cable could result in an unsafe riding condition.



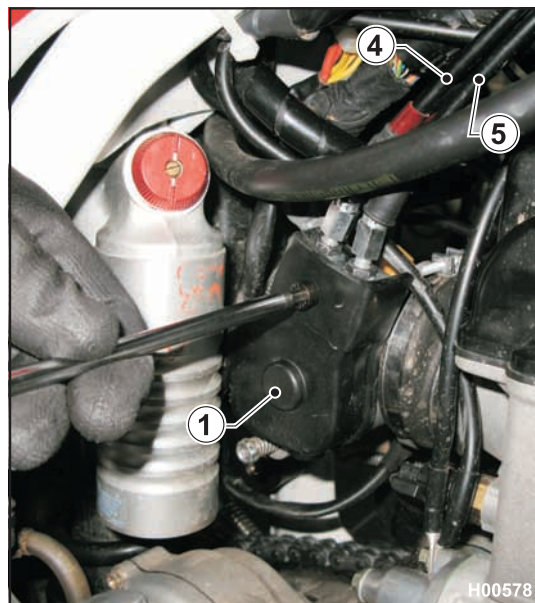
Exhaust gas contains poisonous carbon monoxide. Never run the engine indoors.

When replacing the throttle cables (1) and (2), make sure a 10-mm length of each cable protrudes over the clip (length A) as shown in the picture. Refit the protection cover (B) using the screw (3) and adjust the cables at handlebar end. To replace the cables, you will need to remove the fuel tank as described in the relevant paragraph.





SETTINGS AND ADJUSTMENTS



Throttle cable adjustment (TE - TXC)

To check the correct adjustment of the throttle cable, operate as follows:

- Loosen the screw and remove the cover (1).
- Make sure the cables protrude by 10 mm (length A). If they need adjusting, loosen the check nuts (2) and turn the adjuster screws (3). When finished, tighten the check nuts (2).
- Always check length "A" after replacing the cables (4) and (5).
- Refit the cover (1) and tighten the screw.

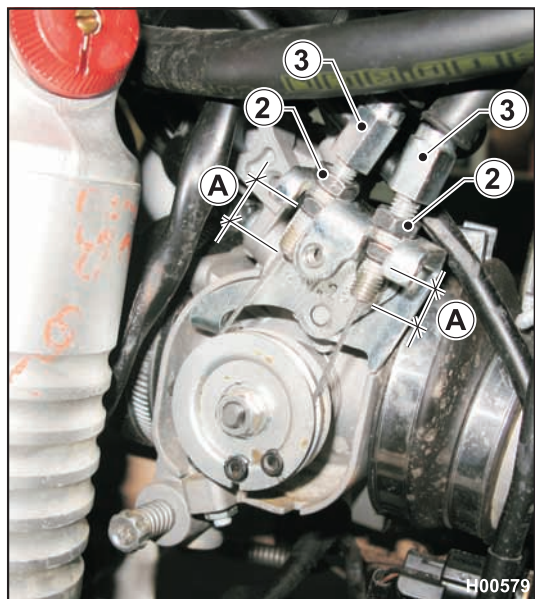


Operation with damaged throttle cable could result in an unsafe riding condition.



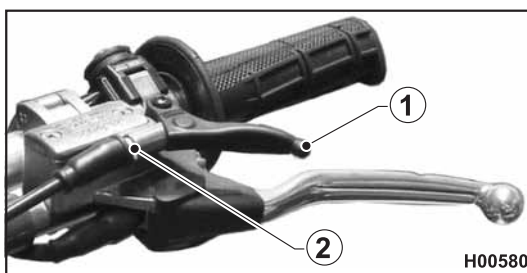
Exhaust gas contains poisonous carbon monoxide. Never run the engine indoors.

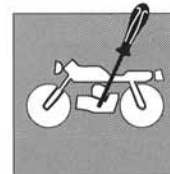
To replace the cables, you will need to remove the fuel tank as described in the relevant paragraph.



Enrichener lever play adjustment (TE - TXC)

The lever (1) holder features an adjuster screw (2) to adjust free play. Free play should be about 3 mm: if not so, loosen the check nut and turn the adjuster screw as required (loosen to decrease play or tighten to increase it).





Carburettor adjustment (TC)

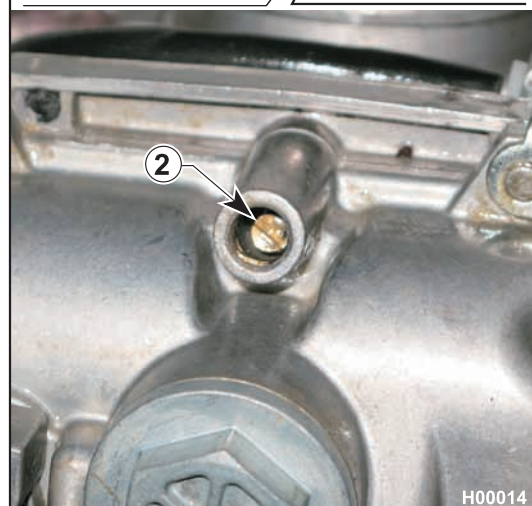
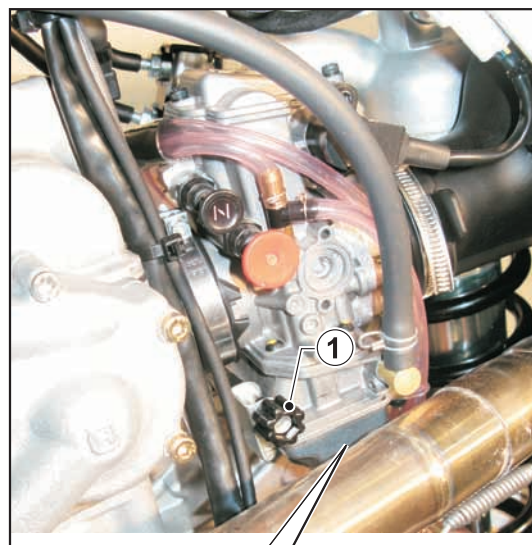
Adjust the carburettor with warm engine and with the throttle control in closed position. Proceed as follows:

- turn the idle speed adjuster screw (1) located on the left-hand side of the vehicle, until setting idle RPM quite high (turn clockwise to increase the speed and counter clockwise to reduce the speed).
- Turn the adjuster screw (2) clockwise to fully closed position, and then turn it back 1.5 turns.
- Gradually loosen the screw (1) until achieving suitable idle speed setting.

Idle adjustment (TC)

Adjust the carburettor with warm engine and with the throttle control in closed position. Proceed as follows:

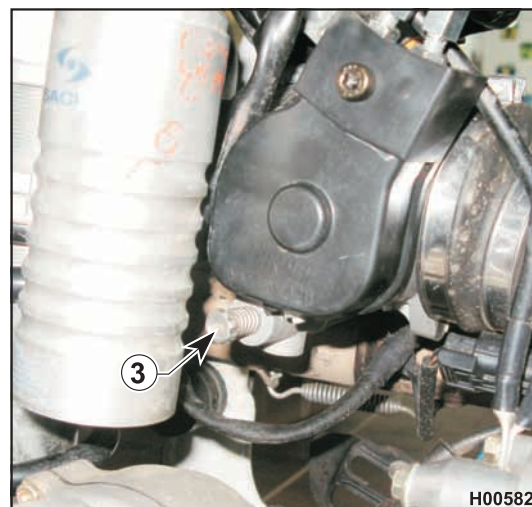
- Turn the idle speed adjuster screw (1) located on the left-hand side of the vehicle, until setting idle RPM as required (turn clockwise to increase the speed and counter clockwise to reduce it).

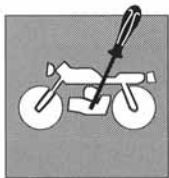


Idle adjustment (TE - TXC)

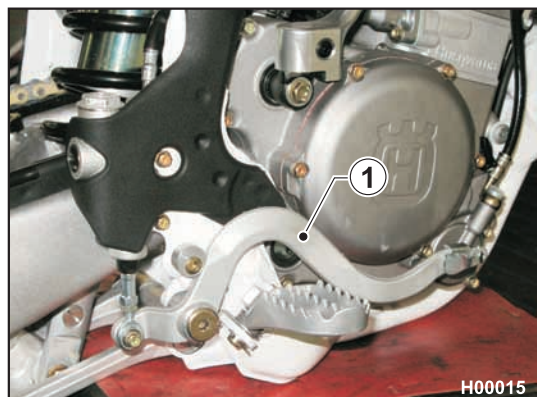
Adjust the carburettor with warm engine and with the throttle control in closed position. Proceed as follows:

- Turn the idle speed adjuster screw (3) located on the throttle body on the right-hand side of the vehicle, until setting idle speed to 1,600 RPM (turn clockwise to increase the speed and counter clockwise to reduce it).





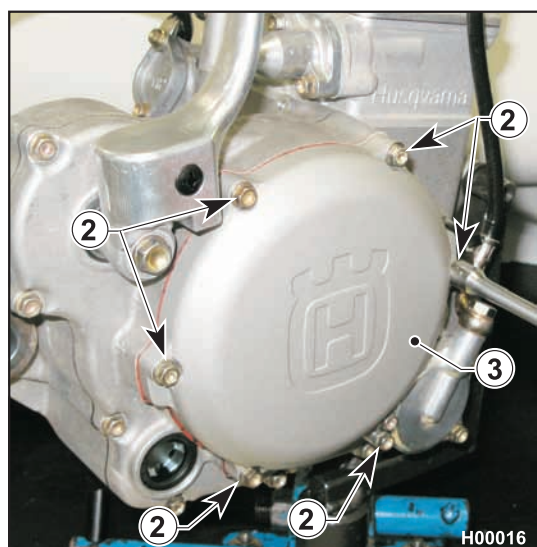
SETTINGS AND ADJUSTMENTS



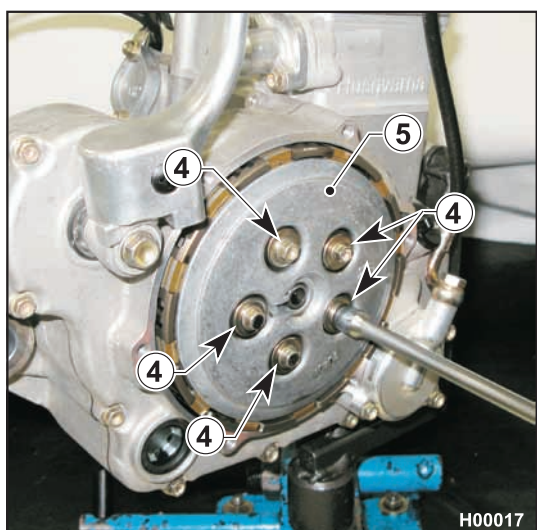
Clutch plate replacement

This procedure can be performed with the motorcycle leaning to the left - **there is no need to drain engine oil.**

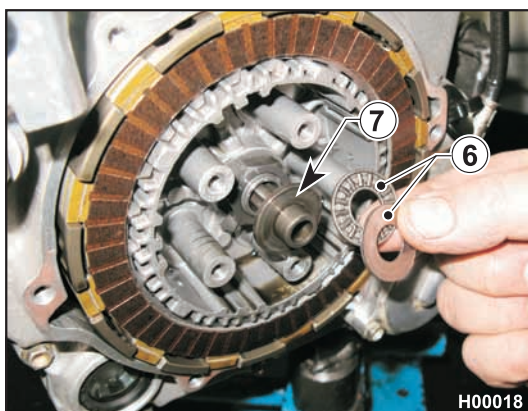
- Remove the brake pedal (1).



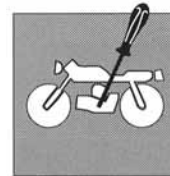
- Remove the six retaining screws (2) and the clutch cover (3).



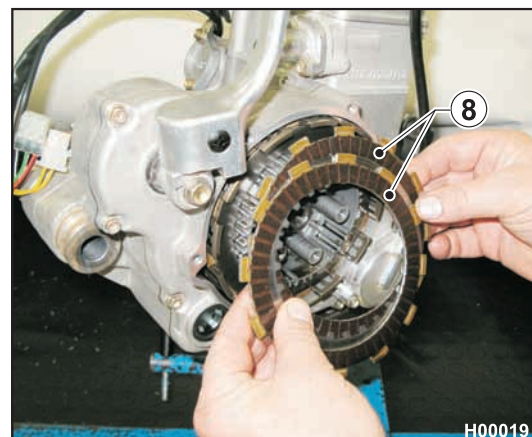
- Using an 8 mm wrench, unscrew the six screws (4) securing the clutch springs. Remove springs, pressure plate (5) with bearing (6) and clutch actuator plate (7).



SETTINGS AND ADJUSTMENTS



- Remove the plates (8), lubricate the new plates with engine oil and install them (always start with a friction plate).



Refit clutch actuator plate, bearing and pressure plate.

Tighten the spring screws gradually in a cross pattern (8 Nm - 0.8 Kgm - 5.8 ft/lb).

When refitting the clutch cover (8 Nm - 0.8 Kgm - 5.8 ft/lb), check gasket for wear and replace as required.



For additional information on assembly procedures, see Section "H" Engine assembly.

Hydraulic clutch lever adjustment and fluid level check

Free play (A) must be at least 0.1 in.

The lever position can be adjusted to suit the rider hand size.

To decrease the lever distance from the handgrip, rotate the adjuster (B) CLOCKWISE.

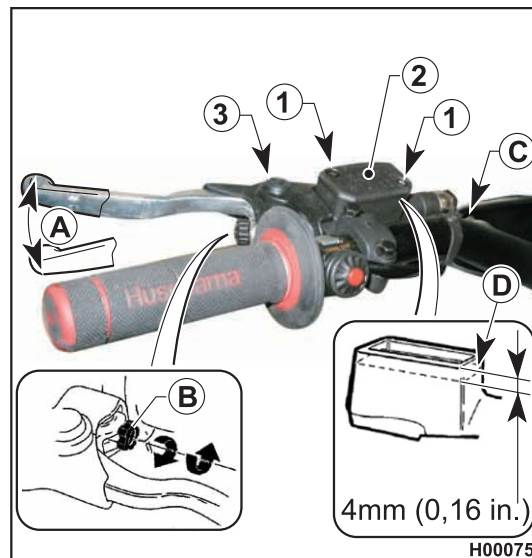
To increase the lever distance from the handgrip, rotate the adjuster (B) COUNTER CLOCKWISE.

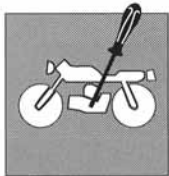
Fluid level is checked as follows:

- Remove screws (1), cover (2) and rubber diaphragm from the control;
- Keep the control cylinder (3) in a horizontal position and make sure that fluid level has not dropped lower than 4 mm (0.16 in.) below the upper edge (D) of master cylinder body;
- If needed, top up with the fluid specified in the LUBRICANT CHART included in Section "A".

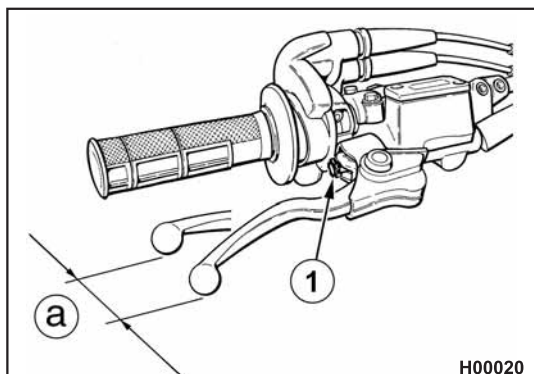
Refit any parts you have removed.

Periodically check the connecting hose (see "Scheduled Maintenance Chart"); if hose (C) is worn or cracked, its replacement is advised.





SETTINGS AND ADJUSTMENTS



Front brake lever adjustment and fluid level check

The adjuster (1) located on the control lever, allows adjusting of the free play (a). Free play (a) must be at least 3 mm.

The level of the fluid in master cylinder reservoir must never be below the minimum value (2), which can be checked from the inspection window on the rear of the master cylinder body. A decrease of the fluid level will let air into the system, hence an extension of the lever stroke.



If the brake lever feels mushy when pulled, there may be air in the brake line or the brake may be defective: **CHECK THE BRAKING SYSTEM** (see Section "L").



Too much brake lever free play may reduce braking action: **CHECK BRAKE PAD THICKNESS** (see Section "L").



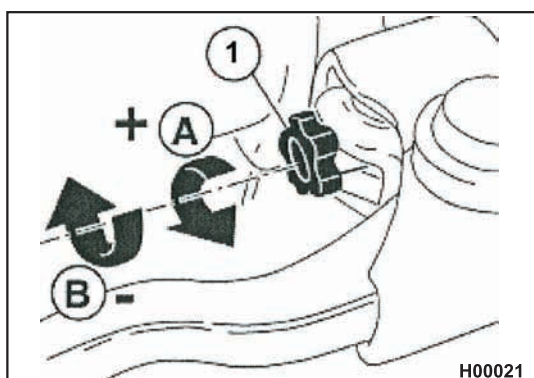
Do not spill brake fluid onto any painted surface or lens (for example lights lens).



Do not mix two brands of fluid. Completely change the brake fluid in the brake system if you wish to switch to another fluid brand.



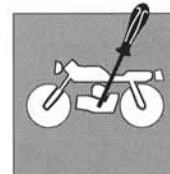
Brake fluid may cause irritation. Avoid contact with skin or eyes. In case of contact, flush thoroughly with water and call a doctor if your eyes were exposed.



A: to increase clearance

B: to decrease clearance





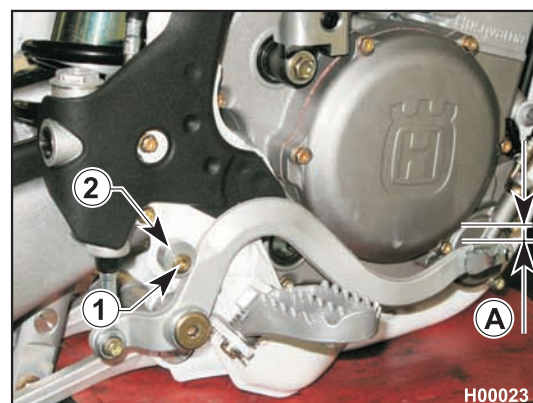
Rear brake pedal position adjustment

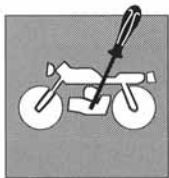
The position of the rear brake pedal with respect to the footrest may be adjusted according to individual needs.

For adjusting, proceed as follows:

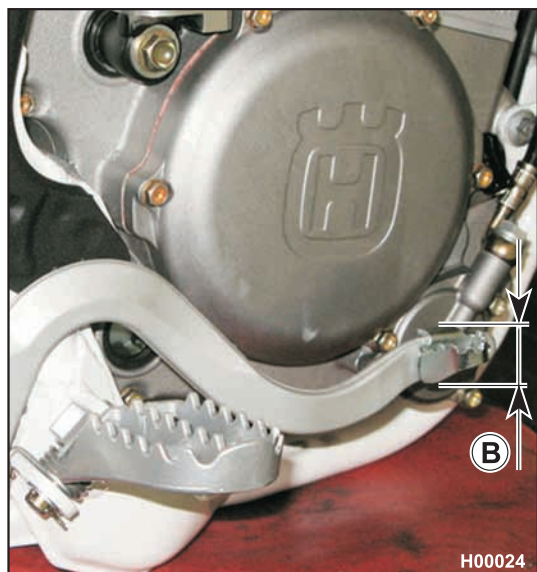
- Loosen the screw (1).
- Turn the cam (2) in order to raise or lower the brake pedal within the range available (A).
- When finished, tighten the screw (1).

Once this adjustment is completed, adjust the free play of the pedal following the instructions provided in paragraph "Rear brake pedal free play adjustment".





SETTINGS AND ADJUSTMENTS



Rear brake pedal free play adjustment

The rear brake pedal should have 5 mm free play (B) before the brake begins to bite. Should this not happen, operate as follows:

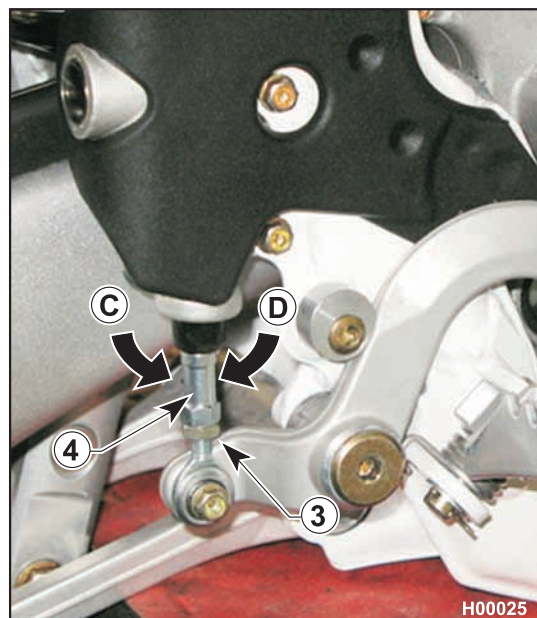
- Loosen the nut (3);
- Operate the master cylinder linkage (4) to increase or decrease free play;
- Tighten the nut (3) at the end of the operation.



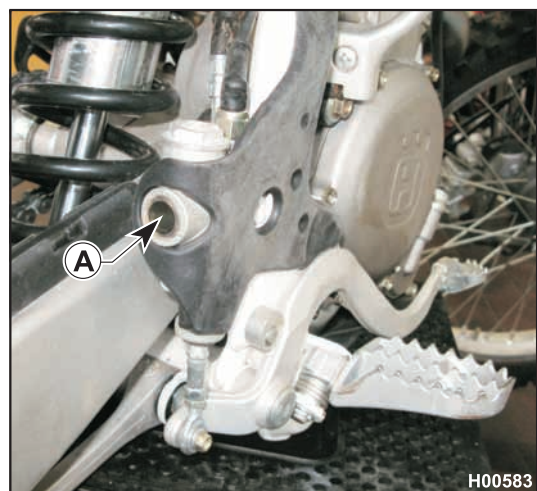
When the free play requirement is not met, the brake pads will be subjected to an early wear that may lead to TOTAL BRAKE INEFFECTIVENESS.



If the brake pedal feels mushy when pulled, there may be air in the brake line or the brake may be defective. CHECK THE BRAKING SYSTEM (see Section L).



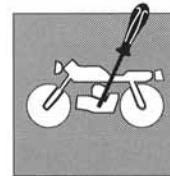
C: to increase clearance
D: to decrease clearance



Rear brake fluid level check

Level (A) must be between the MIN and MAX notches visible on the master cylinder reservoir.





Engine oil level check

Keeping the motorcycle level and upright, check the oil level through the inspection window (1) on the right crankcase.

Make sure level is up to window midline (1).

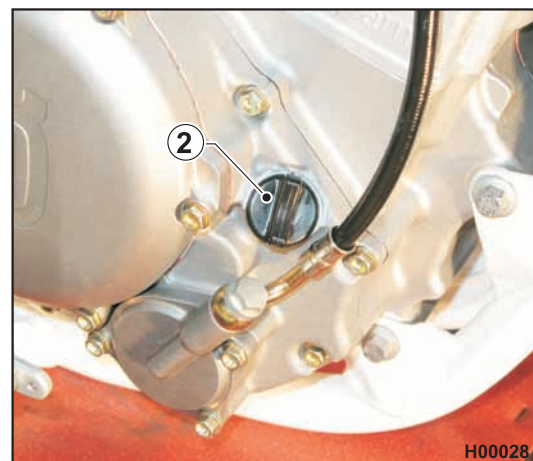
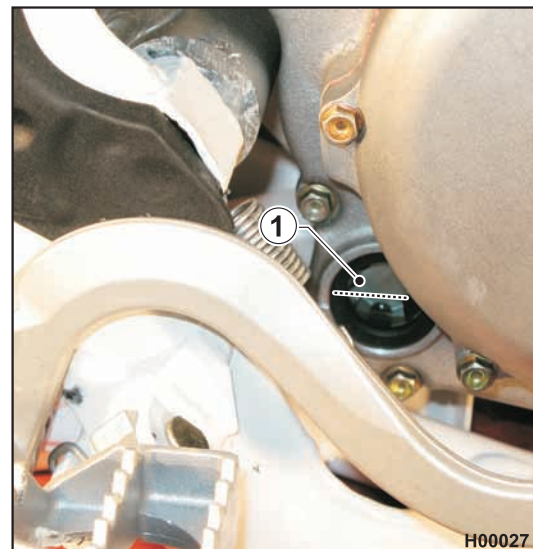
To top up, remove the filler cap (2).

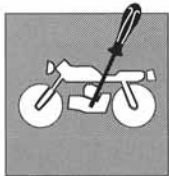


Have this operation made with warmed-up engine.

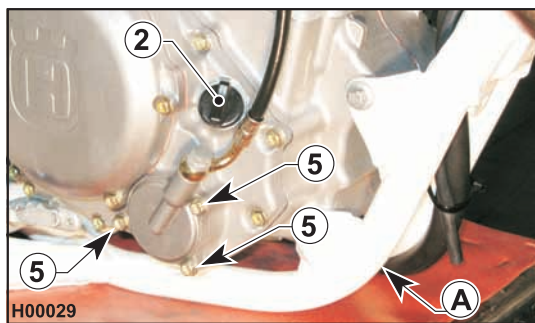


Be careful not to touch hot engine oil.





SETTINGS AND ADJUSTMENTS



Engine oil replacement and mesh filters-filter cartridge cleaning or replacement

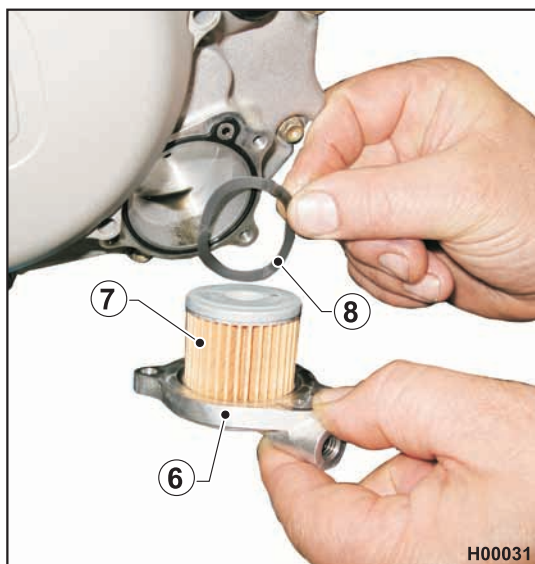
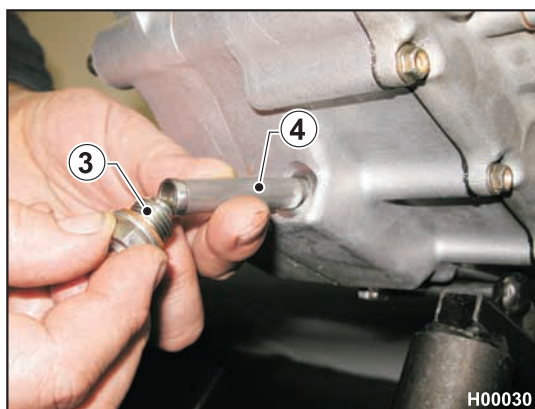
Drain the oil with WARM ENGINE; proceed as follows:

- Remove the oil filler cap (2).
- The oil sump guard (A) may be left in place. However, the procedure will be easier with the guard removed.
- Place an oil drain pan under the engine.
- Remove oil drain plug (3) and filter (4), drain the oil and clean the plug magnet.
- Wash the filter (4) with petrol and refit it into its seat.
- Unscrew the screws (5) and remove cover (6) together with filter (7).
- Change the filter (7) and refit the assembly making sure to fit the Belleville washer (8) in the correct position.
- Refit the drain plug (3) (25 Nm - 2.5 Kgm - 33.89 ft/lb) and the oil sump guard (A).
- Fill with the specified quantity of oil.

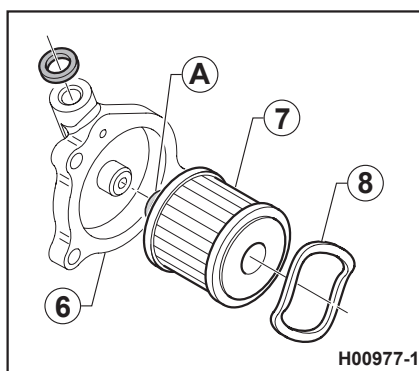
For recommended oil type and quantity, see "Capacities" table in Section "A".

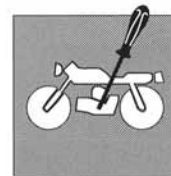


Be careful not to touch hot engine oil.



WARNING When assembling filter to cover, make sure to fit the filter oil seal (A) first onto the cover (6).





Coolant level check

Check level (1) in right-hand radiator when engine is cold (place the motorcycle so that it is perpendicular to the ground). The coolant should be approximately 0.39 in. above the cells.

The radiator cap features two locking positions: the first one is for prior discharge of pressure from the cooling system.



Avoid removing radiator cap when engine is hot, as coolant may spout out and cause scalding.



TE-TXC: Because the cooling fan (V) can be activated even when the start switch is in OFF position, always keep at a safe distance from the fan blades.



Difficulties may arise in eliminating coolant from painted surfaces. If this occurs, wash off with water.

Coolant replacement

Place a vessel on the L.H. side of the cylinder, under the hose (1).

Remove the drain hose (A) as follows:

- Unscrew the two screws (C);
- Release the spring (D).

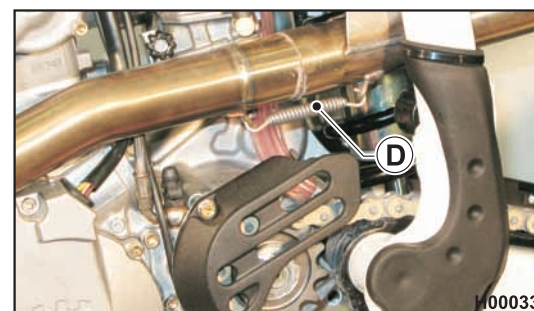
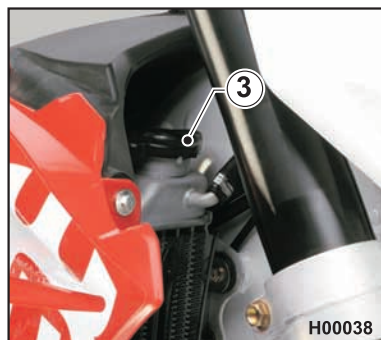
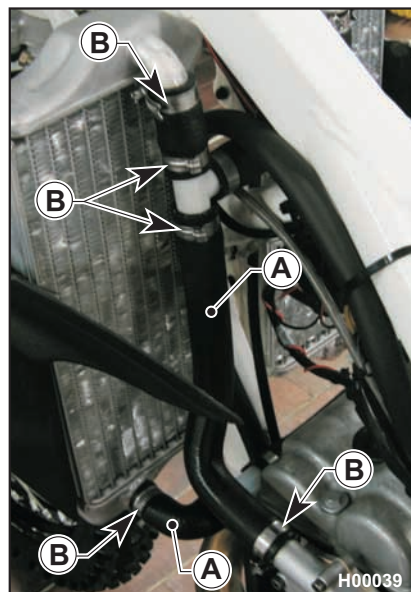
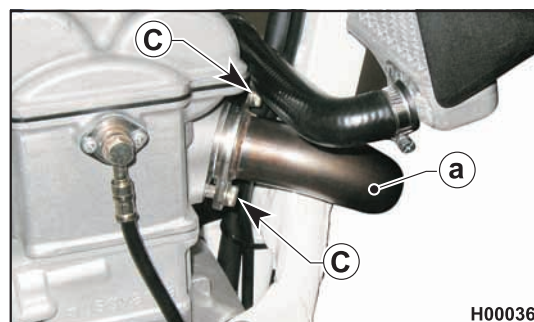
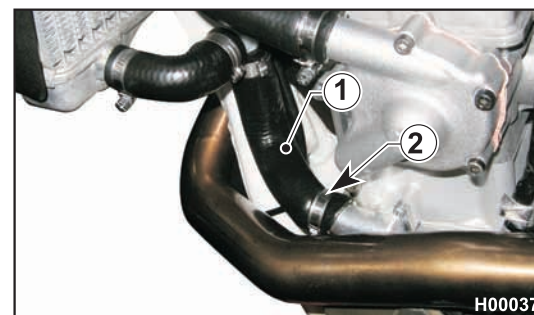
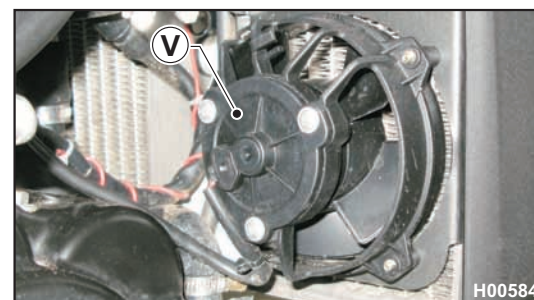
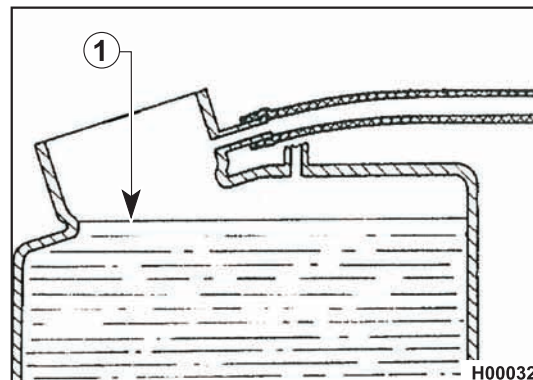
Loosen the clamp (2) on the hose (1) and detach the hose from the engine. SLOWLY open the cap (3) of the right-hand radiator and lean the motorcycle to the left to let the coolant drain into the vessel.

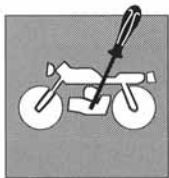
When finished, refit the hose (1) and secure it with the clamp (2). Refit the drain hose.

Pour the necessary quantity of coolant in the radiator then warm up the engine in order to eliminate any possible air bubbles.

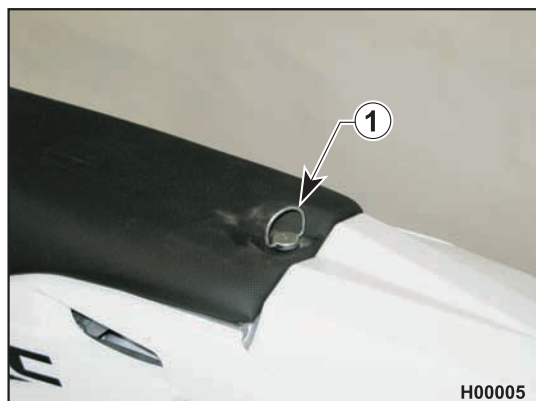
Periodically check the connecting hoses (see "Scheduled Maintenance Chart"): this will avoid coolant leakage and consequent engine seizure. If hoses (A) show cracks, swelling or hardening due to sheaths desiccation, their replacement shall be advisable.

Check the correct tightening of the clamps (B).





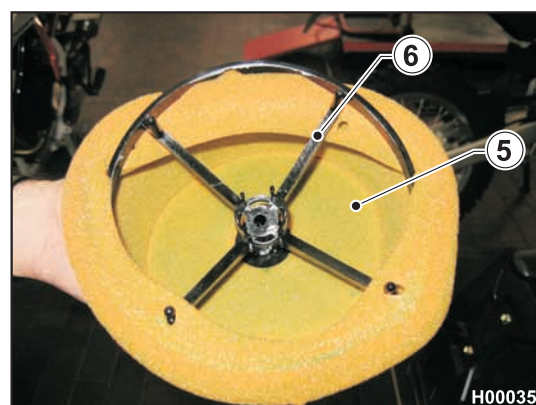
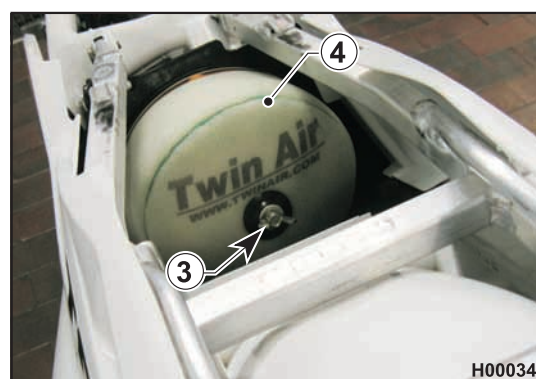
SETTINGS AND ADJUSTMENTS

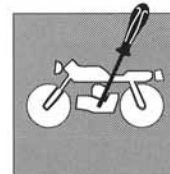


Air filter check (TC)

Turn the rear fixing (1) counter clockwise, remove it and extract the saddle releasing it from the front retaining screw.

Remove the screw (3), remove the complete air filter (4) and separate filter (5) from rear chassis (6).





Air filter check (TE - TXC)

Turn the rear fixing (1) counter clockwise, remove it and extract the saddle releasing it from the front retaining screw.

Take out the battery (A) and leave it hanging on the side of the motorcycle.

Remove the screw (3), remove the complete air filter (4) and separate filter (5) from intake silencer (6).

Air filter cleaning

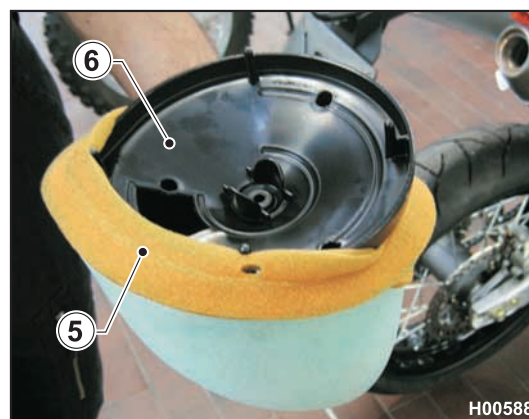
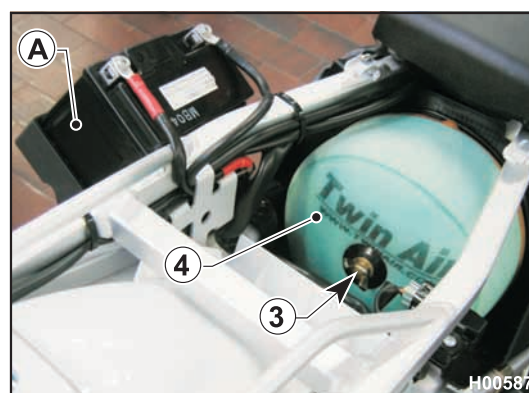
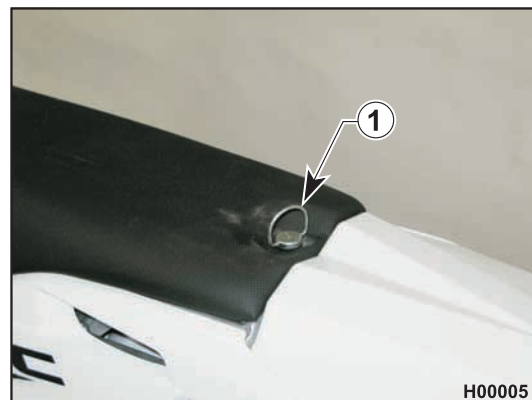
Wash the filter with a specific detergent (see "Capacities" table in Section A) then dry it fully (wash filter with gasoline only in case of need). Plunge the filter in special oil for filters (see "Capacities" table in Section A), then wring it to drain superfluous oil.

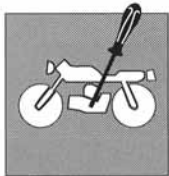


Do not use fuel or a low flash-point solvent to clean the filtering element. A fire or explosion could result.

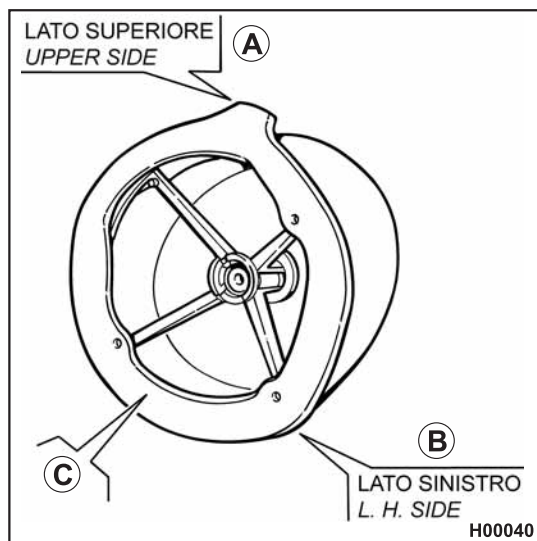


Clean the filtering element in a well ventilated area and do not allow sparks or flames anywhere near the working area.





SETTINGS AND ADJUSTMENTS



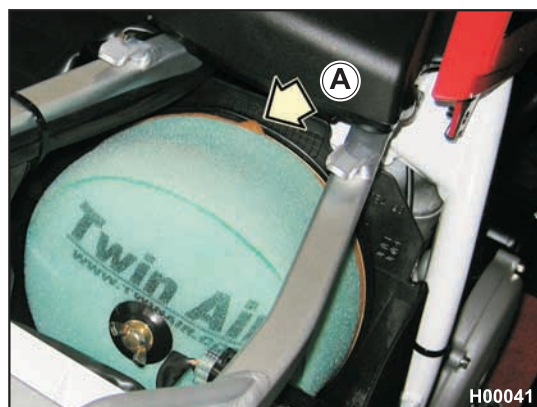
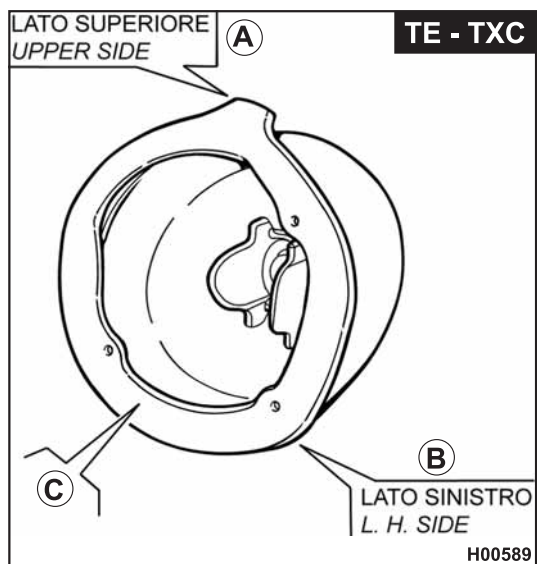
Assembly

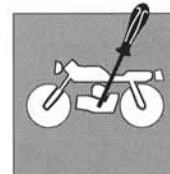
Grease the edge (C) of the filter face that goes into the housing to ensure proper sealing. When refitting the filter into its housing, make sure to position it with the tab (A) pointing upwards and edge (B) at the left bottom corner of the filter housing. Refit any parts you have removed.



An improperly positioned filter might let dirt or dust into the engine, leading to early wear of piston rings and cylinder.

A = Upper side
B = Left-hand side





Secondary drive chain adjustment

Chain should be checked, adjusted and lubricated as per the "Maintenance Chart" (see Section B) to ensure safety and prevent excessive wear. If the chain becomes badly worn or is poorly adjusted (i.e., if it is too loose or too taut), it could escape from sprocket or break. To adjust chain tension, you need to lower the rear end of the motorcycle so as to bring the axes of rotation of sprocket, swinging arm and rear wheel into alignment as shown in figure "A", and then turn the rear wheel three turns. In this condition, the chain should be neither taut nor slack. (Fig. A).

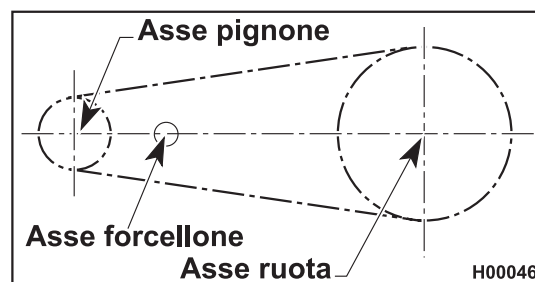


Fig. A

Asse pignone = Sprocket axis

Asse forcellone = Swinging arm axis

Asse ruota = Wheel axis

Quick adjustment (Fig. B)

Insert a 35 mm socket (a) (or a shim of the same size) at the position shown in the figure and check that the lower section (C) of the chain is slightly taut.

If it is not, proceed as follows:

- Loosen the wheel axle nut (1) on the right-hand side using a 27 mm socket wrench;
- Loosen the check nuts (2) on both chain tensioners with a 12 mm wrench and work the screws (3) until achieving the correct tension;
- When the adjustment is completed, tighten the check nuts (2) and the wheel axle nut (1).

After any adjustment, always check wheel alignment and tighten wheel axle securely (142.1 Nm - 14.5 Kgm - 104.8 ft/lb).

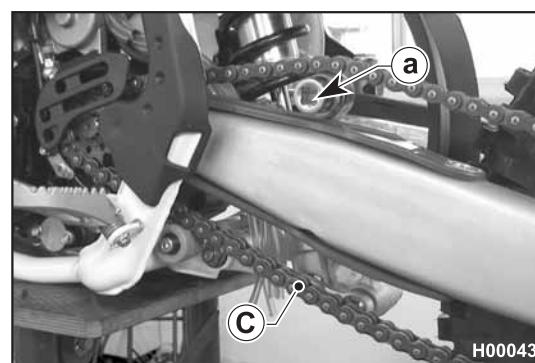
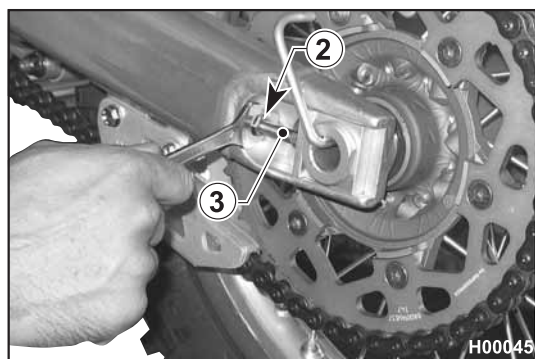
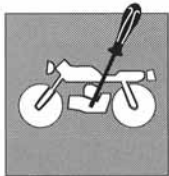


Fig. B





SETTINGS AND ADJUSTMENTS



Chain lubrication

Lubricate the chain following these instructions.



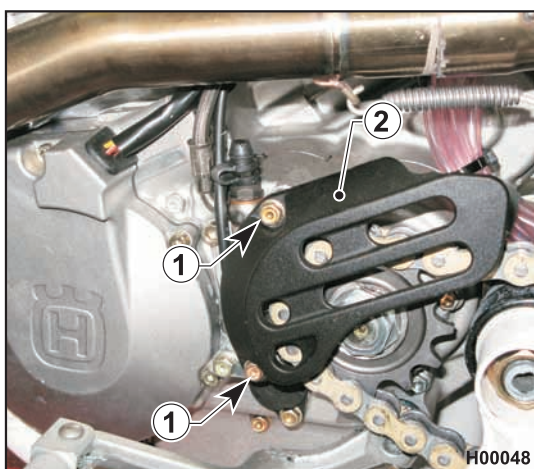
Never use grease to lubricate the chain. Grease helps to accumulate dust and mud, which act as abrasive and help to rapidly wear out the chain, the front and rear sprockets.

Disassembling and cleaning

When particularly dirty, remove and clean the chain before lubrication. Proceed as follows:

- Set a stand or a block under the engine and see that the rear wheel is lifted from the ground.
- Remove: screws (1), sprocket guard (2), clip (3), master link (4) and chain (5). To reassemble, reverse the above procedure.

Make sure that the chain is neither worn out nor damaged. If the rollers or the links are damaged, replace the chain by following the instructions given in the Scheduled Maintenance Chart. Ensure that the sprockets are not damaged. Wash and clean the chain as described hereunder.



Washing a chain without O-rings

Wash using petroleum or naphtha. If you use fuel or especially trichloroethylene, dry and lubricate the chain to avoid oxidation.

Lubricating a chain without O-rings

After drying, dip the chain in Molybdenum Disulphide chain lubricant, if possible, or in warm high-viscosity engine oil (if warmed up, oil will be more fluid).

Lubricating an O-ring chain

Lubricate all metallic and rubber (O-ring) elements using a brush and engine oil with SAE 80-90 viscosity, inside and outside parts.

Assemble the master link clip (3) by setting the closed side facing the chain direction of rotation, as shown in the figure.



The master link is the most critical safety part in the drive chain. Even if the master links are reusable when in good conditions, for safety purposes we advise using a new master link when reassembling the chain. Accurately adjust the chain as described on page D.18.



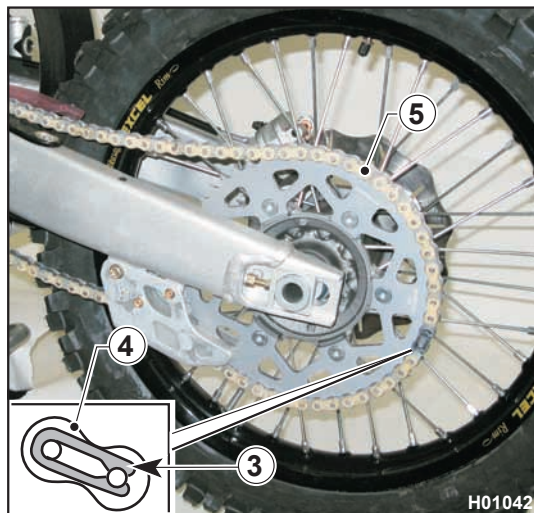
The chain lubricant shall NEVER get in contact with the tyres or the rear brake disc.

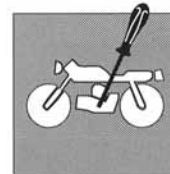


Chain guide roller, chain guide roller, chain guide, chain slider
Check the wear of the above-mentioned elements and replace them when necessary.



Check the chain guide alignment, and remember that a bent element can cause chain early wear. In this case, chain might unwrap from the sprocket.





Suspension setup according to track condition

Following are a few guidelines to find the right suspension setup for different types of terrain. Always start from the suspensions standard setting before making any change. Afterwards, increase or decrease the adjusting clicks, one at a time.

HARD GROUND

Front fork: softer compression setting.

Shock absorber: softer compression setting.

For fast tracks, a softer compression and rebound setting both front and rear will give more grip.

SANDY GROUND

Front fork: set compression harder, or replace the standard spring with a harder spring and set the compression softer and the rebound harder.

Shock absorber: harder compression, and especially harder rebound settings.

Work on the spring preload to lower the motorcycle riding height (rear end).

MUDDY GROUND

Front fork: set compression harder, or replace the standard spring with a harder spring.

Shock absorber: harder compression and rebound settings

or replace the standard spring with a harder spring. Work on the spring preload to lift the motorcycle riding height (rear end). Changing the springs front and rear is advised in order to compensate for increased motorcycle weight due to caked-on mud.

NOTES

If the fork remains too soft or too hard no matter what setting you choose, check oil level in the fork tubes, as it might be too low or too high. Remember that the more oil you add, the more frequently you will need to bleed the forks. If changes to suspension settings take no effect, check the adjuster assemblies, as they might be stuck.

Standard settings, available replacement springs and adjusting procedures are outlined in the following pages.

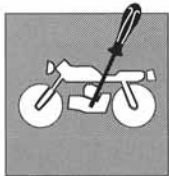


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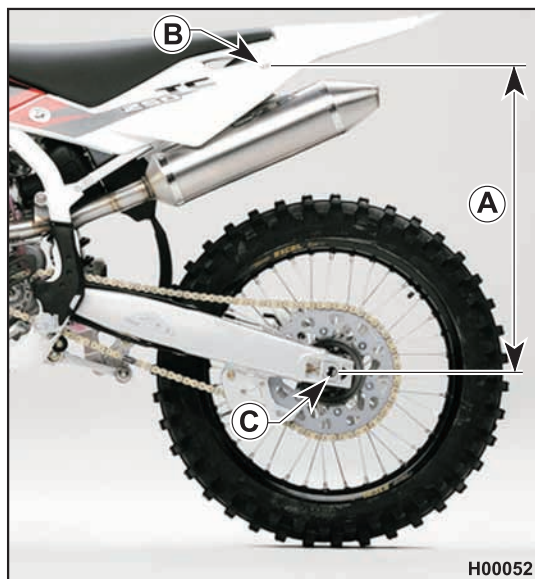


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SETTINGS AND ADJUSTMENTS



B: panel retaining screw axis
C: rear wheel axle height

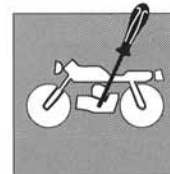
Shock absorber adjustment

The rear shock absorber must be adjusted to suit rider weight and terrain conditions.

Proceed as follows:

1. Place the motorcycle on the stand and measure distance (A).
2. Sit on the motorcycle in normal riding position with full riding gear on.
3. Have someone else measure distance (A) again.
4. The difference between these two measurements is the distance the rear end settles when the rider sits on the motorcycle (RIDER SAG). Recommended rider sag is 100 mm with a cold shock absorber and 95 mm with a warm shock absorber.
5. To achieve correct rider sag for your weight, adjust the spring preload of the shock absorber (see relevant paragraph).





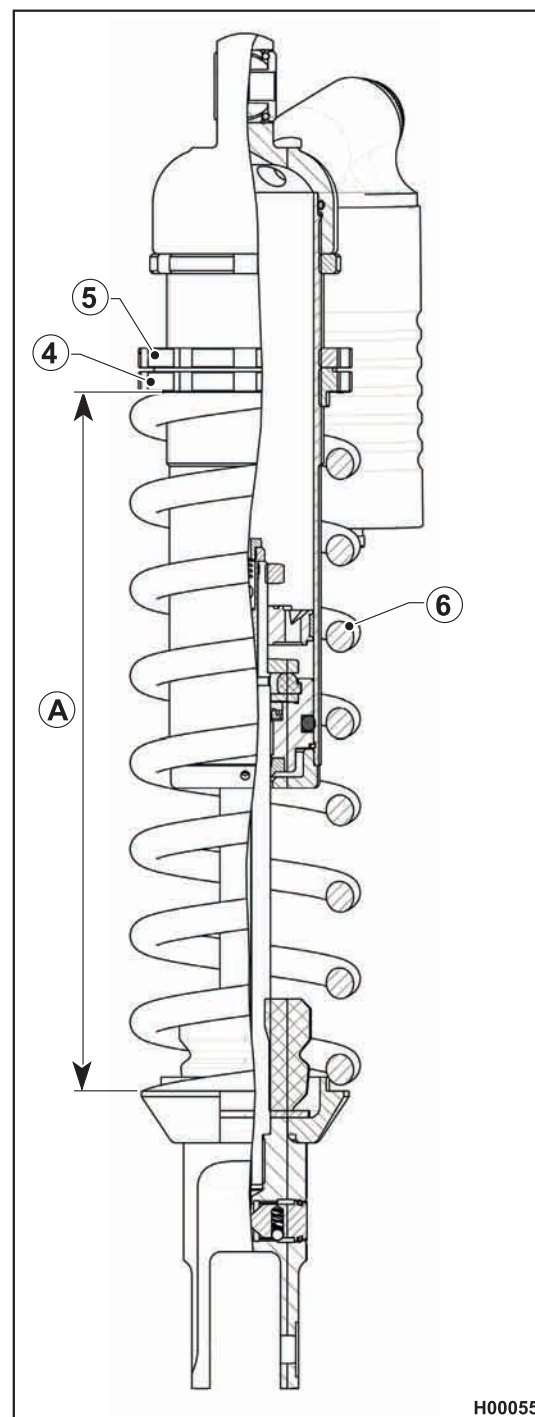
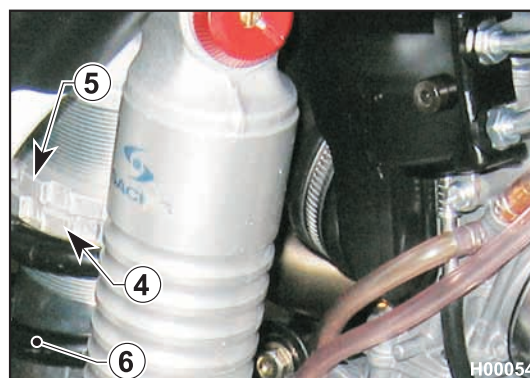
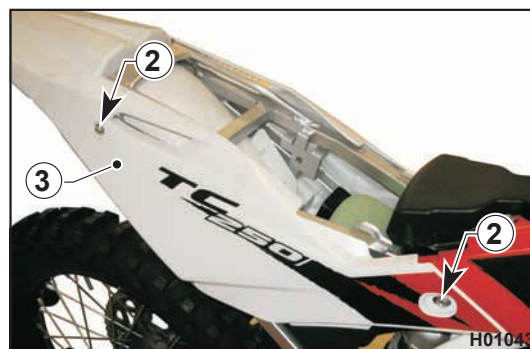
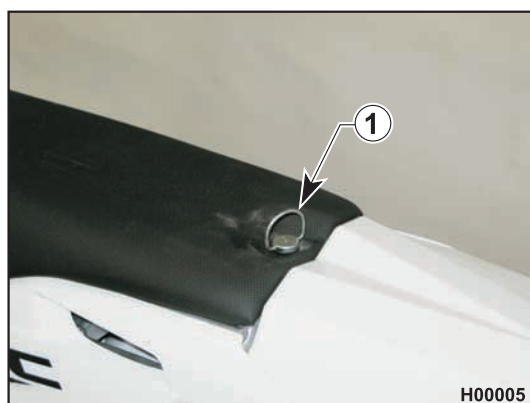
Shock absorber spring preload adjustment

Proceed as follows:

1. Turn the rear fixing (1) counter clockwise and remove the saddle, unscrew the retaining screws (2) and remove the right-hand side panel (3).
2. Clean lock ring nut (4) and adjuster ring nut (5) of the spring (6).
3. Either with a hook wrench or an aluminium punch, loosen the lock ring nut.
4. Turn the adjuster ring nut as required.
5. Adjust preload to suit your weight or riding style and tighten the lock ring nut firmly (tightening torque 50 Nm - 5 Kgm - 67.8 ft/lb).
6. Reassemble the R.H. side panel and the saddle.



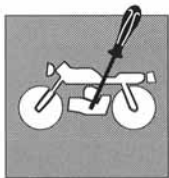
Be careful not to touch hot exhaust pipe while adjusting the shock absorber.



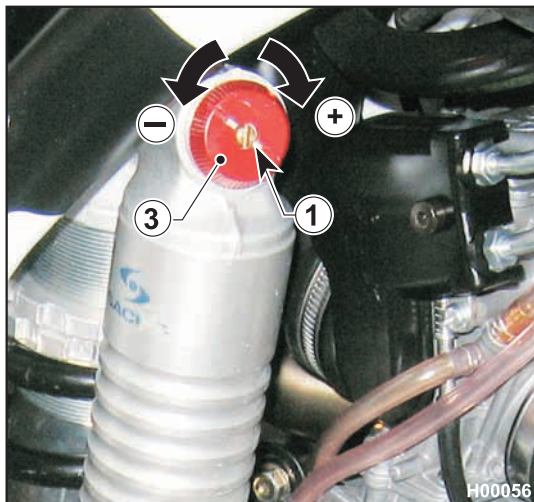
The standard length of the preloaded spring is as follows:

TC: A= 250 ± 1.5 mm
TE: A= 247 ± 1.5 mm
TXC: A= 250 ± 1.5 mm





SETTINGS AND ADJUSTMENTS



Shock absorber compression and rebound damping adjustment

Adjustment of the compression stroke is independent from the rebound stroke.

A) COMPRESSION - Standard setting:

1) Low damping speed:
-15 clicks (± 2 clicks)
(adjuster 1)

2) High damping speed:
-15 clicks (± 2 clicks)
(adjuster 3)

To reset the standard setting, turn upper adjusters (1) and (3) clockwise until reaching fully closed position. Then turn them back the number of clicks specified above.

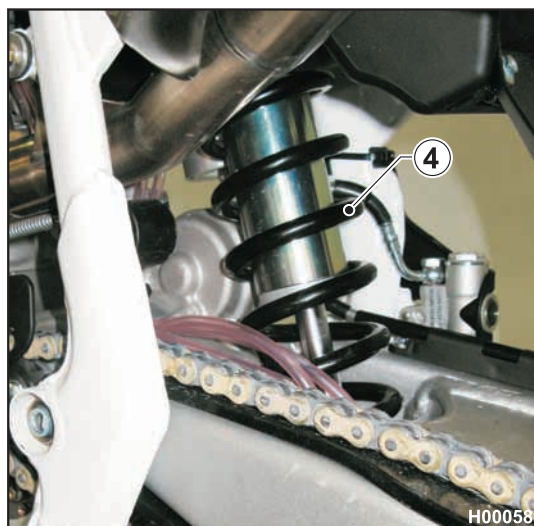
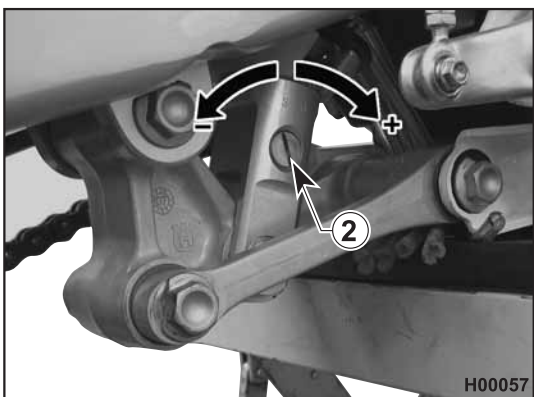
In order to obtain a smooth braking efficiency, turn the adjusters counter clockwise. Vice versa to obtain a harder braking action.

B) REBOUND - Standard setting:

-18 clicks (± 2 clicks)

To reset the standard setting, turn lower adjuster (2) clockwise until reaching fully closed position. Then turn it back by the mentioned clicks.

In order to obtain a smooth braking action, turn the adjuster counter clockwise. Vice versa to obtain a harder braking action.



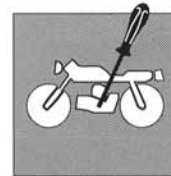
Shock absorber springs (4)

STANDARD

K=5.4 kg/mm (part no. 8000 98504) (TC + TXC)

K=5.2 kg/mm (part no. 8000 98569) (TE)

SETTINGS AND ADJUSTMENTS



MARZOCCHI front fork adjustment (TC 2009)

a) COMPRESSION (LOWER ADJUSTER)

Standard setting: -20 clicks.

To reset the standard setting, remove cap (B) and turn the adjuster (A) clockwise until reaching fully closed position. Then turn it back by the mentioned clicks. In order to obtain a smooth braking action, turn the adjuster counter clockwise. Vice versa to obtain a harder braking action.

b) REBOUND (TOP ADJUSTER)

Standard setting: -20 clicks.

To reset standard setting, turn adjuster (C) clockwise to reach the fully closed position; then, turn it back by the mentioned clicks. In order to obtain a smooth braking action, turn the adjuster counter clockwise. Vice versa to obtain a harder braking action.

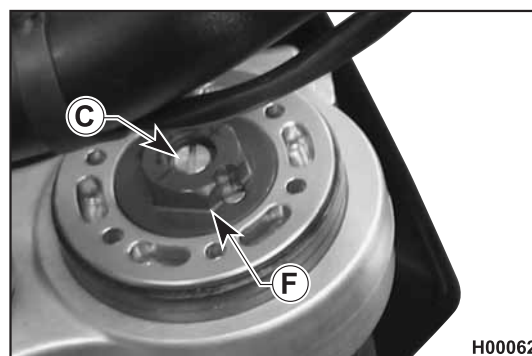
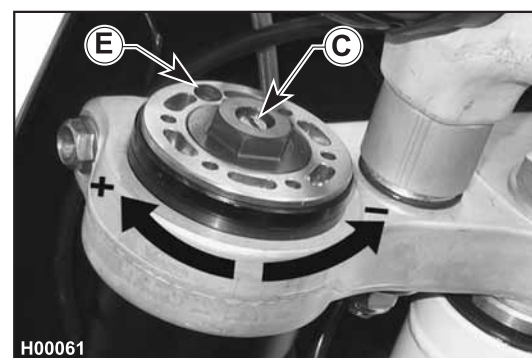
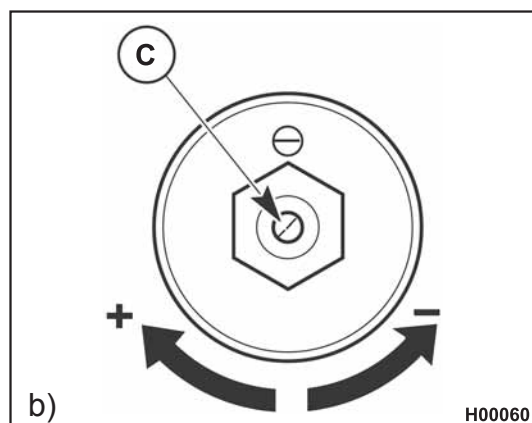
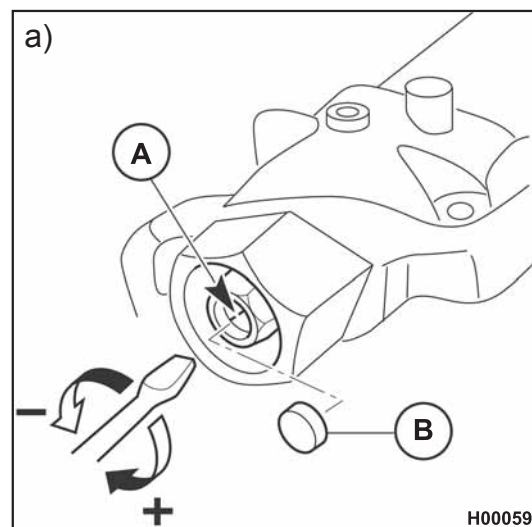
c) BLEEDING (to carry out after each competition, or monthly).

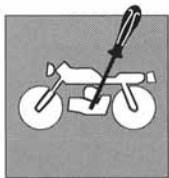
Set the motorcycle on a central stand, release the fork fully extended, remove cap (E) and push the bleed valve (D) in with the tip of a pointed tool. Refit the cap.



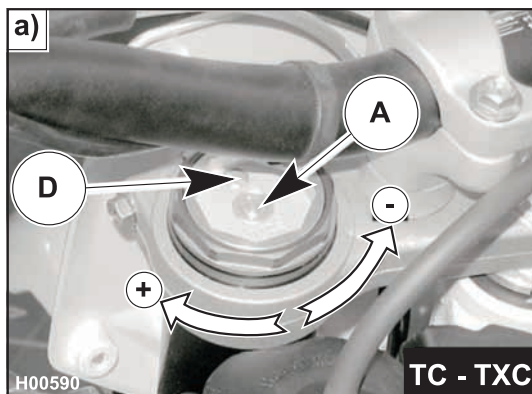
NEVER loosen the screw (F).

NOTE: Never force the adjuster screws beyond the maximum open and closed positions.





SETTINGS AND ADJUSTMENTS



KAYABA front fork adjustment (TC - TE - TXC / 2010)

- COMPRESSION (Fig. a)
(TC - TXC: TOP ADJUSTER; TE: LOWER ADJUSTER)

KAYABA: -13 clicks (TC - TXC / 2010);

KAYABA: -10 clicks (TE / 2010);

To reset the standard setting, turn cap nut (A) clockwise to reach the fully closed position; then, turn it back by the mentioned clicks. In order to obtain a smooth braking action, turn the adjuster counter clockwise. Vice versa to obtain a harder braking action.

- REBOUND (Fig. b)
(TC - TXC: LOWER ADJUSTER; TE: TOP ADJUSTER)

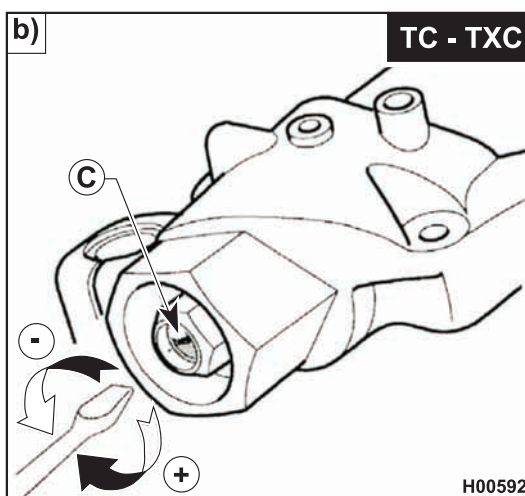
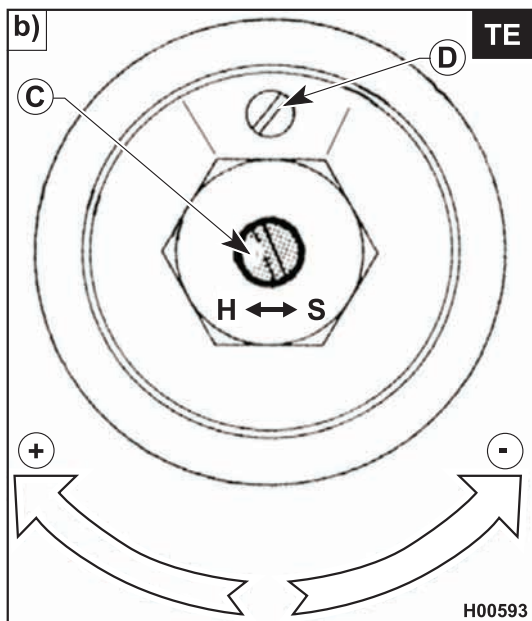
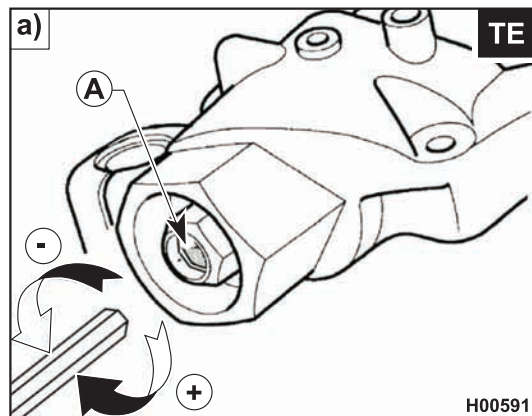
KAYABA: -9 clicks (TC - TXC / 2010);

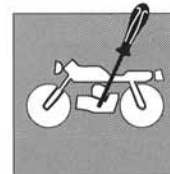
KAYABA: -10 clicks (TE / 2010).

To reset standard setting, turn adjuster (C) clockwise to reach the fully closed position; then, turn it back by the mentioned clicks. In order to obtain a smooth braking action, turn the adjuster counter clockwise. Vice versa to obtain a harder braking action.

- BLEEDING (Fig. a/b) (to carry out after each competition, or monthly).
Set the motorcycle on a central stand, release the fork fully extended and loosen the bleed valve (D). Once this operation is over, tighten the valve.

NOTE: Never force the adjuster screws beyond the maximum open and closed positions.

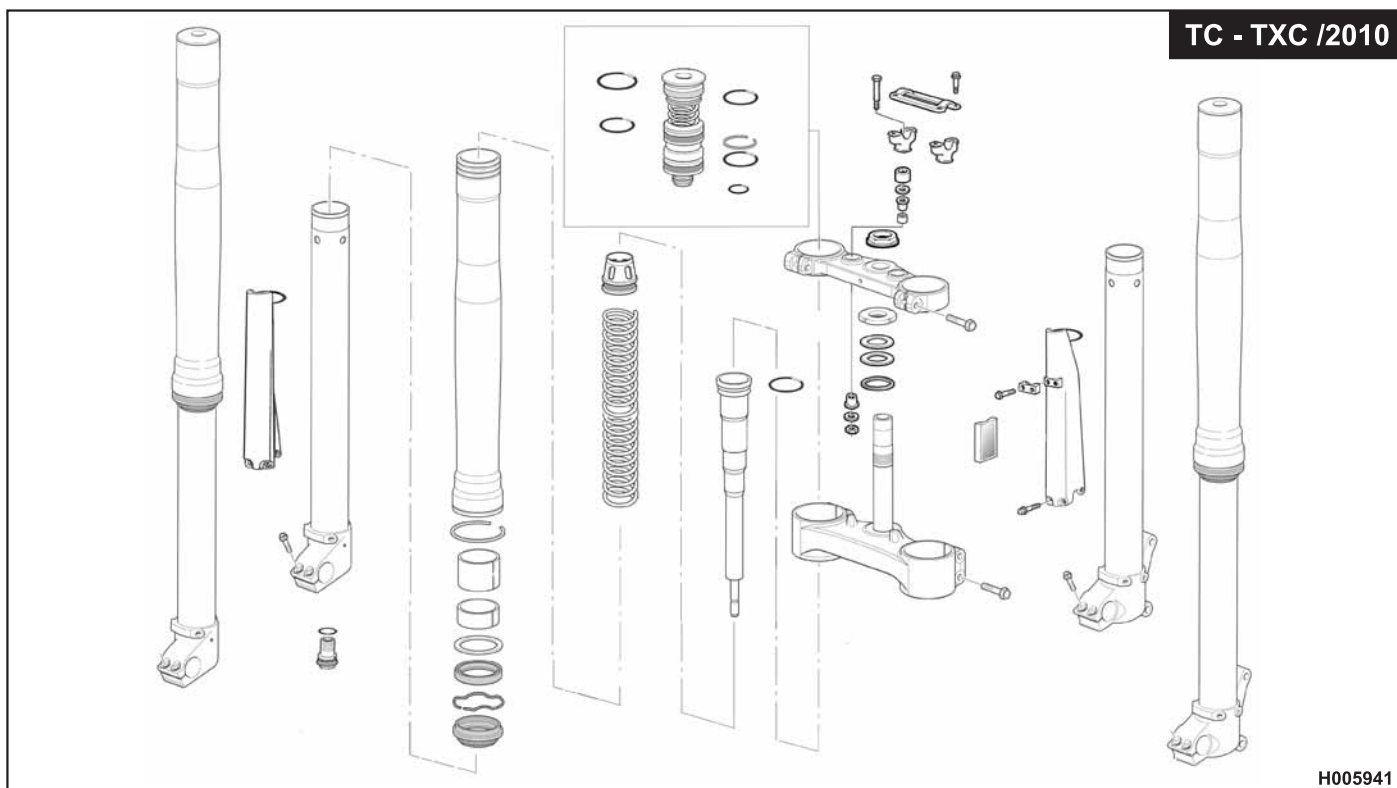




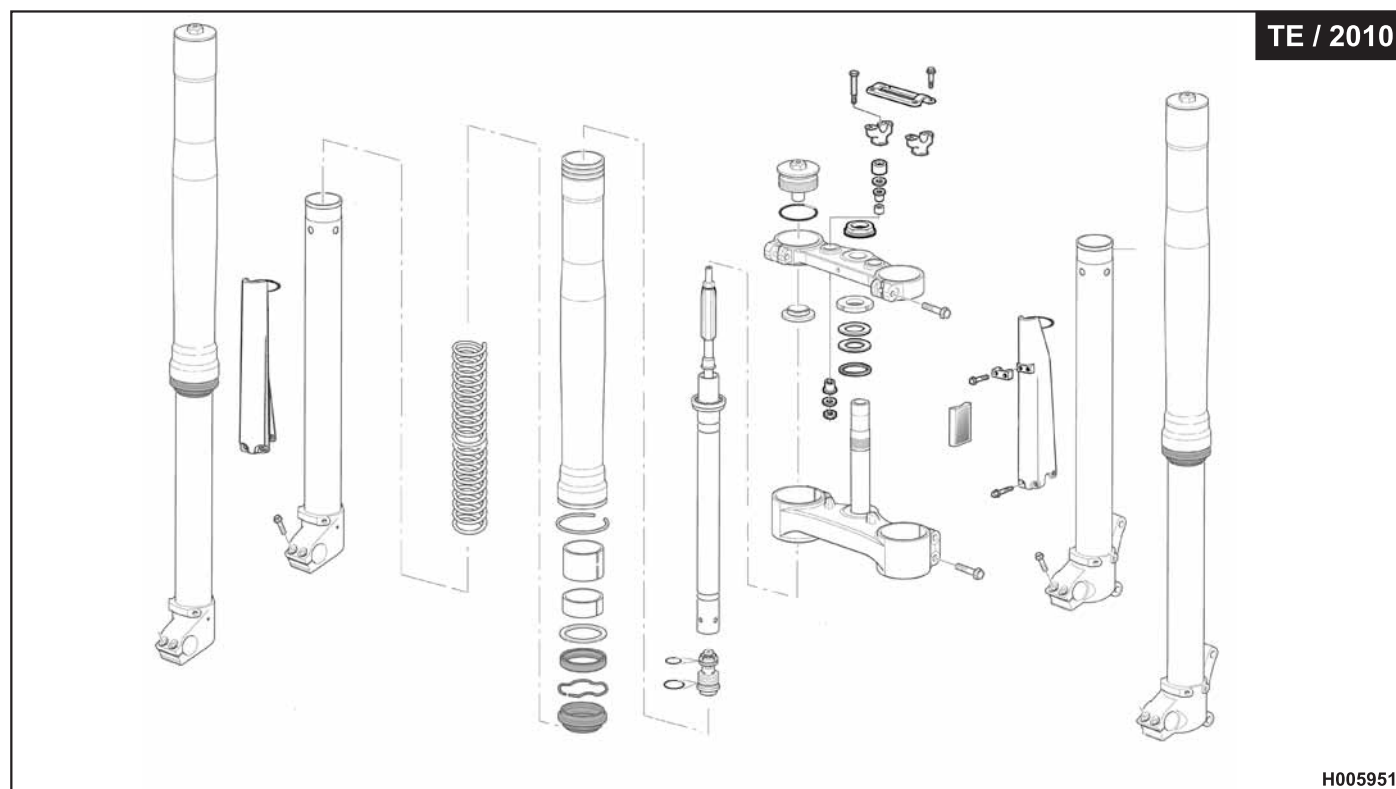
KAYABA front fork springs

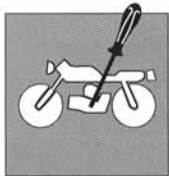
STANDARD

(TC - TXC / 2010): K=4.4 N/mm (spring part no. 8000 H2669)



(TE / 2010): K=4.2 N/mm (spring part no. 8000 H2690)



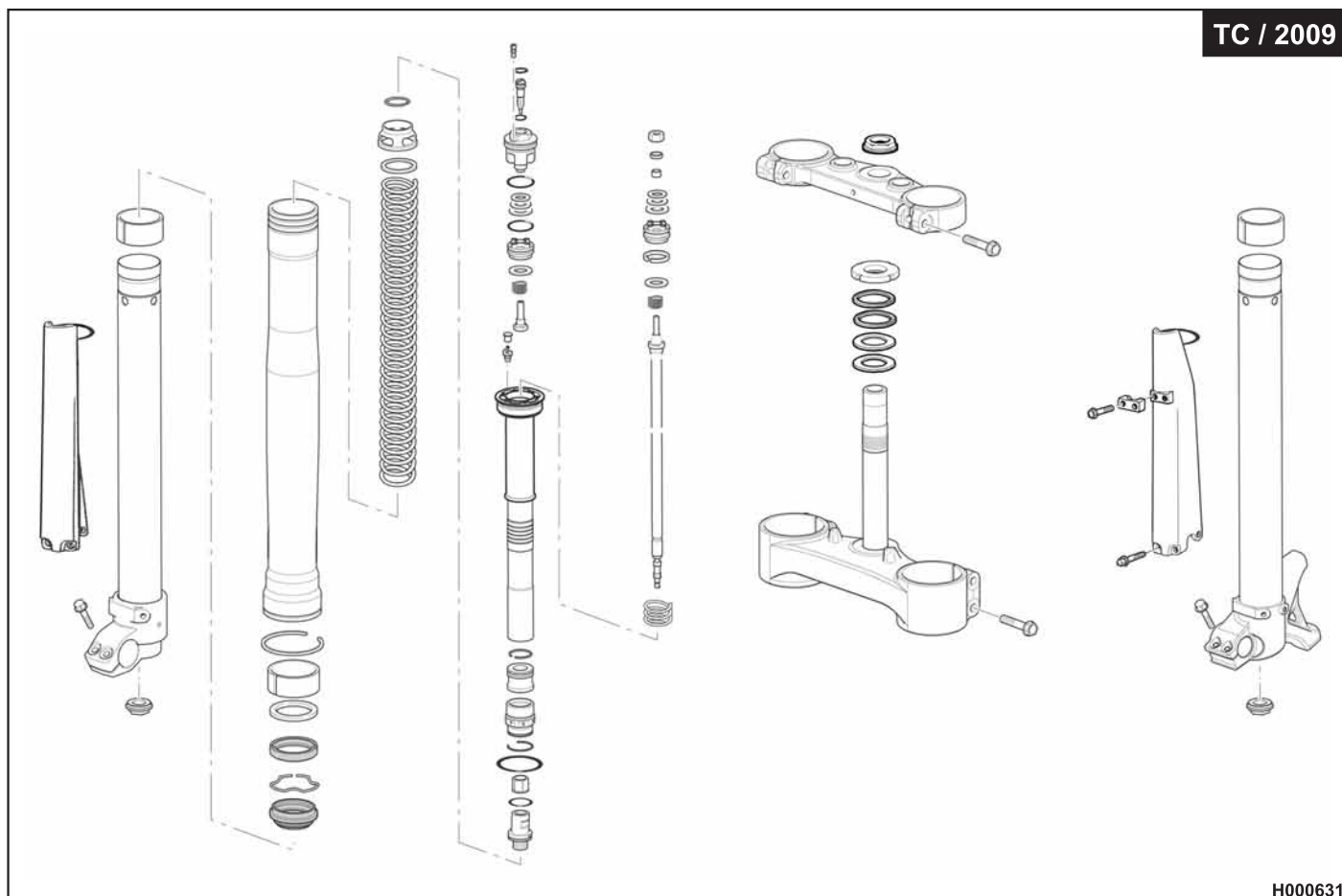


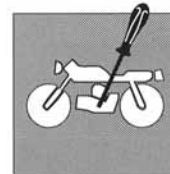
SETTINGS AND ADJUSTMENTS

MARZOCCHI front fork springs

STANDARD

K=4.8 N/mm (spring + spacer part no. 8000 H1994)



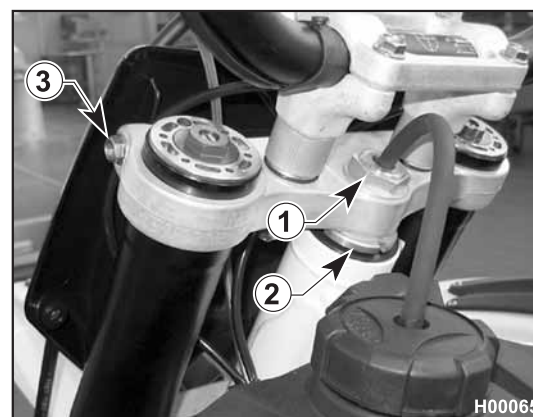


Steering bearing clearance adjustment

For safety reasons, the steering should always be adjusted so that the handlebar turns freely and without play. To check steering adjustment, set a stand or a block under the engine and see that the front wheel is lifted from the ground. Press lightly on the handlebar grips to cause the front end to rotate; the handlebar should turn smoothly. Sit on the ground in front of the front wheel and hold the lower ends of the fork legs. Push and pull in a front to rear motion to feel for play.

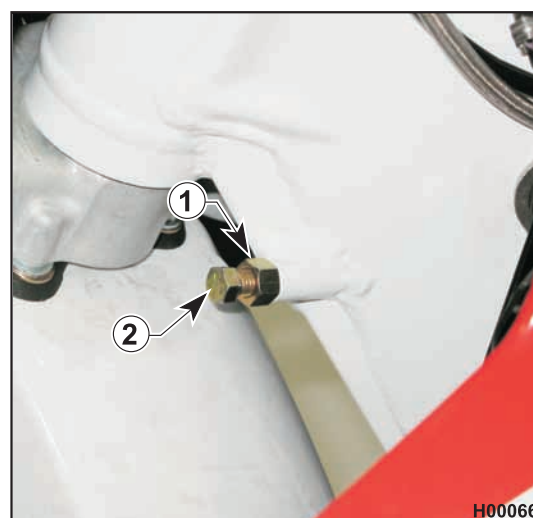
If any play is detected, adjust as follows:

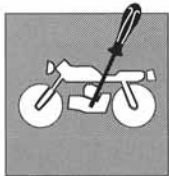
- Loosen the steering head tube nut (1);
- Loosen the four bolts (3) that secure the fork legs to the steering head; - Turn the steering head tube ring nut (2) clockwise using the special key until achieving correct play adjustment;
- Tighten the steering head tube nut (1) to $8\div9$ Kgm. ($78.4\div88.3$ Nm);
- Tighten the four bolts (3) on the steering head to 22.5-26.5 Nm (2.3-2.7 Kgm).



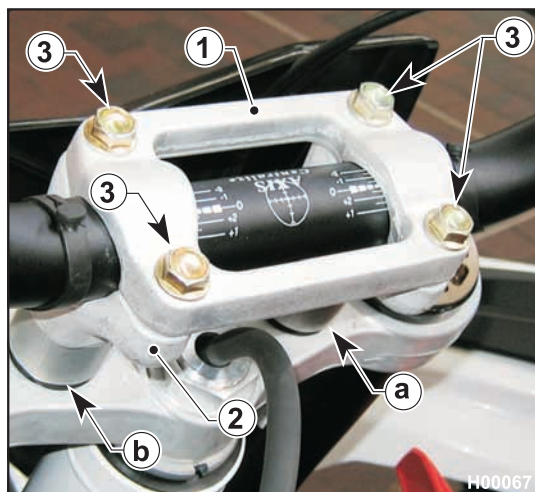
Steering angle adjustment

Steering angle can be modified by means of the adjuster assemblies located on either side of the steering head tube as follows: loosen the check nut (1), turn the adjuster screw (2) until setting the desired steering angle and then re-tighten the check nut (1). Make the same changes on both sides.





SETTINGS AND ADJUSTMENTS



Changing handlebar position and height

Handlebar position (a) and height (b) can be modified to better suit your personal preferences. To perform these adjustments, remove the handlebar clamp bolts (3) and (4), and then remove the handlebar upper (1) and lower (2) clamps.

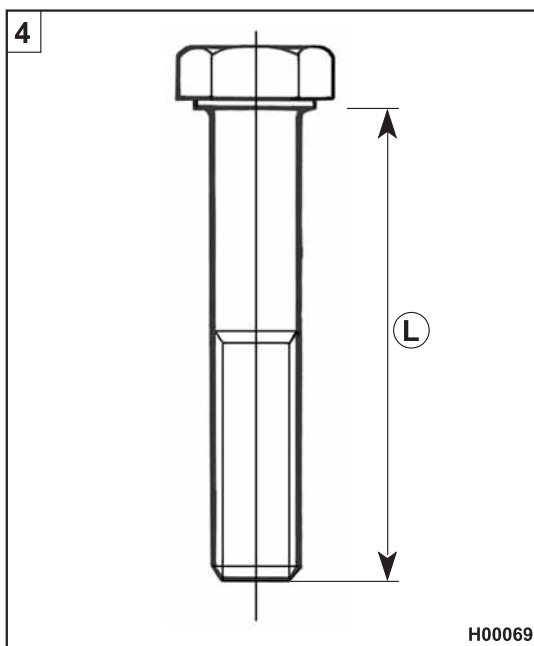
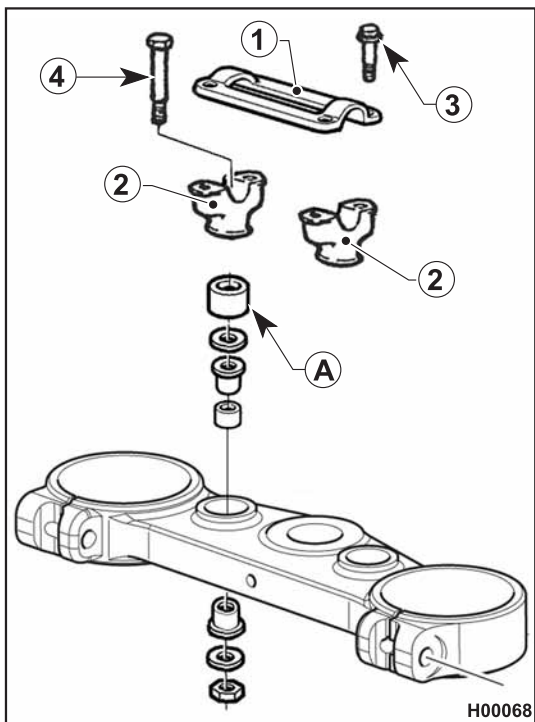
a) Changing handlebar position

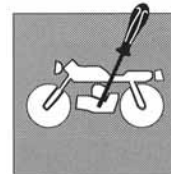
Rotate the lower clamp by 180° to move handlebar position forward or backward (10 mm - 0.04 in.).

b) Changing handlebar height

Remove the lower spacer (A) and replace the screw (4) with a 65 mm long screw.

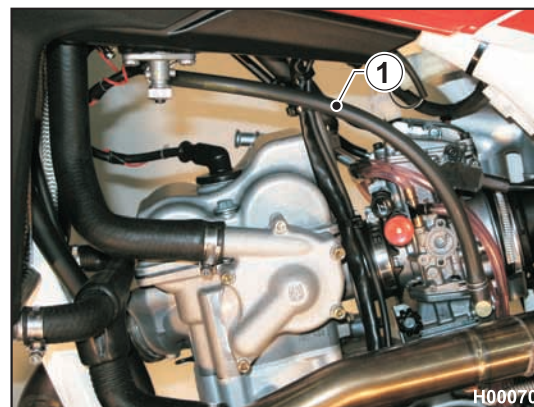
When finished, tighten the bolts (3) to 2.75-3.05 kgm (27 -30 Nm; 19.9-22 lb/ft) and the bolts (4) to 2.0-2.2 kgm (19.6 -21.6 Nm; 14.5-15.9 lb/ft).





Supply hose check (TC)

Check the hose (1) for leaks and replace it as required.
Remove the supply hose as described in Section "E".



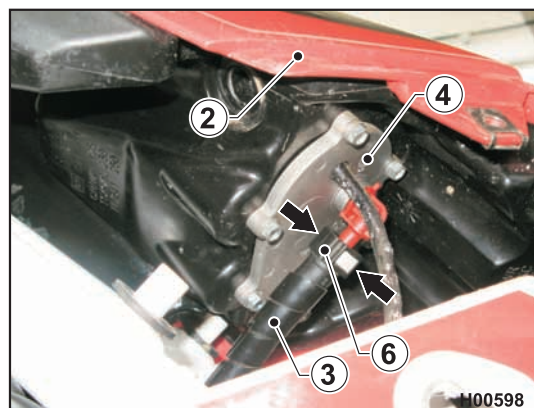
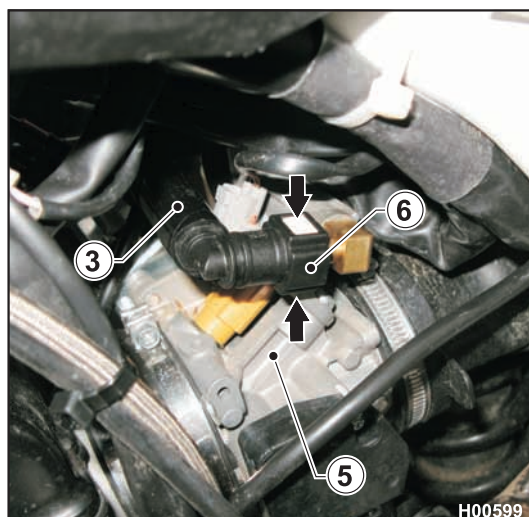
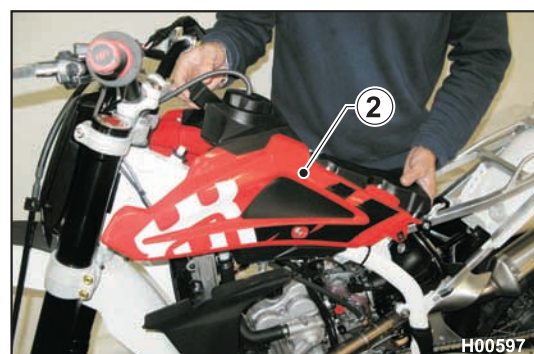
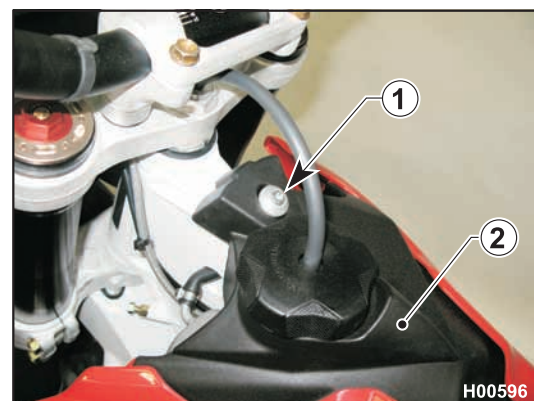
Supply hose check (TE – TXC)

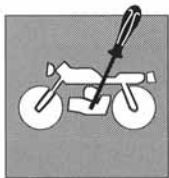
Remove saddle and side panels as described in Section "E".

Remove the tank (1) retaining screw (2).

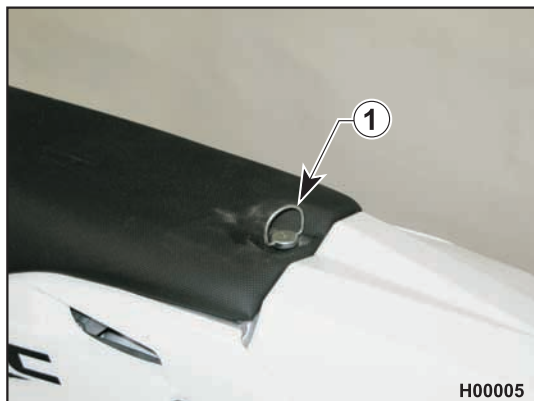
Lift the tank (2) and check the hose (3) running from the pump (4) to the throttle body (5).

To replace the hose, squeeze the two retainer tabs (6) at one end of the hose and detach hose. Repeat at the other end of the hose.





SETTINGS AND ADJUSTMENTS

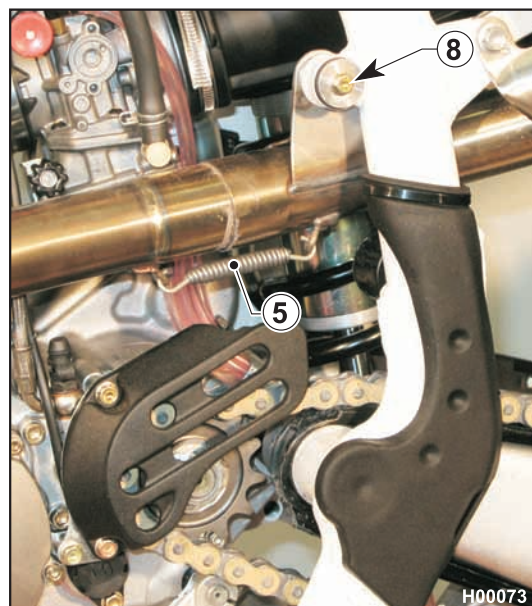
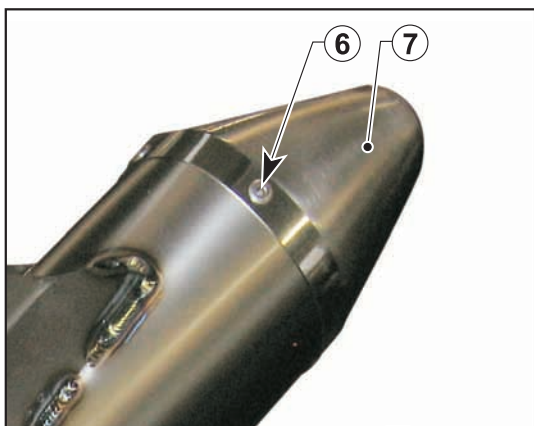
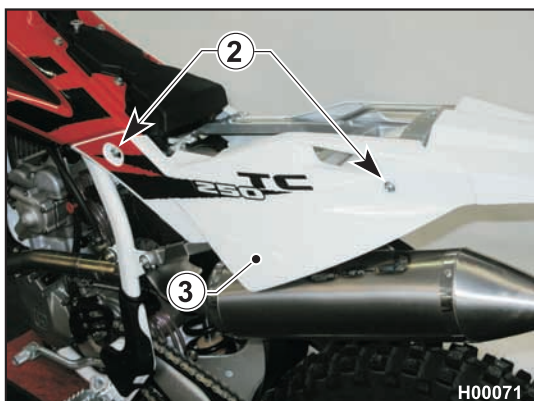


Silencer sound deadening material replacement

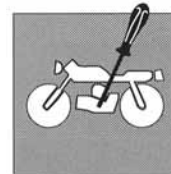
Turn the rear fixing (1) counter clockwise and remove the saddle. Loosen the screws (2) and remove the left-hand side panel (3). Using an 8 mm T-wrench on the outside and a 10 mm T-wrench on the inside, remove the silencer retaining screw (4). Remove the spring (5) and then the screw (8) using an 8 mm T-wrench; remove the silencer. Remove the six rear rivets (6), the clamp and the exhaust end cap (7). Remove the inner pipe and replace the sound deadening material. Reassemble the L.H. side panel and the saddle.



If the silencer proves hard to remove, tap lightly with a rubber or plastic hammer to aid removal.



SETTINGS AND ADJUSTMENTS



Exhaust system check

Remove exhaust system components as described in Section "E". Check pipes (1) and (2) silencer (3) for cracks or damage: replace if cracked or damaged.





Section

E





GENERAL PROCEDURES

Foreword	E.3
Saddle removal.....	E.4
Side panel removal.....	E.4
Removing the rear chassis complete with mudguard and air box (TC).....	E.5
Removing the rear chassis complete with mudguard and air box (TE-TXC).....	E.5
Battery removal	E.7
Exhaust system removal	E.8
Fuel tank, scoop and spoiler removal (TC).....	E.10
Fuel tank, scoop and spoiler removal (TE-TXC).....	E.13
Fuel pump removal (TE-TXC).....	E.16
Solenoid starter removal (TE-TXC)	E.17
CDI electronic control unit removal.....	E.18
Voltage regulator removal (TE-TXC)	E.18
Ignition coil removal.....	E.19
Clutch hose removal.....	E.20
Horn removal (TE).....	E.20
Electric cooling fan removal (TE-TXC)	E.21
Secondary drive chain removal	E.22
Engine removal.....	E.22
Radiator removal	E.30
Thermostat removal (TE-TXC)	E.31





Foreword

This section describes the operations preliminary to engine removal. Please note that, in order to gain access to certain motorcycle components (rear shock absorber, electrical parts, wiring, etc.), it may be necessary to partially remove some parts.



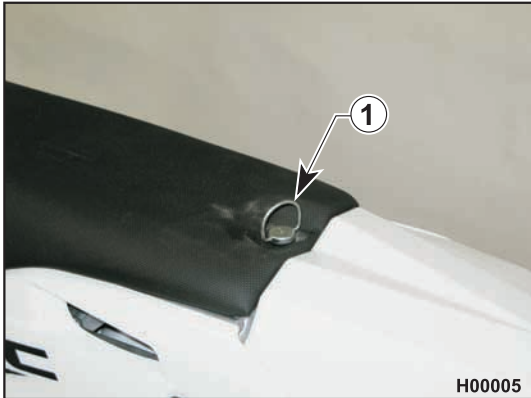
RIGHT-HAND SIDE



LEFT-HAND SIDE

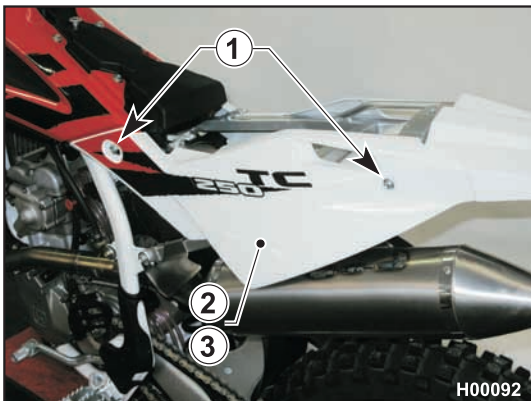


GENERAL PROCEDURES



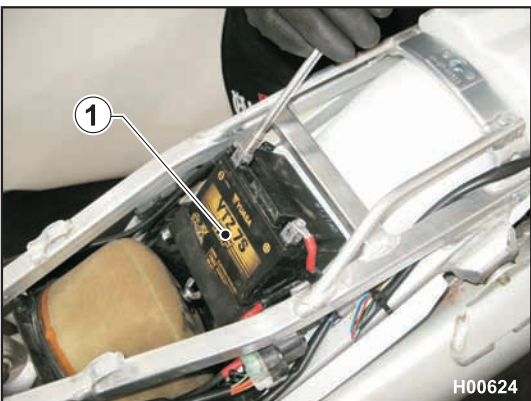
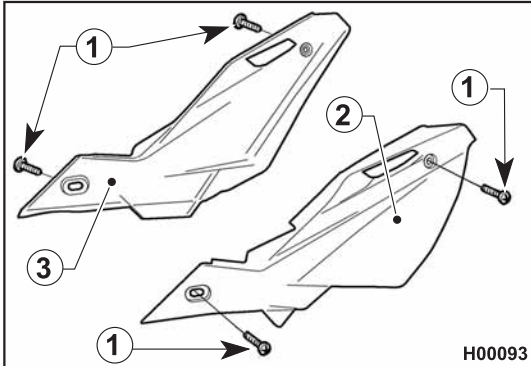
Saddle removal

- Turn the rear fixing (1) counter clockwise and remove the saddle.



Side panel removal

- Remove the saddle as described in the relevant paragraph.
- Loosen the retaining screws (1) and remove the side panels (2) and (3).



Battery removal (TE - TCX)

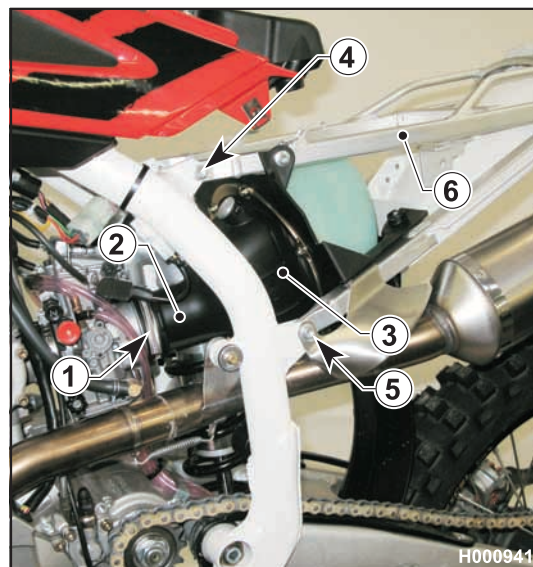
- Remove the saddle as described in the relevant paragraph.
- First remove the BLACK negative cable (8 mm Allen wrench), then the RED positive cable (when reassembling, first connect the RED positive cable, then the BLACK negative cable); remove the battery (1) from its housing.





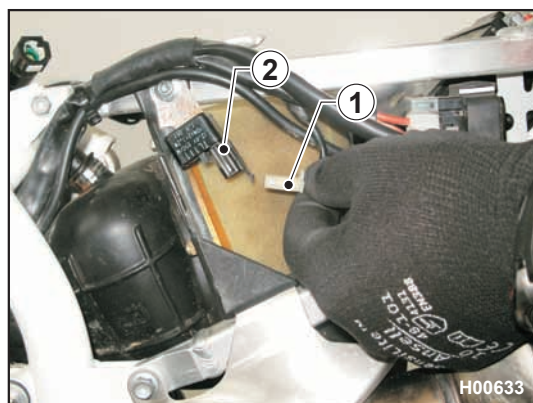
Removing the rear chassis complete with mudguard and air box (TC)

- Remove the saddle as described in the relevant paragraph.
- Remove the side panels as described in the relevant paragraph.
- Lift the tank at the rear end.
- Remove the exhaust silencer as described in the relevant paragraph.
- Slacken the clamp (1) that secures the rubber coupling (2) of the air box (3) at the carburettor end.
- Remove the upper fixing (4) and lower fixings (5) on both sides of the rear chassis using a 10 mm ring wrench.
- Pull the rear chassis (6) rearwards together with mudguard and air box, and detach it from the main chassis.



Removing the rear chassis complete with mudguard and air box (TE – TXC)

- Remove the following parts in the order given: saddle, side panels, fuel tank, silencer and battery (see relevant paragraphs for instructions).
- Shear the plastic clips securing wiring to rear chassis.
- Disconnect the connector (1) of the turning indicator relay (2) (TE).

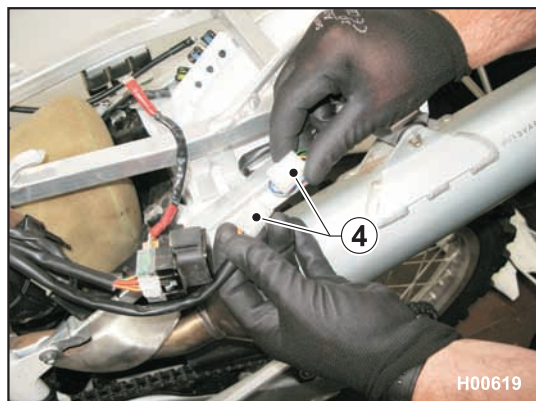


- Remove the solenoid starter (3) from its mount.

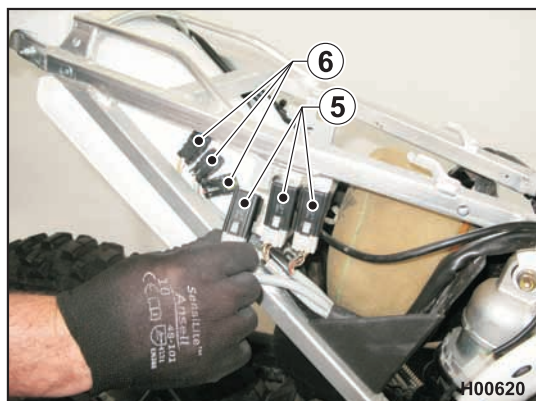




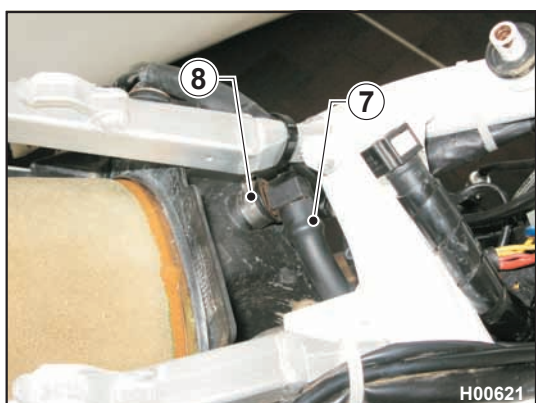
GENERAL PROCEDURES



- Disconnect the connector (4) of the tail light unit (TE).



- Detach relays (5) and fuses (6) on the right-hand side of the motorcycle.

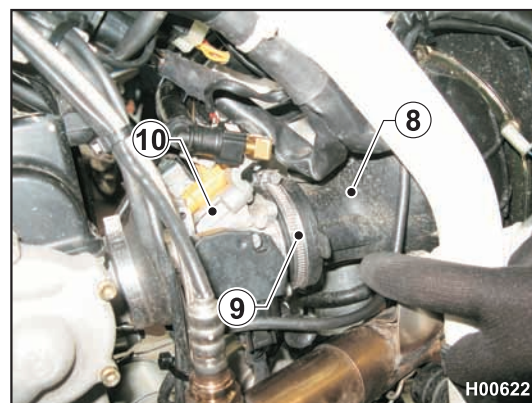


- Detach the breather hose (7) from the air filter (8).

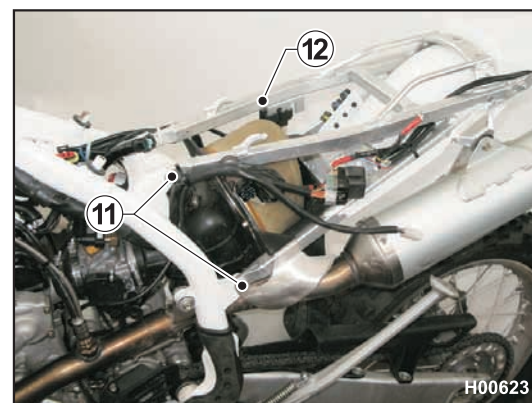




- Unscrew the clamp (9) connecting air filter (8) to throttle body (10).



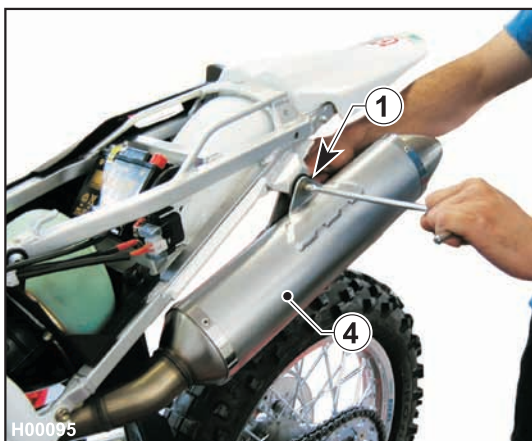
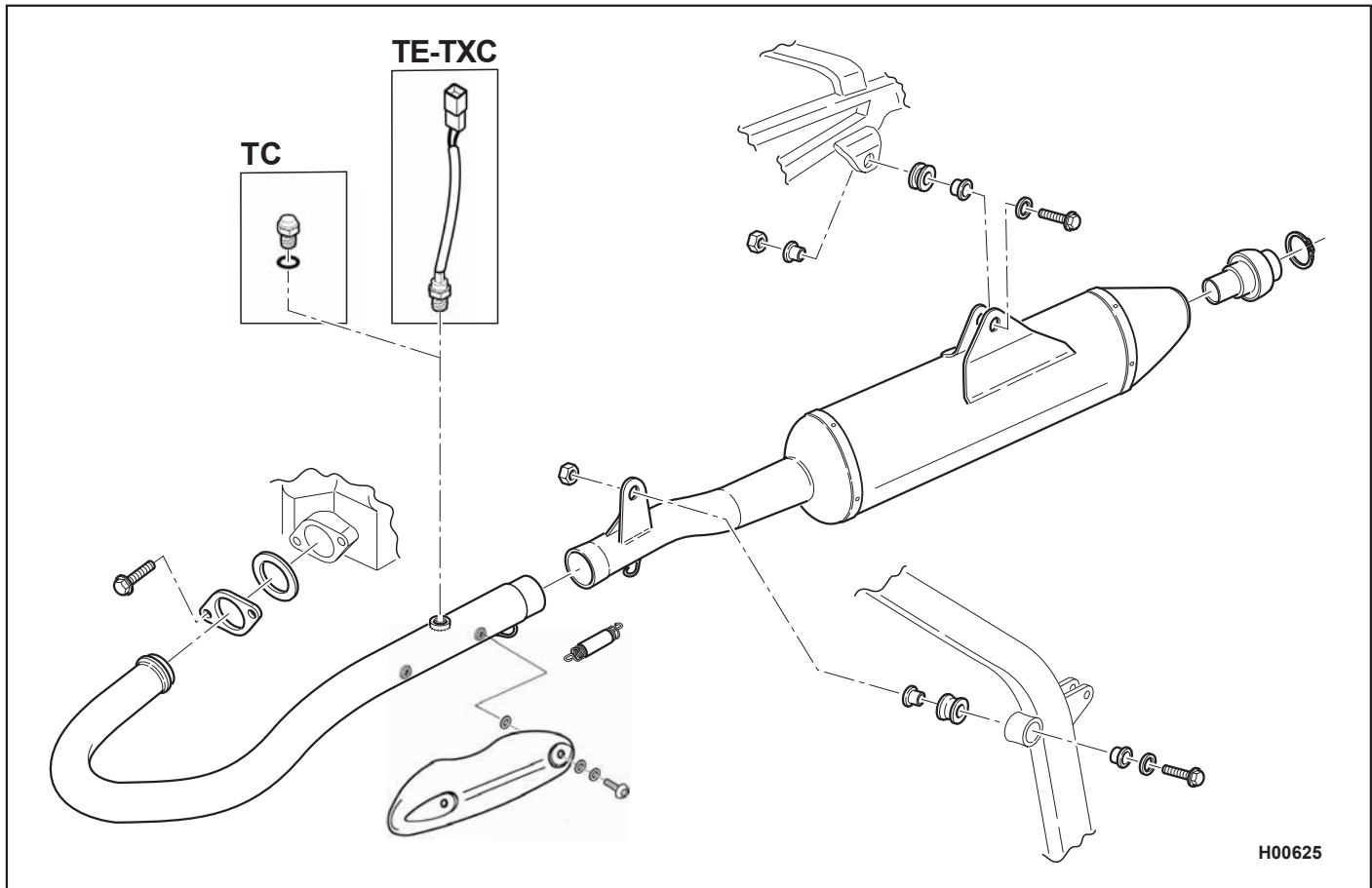
- Remove the four screws (11) of the rear chassis (12) using a 10 mm ring wrench.
- Pull the rear chassis (12) rearwards together with mudguard and air box , and detach it from the main chassis.





GENERAL PROCEDURES

Exhaust system removal

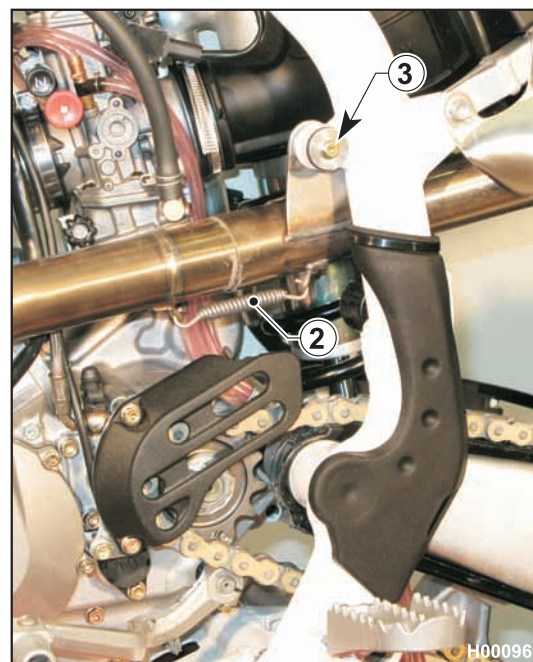


- Remove the saddle as described in the relevant paragraph.
- Remove the left-hand side panel as described in the relevant paragraph.
- Using an 8 mm T-wrench on the outside and a 10 mm T-wrench on the inside, remove the silencer (4) retaining screw (1).

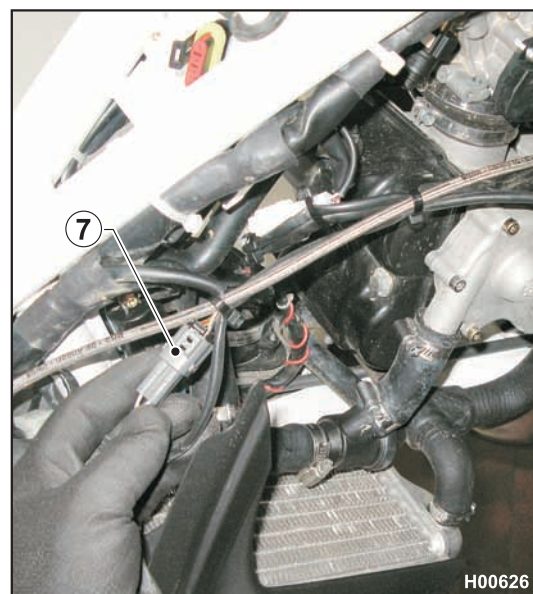




- Remove the spring (2) and the screw (3) using an 8 mm T-wrench; slide out the silencer (4).

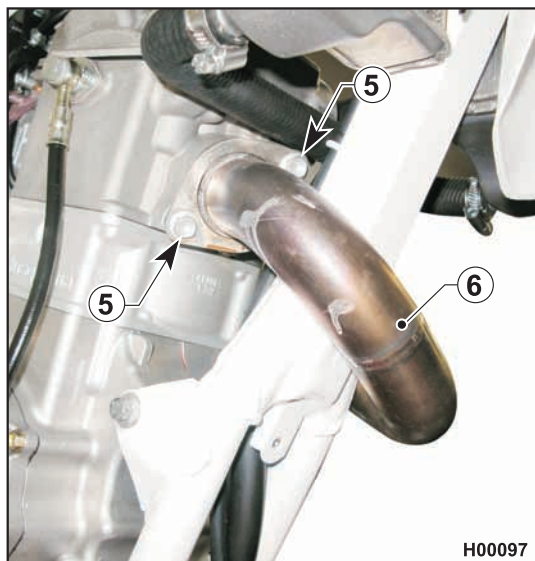


- Disconnect the Lambda sensor connector (7) and shear the wiring clips (TE-TXC).



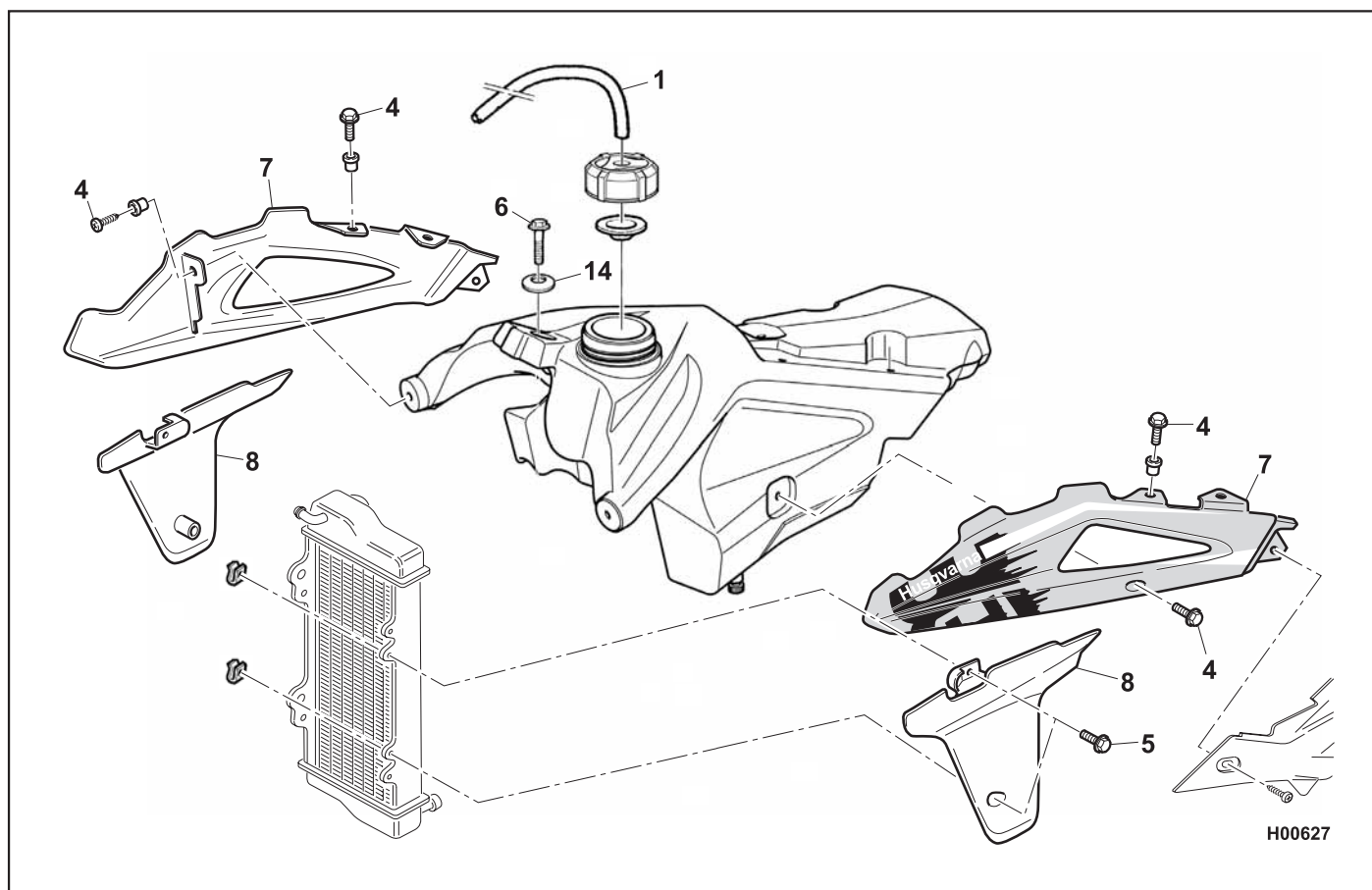


GENERAL PROCEDURES



- Loosen the two bolts (5) and remove the exhaust pipe (6).

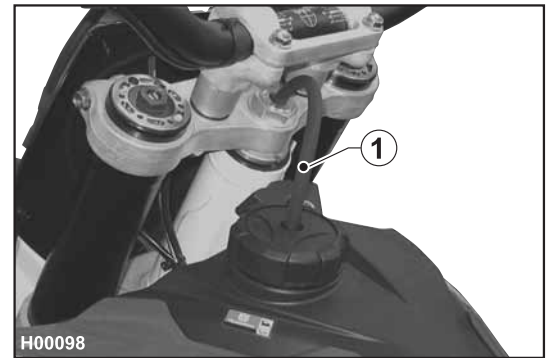
Fuel tank, scoop and spoiler removal (TC)



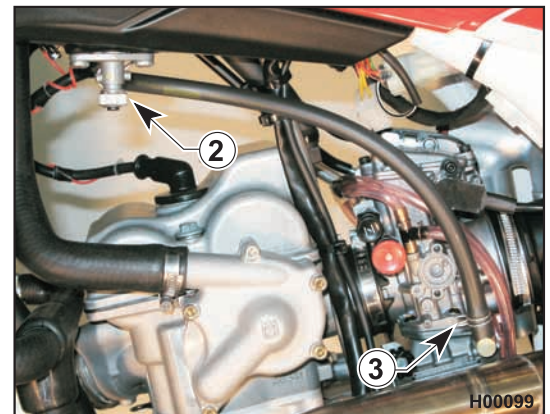
GENERAL PROCEDURES



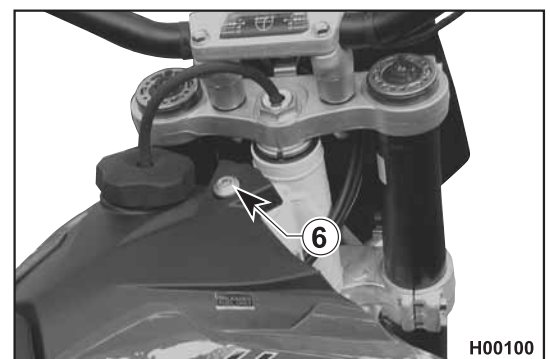
- Remove the saddle as described in the relevant paragraph.
- Remove the side panels as described in the relevant paragraph.
- Remove the breather hose (1) from the steering stem.



- Turn the ring nut of the fuel cock (2) counter clockwise to shut off fuel supply and loosen the clamp (3) on the hose running to the carburettor. Detach the hose at carburettor end and let fuel drain into a pan.



- Loosen the fuel tank retaining screw (6).

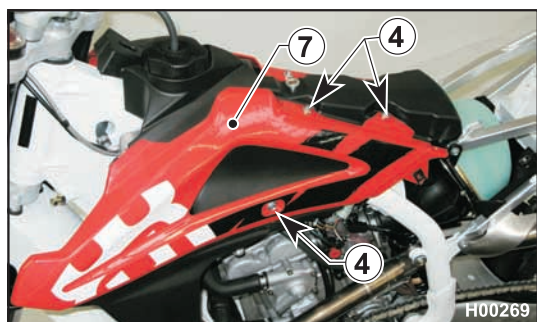
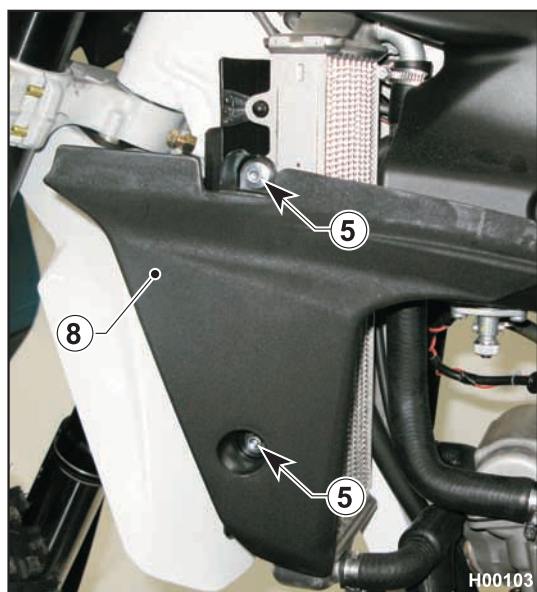




GENERAL PROCEDURES

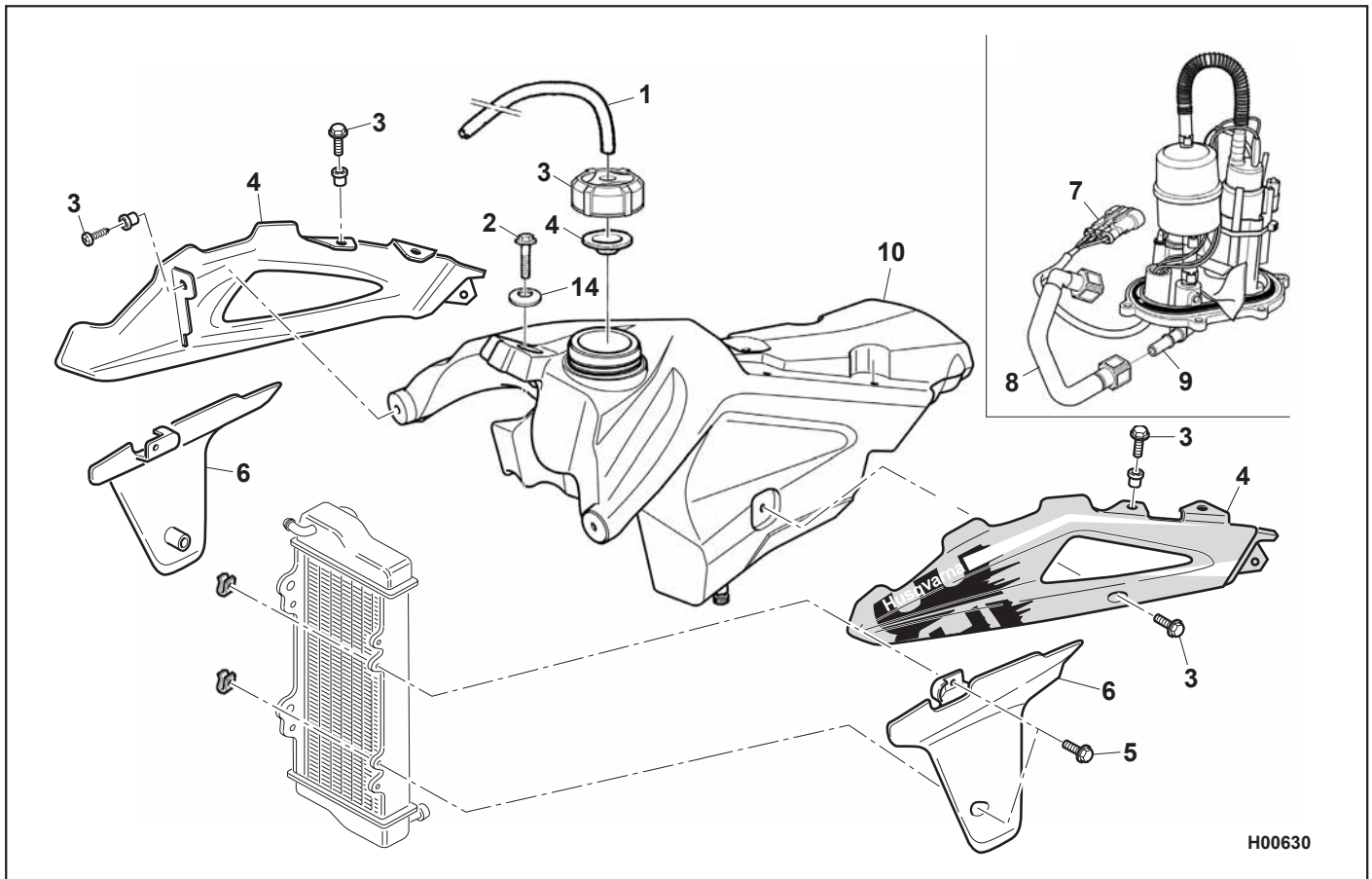


- Remove the screws (4) retaining the scoops to the fuel tank. Remove the scoops (7) and the screws (5) retaining the spoilers (8) to the radiators. Remove the spoilers and slide out the tank.

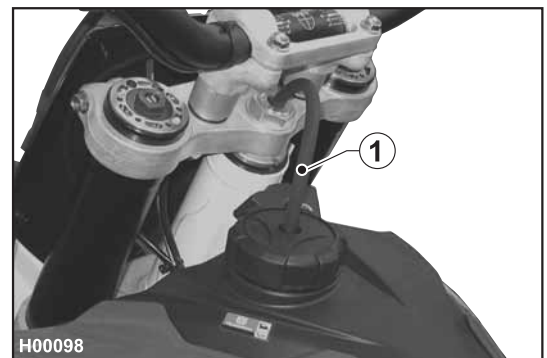




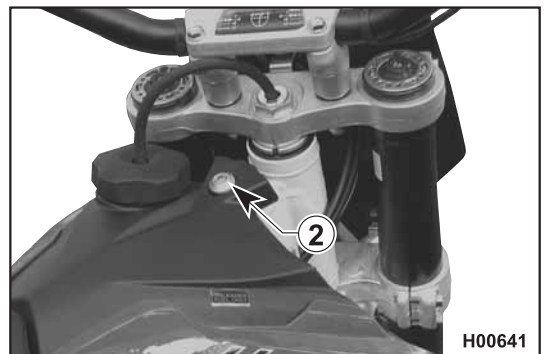
Fuel tank, scoops and spoiler removal (TE – TXC)



- Remove the saddle as described in the relevant paragraph.
- Remove the side panels as described in the relevant paragraph.
- Remove the breather hose (1).



- Loosen the fuel tank retaining screw (2).

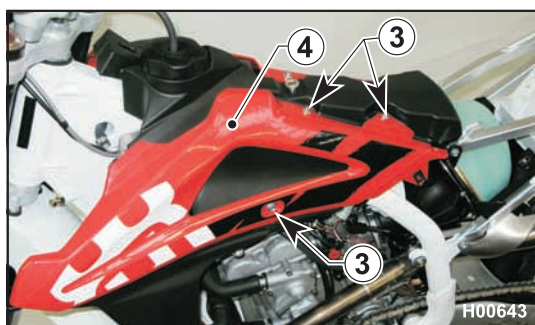
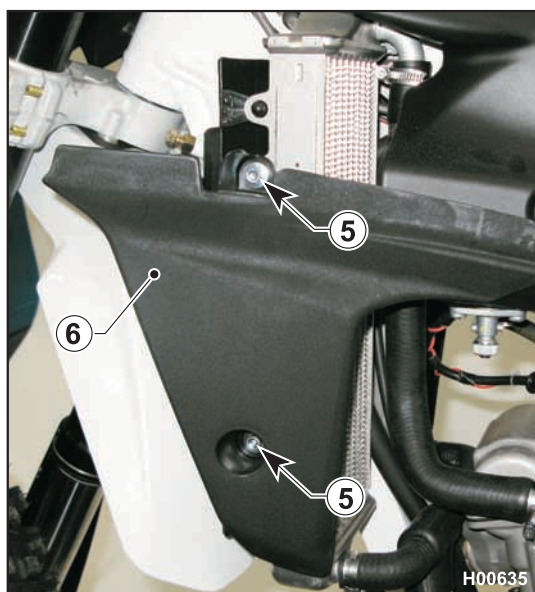




GENERAL PROCEDURES

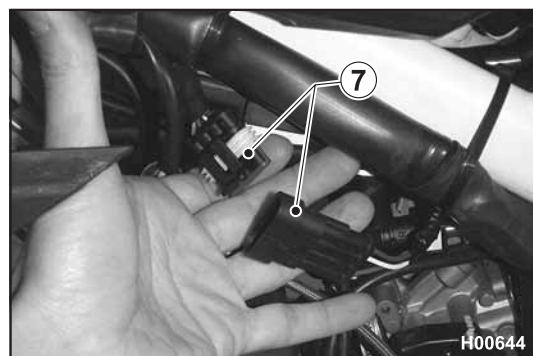


- Remove the screws (3) retaining the scoops to the fuel tank. Remove the scoops (4) and the screws (5) retaining the spoilers (6) to the radiators and then remove the spoilers.

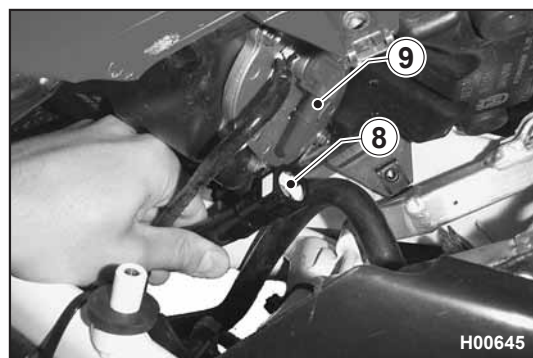




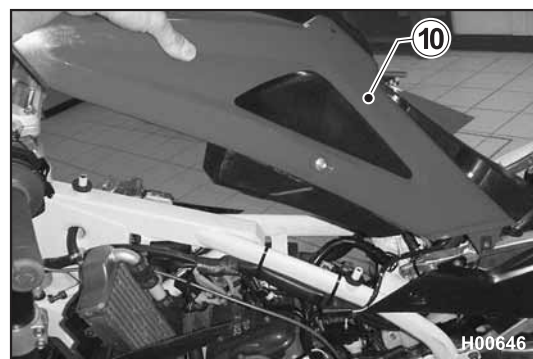
- Disconnect the fuel pump connector (7) from the main wiring harness.



- Lift the tank and disconnect the hose (8) from the fuel pump outlet fitting (9) in the bottom section of the tank.

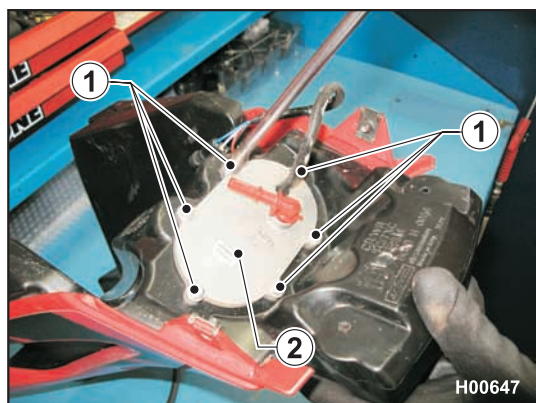


- Slide out the tank (10).



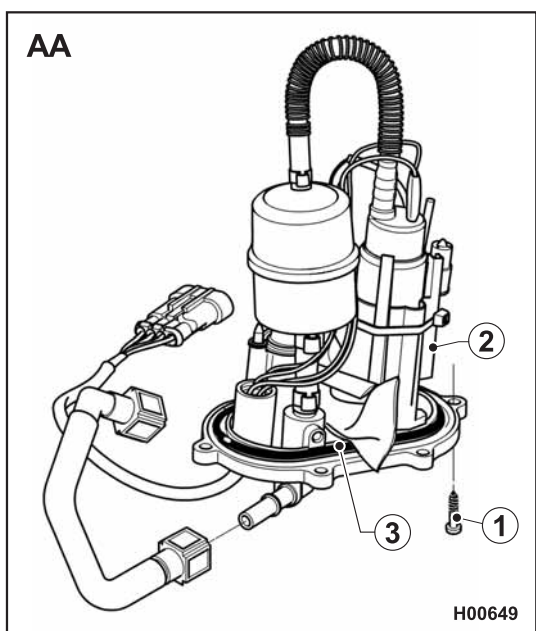
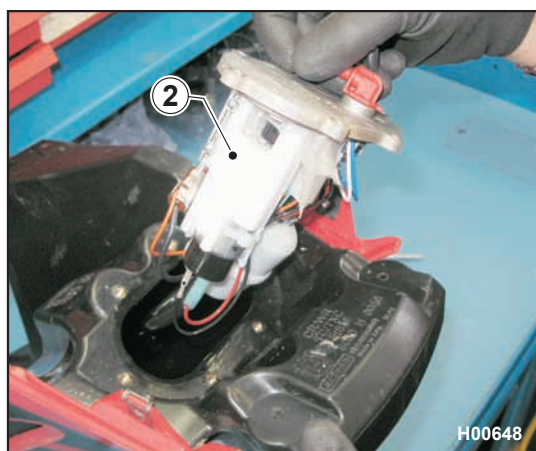


GENERAL PROCEDURES



Fuel pump removal (TE – TXC)

- Remove the fuel tank as described in the relevant paragraph.
- Remove the tank filler cap and pour the fuel contained in the tank into a vessel of adequate capacity.
- Use an Allen wrench to loosen the 6 screws (1) and remove the pump (2).



WARNING

On assembly, make sure that the pump O-ring (3) is correctly positioned in its seat.



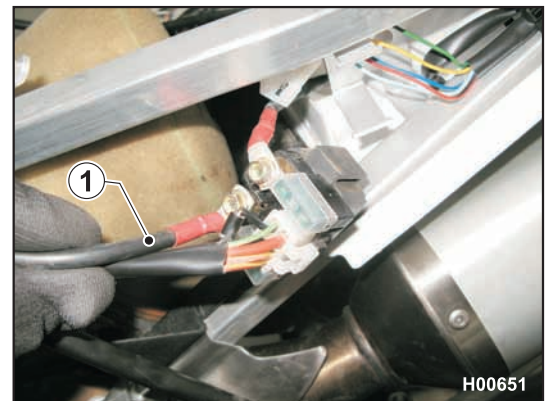


Solenoid starter removal (TE – TXC)

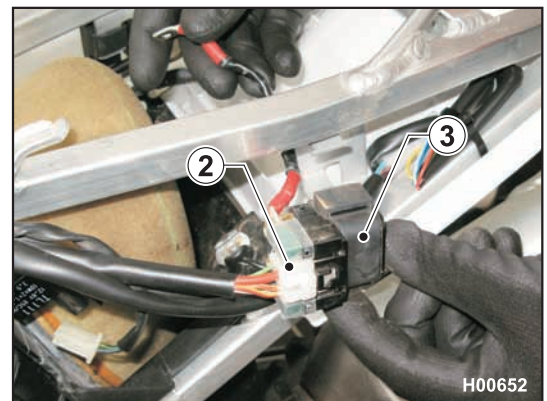
- Remove saddle and left-hand side panel (in this order) as outlined in the relevant paragraphs.
- Disconnect the negative and positive cables of the battery.

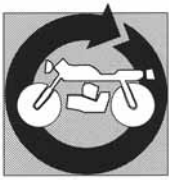


- Disconnect the starter motor positive cable (1) from the solenoid starter.



- Disconnect the connector (2) and remove the solenoid starter (3) from its mount.

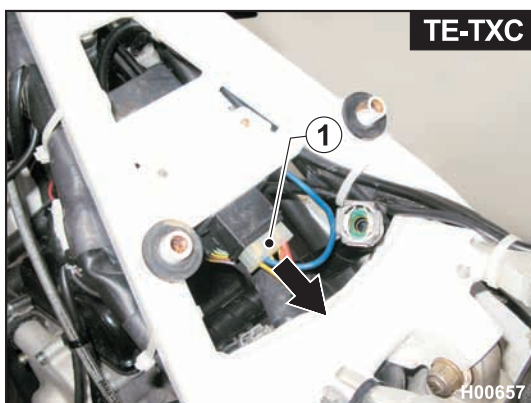
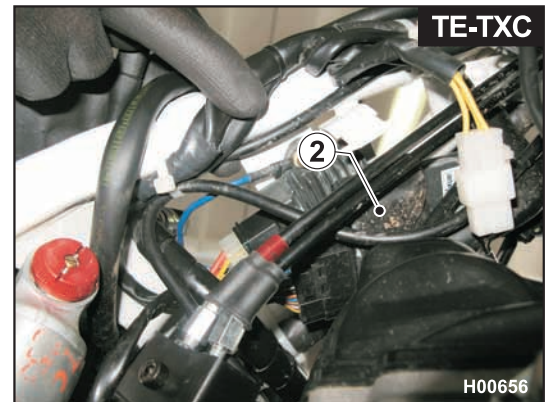
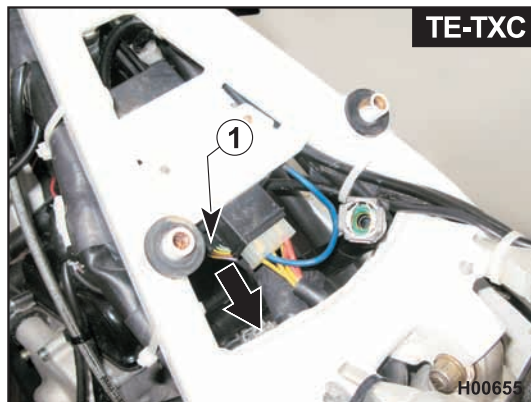
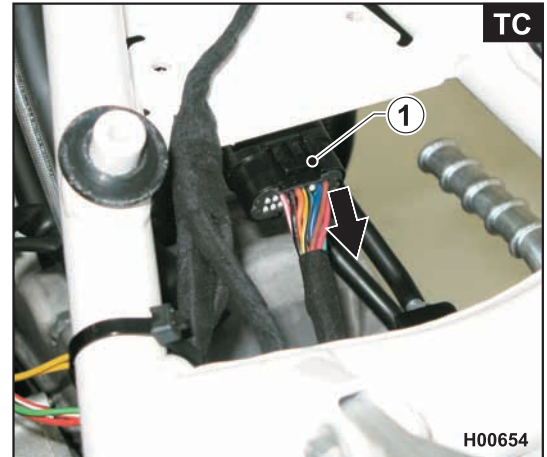
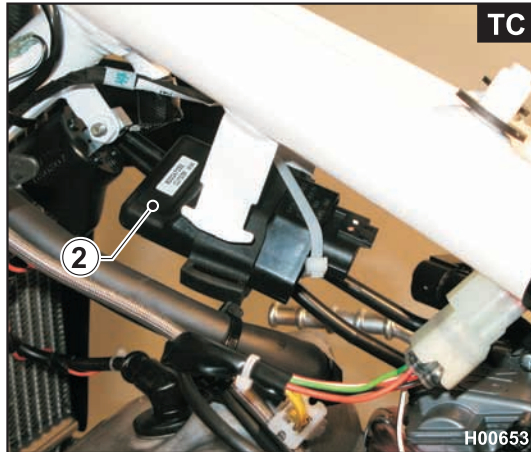




GENERAL PROCEDURES

CDI electronic control unit removal

Remove: saddle and fuel tank as described in the relevant paragraphs.
Detach the connector (1) from the CDI electronic control unit (2) and take the control unit together with its vibration mount out of the chassis.

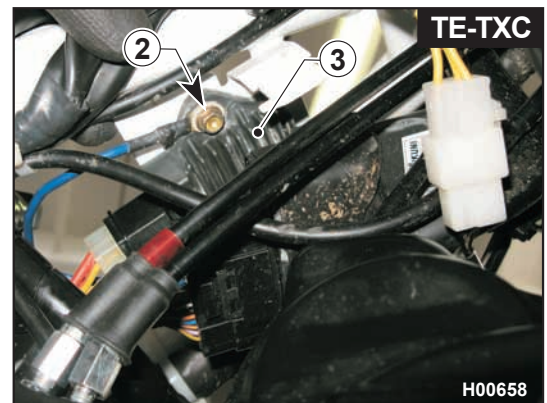


Voltage regulator removal (TE – TXC)

- Remove the electronic control unit as described in the relevant paragraph.
- Disconnect the connector (1).

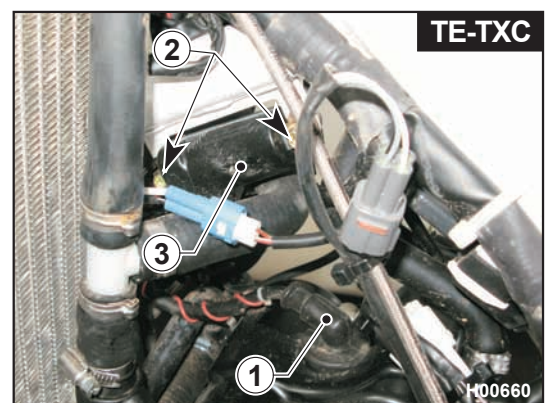
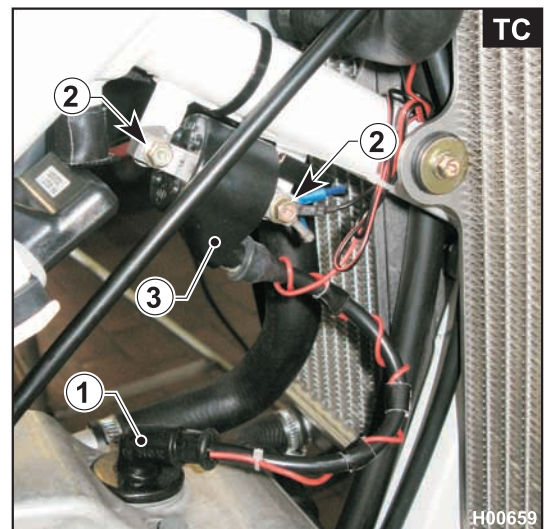


- Loosen the two retaining screws (2) and remove the regulator (3).



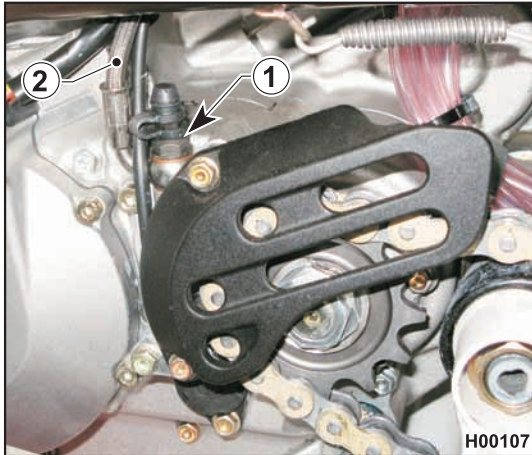
Ignition coil removal

- Remove: saddle and fuel tank as described in the relevant paragraphs.
- Remove the spark plug cap (1).
- Remove the retaining screws (2) and then the coil (3).



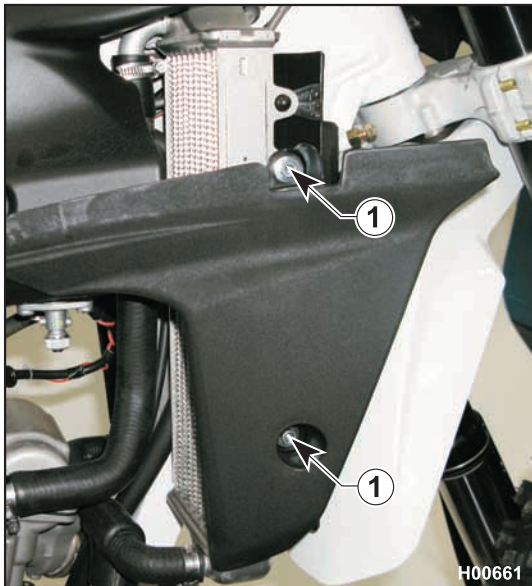


GENERAL PROCEDURES



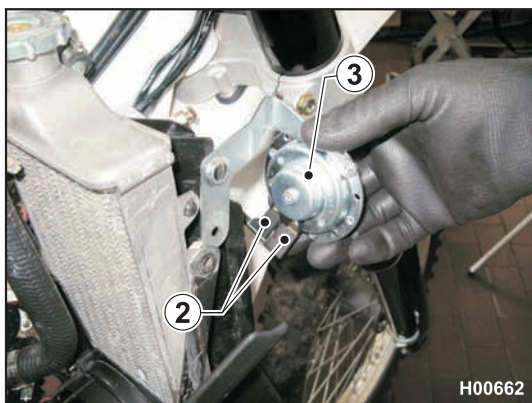
Clutch hose removal

- Loosen the fitting (1) of the clutch hose (2) on the left-hand of the engine.
- Drain any oil left in the hose. On assembly, bleed the clutch system as described in Section "P".



Horn removal (TE)

- Remove saddle and fuel tank (in this order) as outlined in the relevant paragraphs.
- Loosen the screw (1) securing the spoiler to the right-hand radiator.



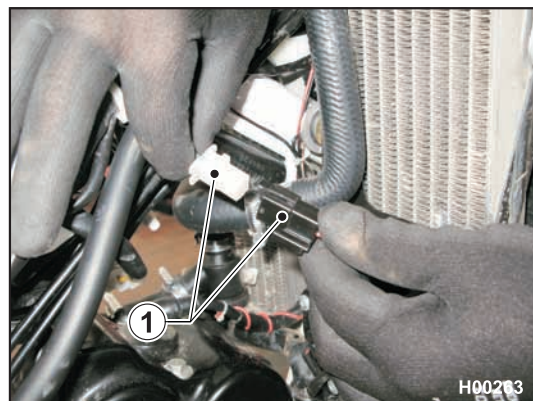
- Disconnect the two connectors (2) and remove the horn (3) with its bracket.



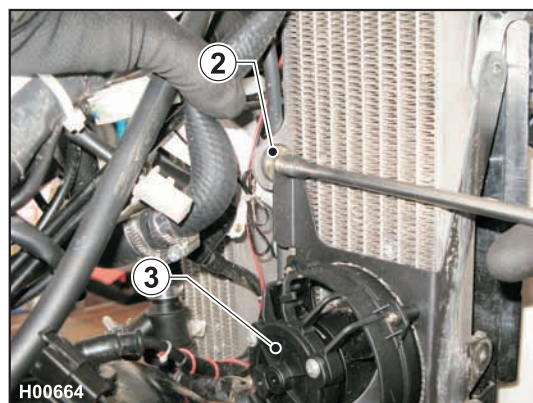


Electric cooling fan removal (TE – TXC)

- Remove saddle, fuel tank and scoops (in this order) as outlined in the relevant paragraphs.
- Disconnect the connector (1).

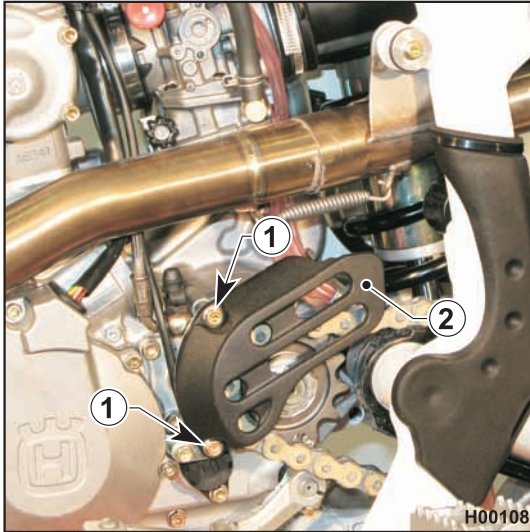


- Loosen the screw (2) and remove the electric fan (3).





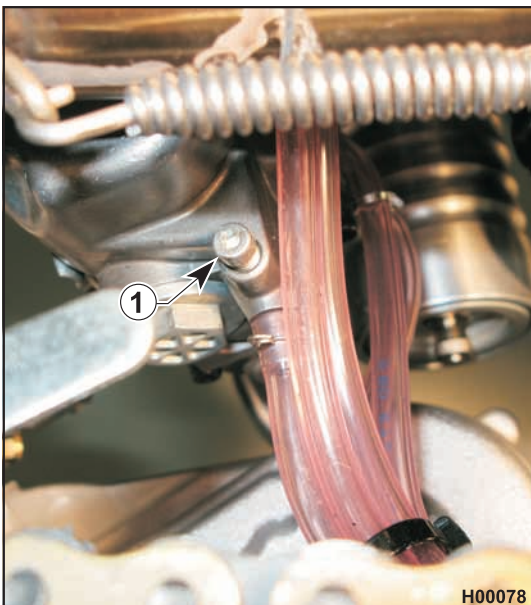
GENERAL PROCEDURES



Secondary drive chain removal

The following procedure applies to both O-ring chains and chains without O-rings:

- Remove: screws (1), sprocket guard (2), clip (3), master link (4) and chain (5).



Engine removal

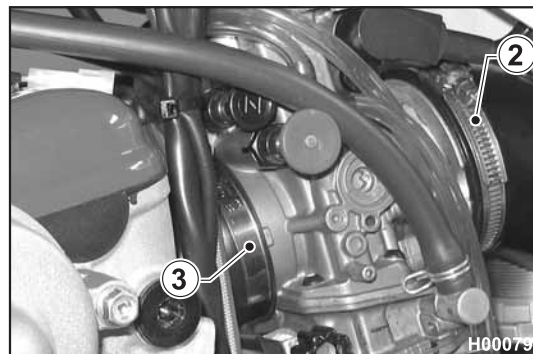
- Remove the saddle as described in the relevant paragraph.
- Remove the side panels as described in the relevant paragraph.
- Remove the fuel tank as described in the relevant paragraph.
- Remove the exhaust system as described in the relevant paragraph.
- Slacken the drain screw (1) and drain fuel into a vessel (TC).





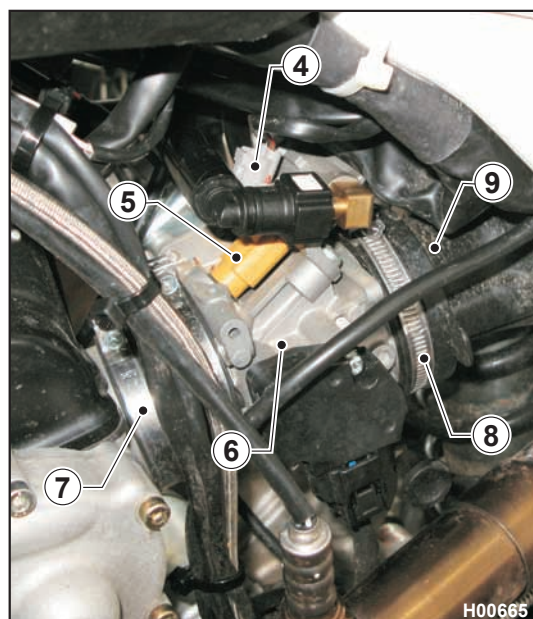
(TC)

- Slacken the clamps (2) and (3) securing the carburettor to the intake coupling and to the hose coupling on the air box. Pull the carburettor rearwards to release it from the intake coupling and extract it from the right-hand side of the motorcycle.

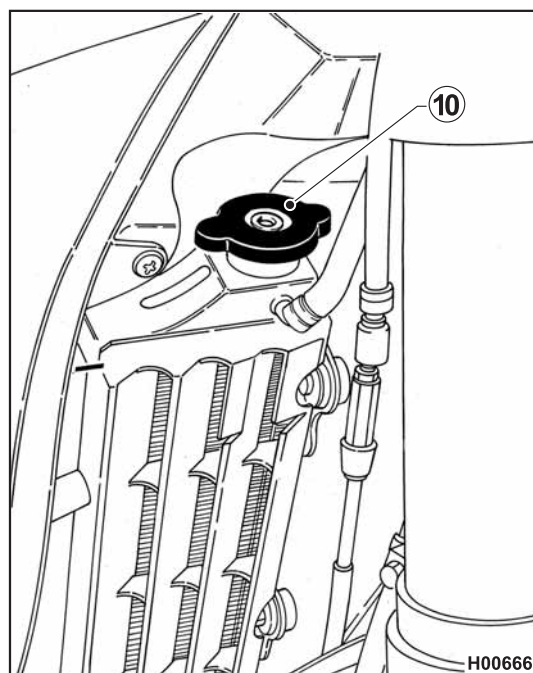


(TE – TXC)

- Disconnect the connectors (4) and (5) from the throttle body (6).
- Loosen the clamps (7) and (8).
- Push the intake coupling (9) towards the rear end of the motorcycle to release the throttle body (6) and then extract it from the right-hand side of the motorcycle.

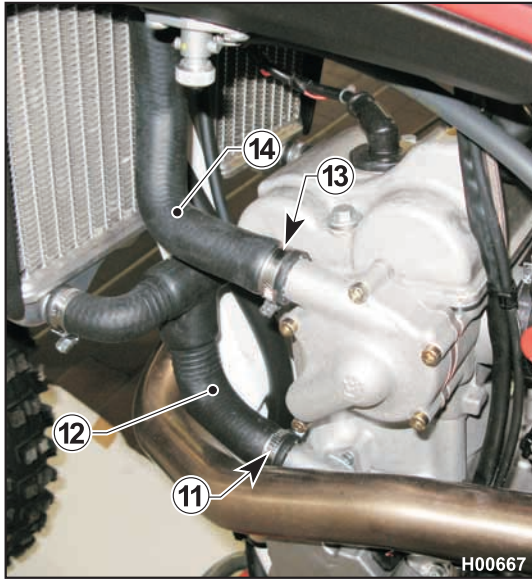


- Place a vessel on the left-hand side of the cylinder, under the engine.
- Slacken the radiator cap (10).

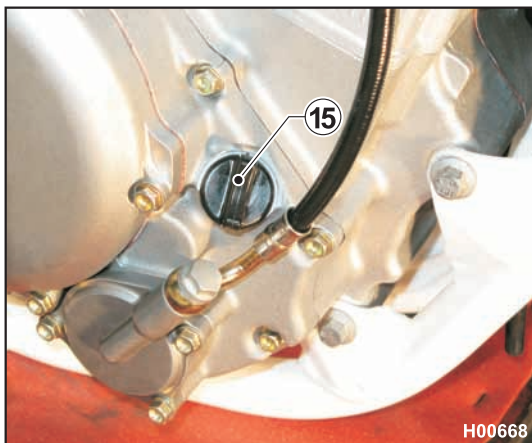




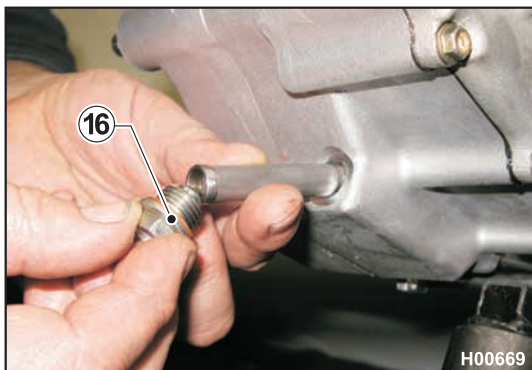
GENERAL PROCEDURES



- Slacken the clamp (11) and disconnect the hose (12) connecting the radiators to the engine. Drain all fluid.
- Slacken the clamp (13) and disconnect the hose (14) connecting the radiator to the water pump.

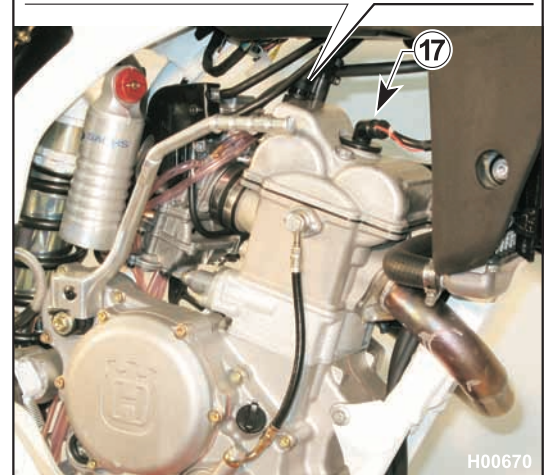
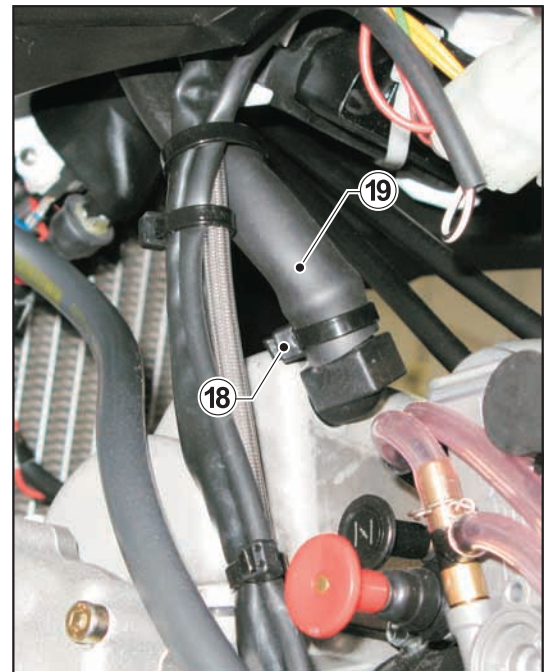


- Remove the oil sump guard, place a pan under the engine and remove the oil filler cap (15); remove the oil drain plug (16) with a 12 mm wrench and drain the oil.

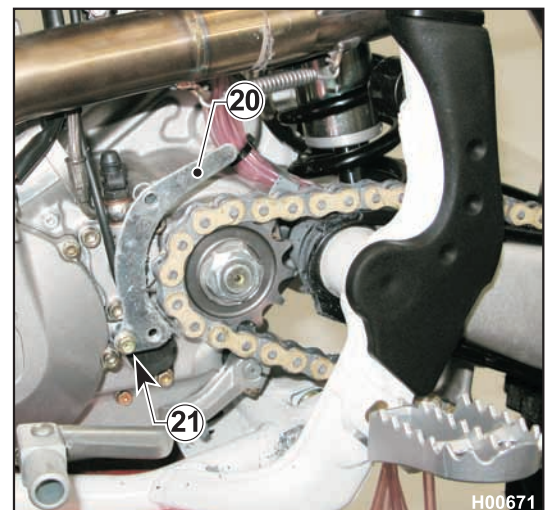




- Remove the spark plug cap (17).
- Remove the clamp (18) and disconnect the hose (19) from the cylinder head cover.
- Remove the chain as described in the relevant paragraph.

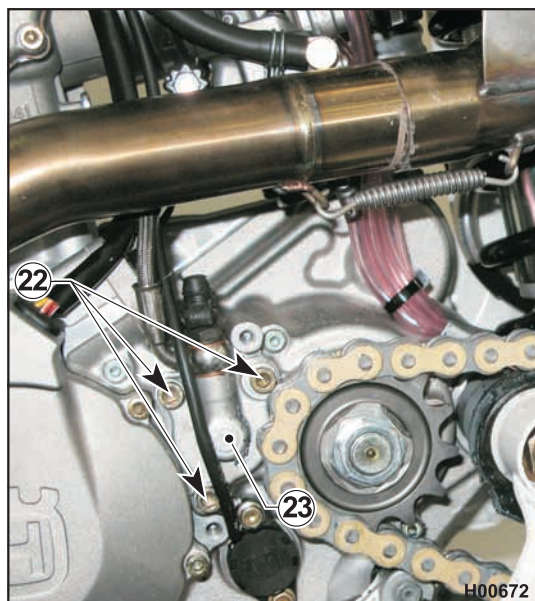


- Remove the chain guide plate (20) unscrewing the screw (21) with an 8 mm wrench.

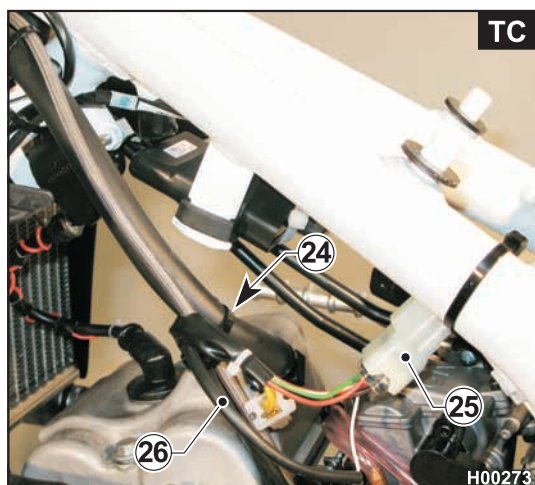




GENERAL PROCEDURES

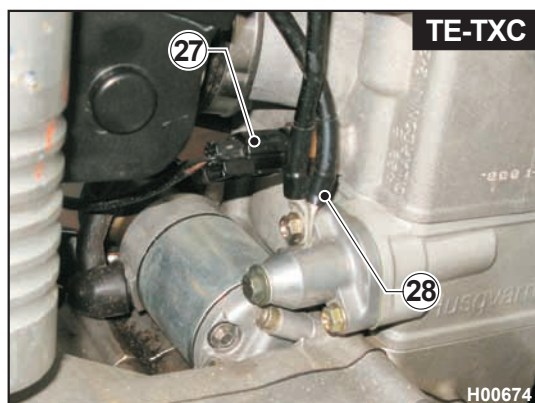


- Loosen the three screws (22) and remove the clutch actuator (23).



(TC)

- Remove the clip (24) that holds clutch hose and wiring harness together.
- Disconnect the connector (25) that connects wiring harness (26) to control unit.



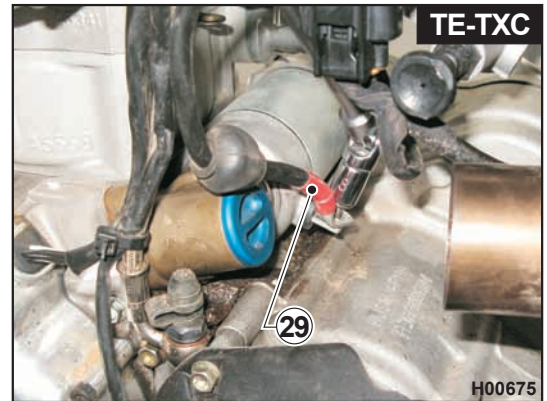
(TE-TXC)

- Remove the water temperature sensor connector (27).
- Remove the ground cables (28).

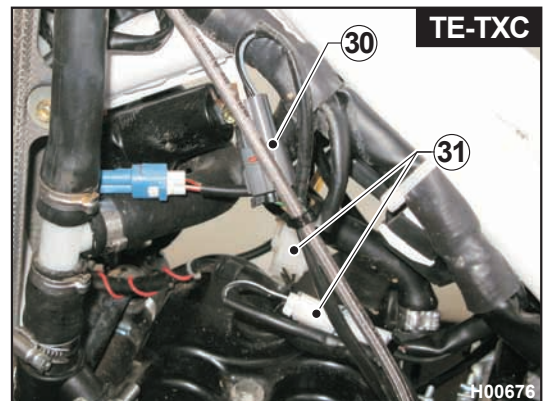




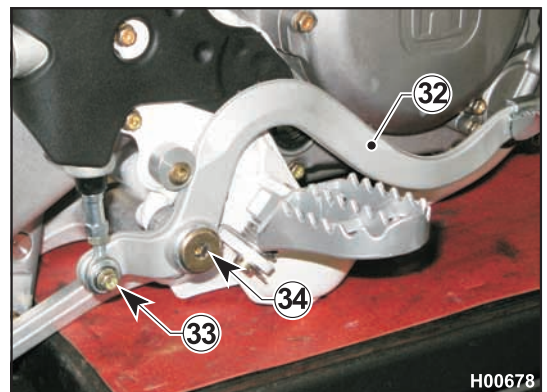
- Remove the positive power supply cable (29) of the starter motor.



- Disconnect the gear sensor connector (30) and the ignition connectors (31).
- Shear the clips securing engine wiring to chassis to release the wiring harnesses.

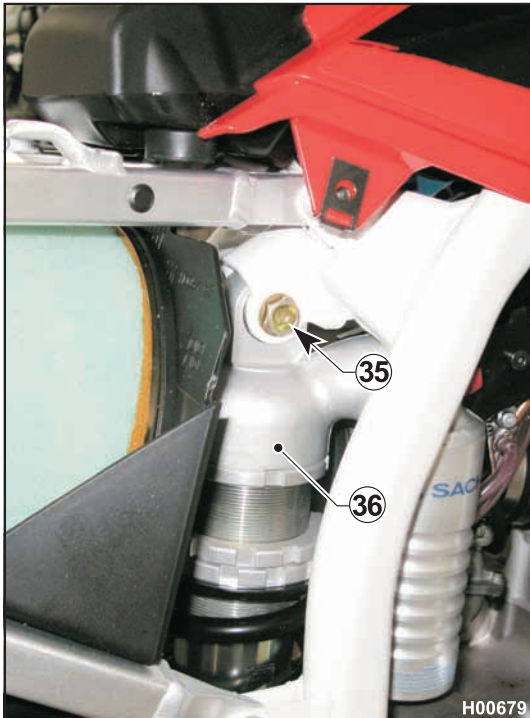


- To remove the brake lever (32), use an 8 mm wrench to loosen the master cylinder linkage (33) and a 6 mm Allen wrench to loosen the central screw (34). Remove the lever.

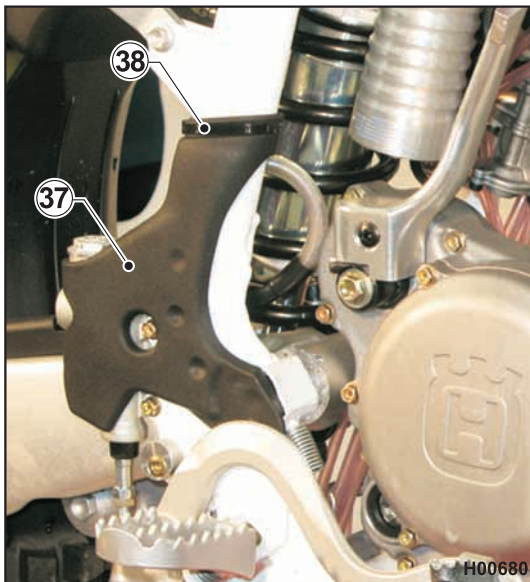




GENERAL PROCEDURES



- Loosen the upper retaining screw (35) of the shock absorber (36) with a 14 mm wrench.

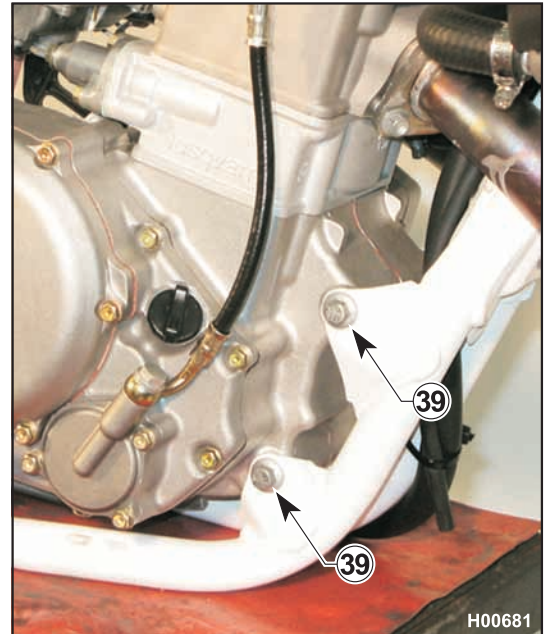


- Remove the guards (37) on both sides shearing the clips (38).

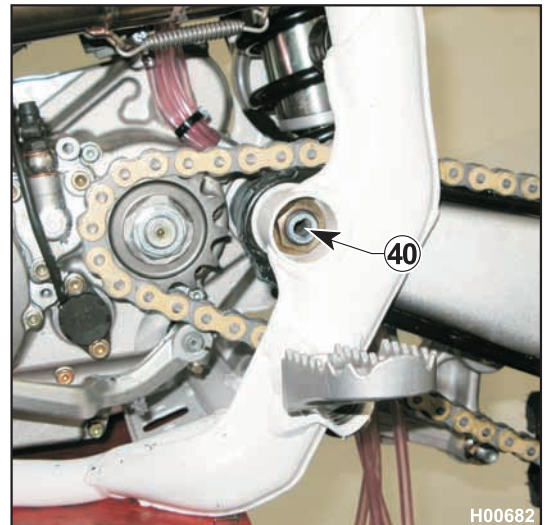




- Remove the engine mounting bolts (39) using a 12 mm wrench on the left-hand side and a 10 mm wrench on the right-hand side.

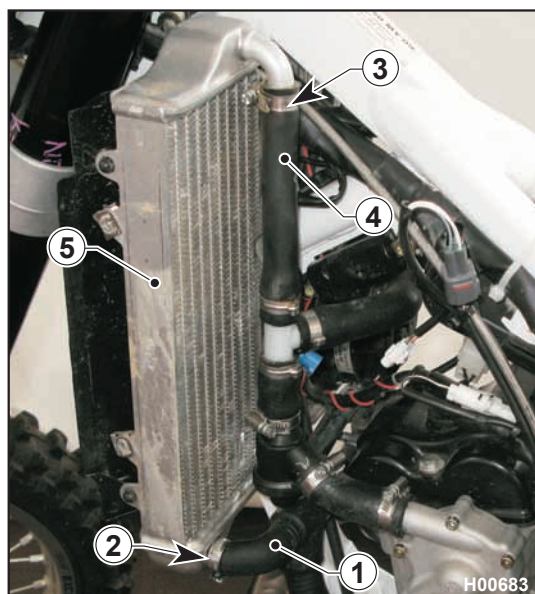


- Loosen the swinging arm axle nut (40) using a 22 mm wrench; pull out the axle from the right-hand side of the engine and pull the swinging arm rearwards to facilitate engine removal.
- Lift the engine, tilt it to the left and remove it from the motorcycle.
- Place the engine on a rotating stand to perform the procedures described in Sections F-G-H.



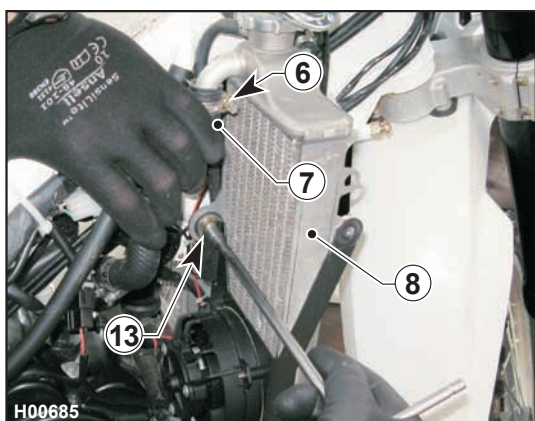


GENERAL PROCEDURES

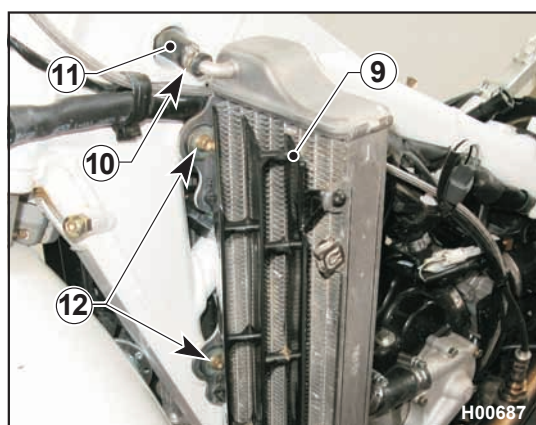


Radiator removal

- Remove the fuel tank together with scoops and spoilers as outlined in the relevant paragraphs.
- Remove the electric cooling fan (TE – TXC) as described in the relevant paragraph.
- Place a pan under the hose (1) to collect coolant, then loosen the clamp (2), detach the hose (1) and drain all coolant.
- Loosen the clamp (3) and disconnect the hose (4) from the left-hand radiator (5).

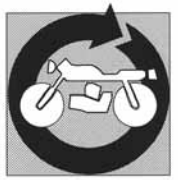


- Loosen the clamp (6) and disconnect the hose (7) from the right-hand radiator (8).

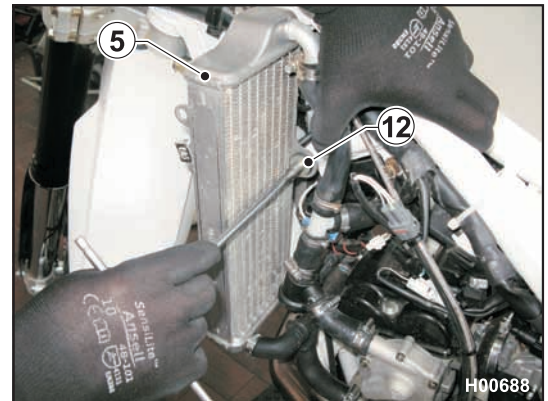


- Remove the plastic grids (9) from the radiators.
- Remove the clamp (10) and disconnect the radiator connecting hose (11).

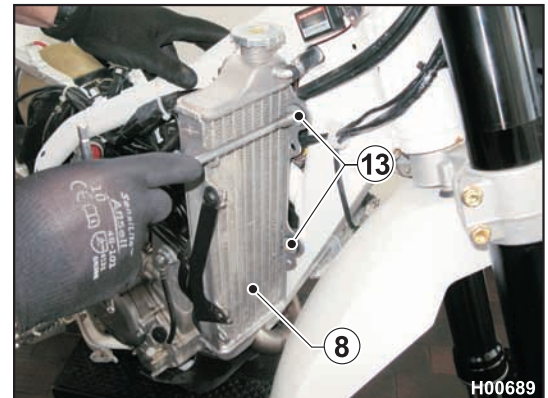




- Loosen the screws (12) and remove the left-hand radiator (5).

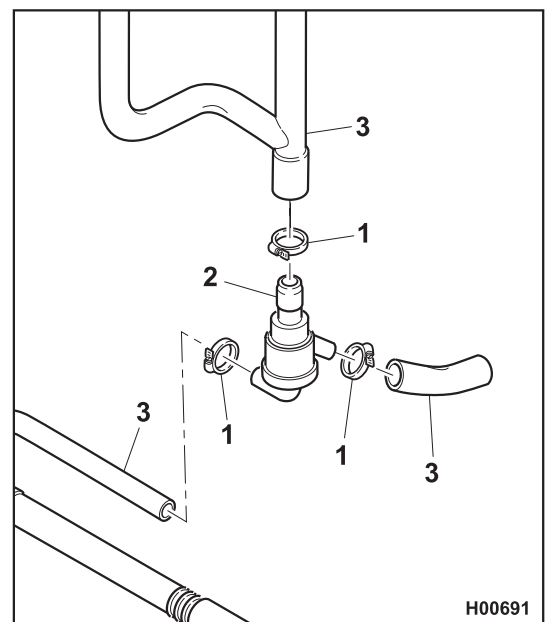
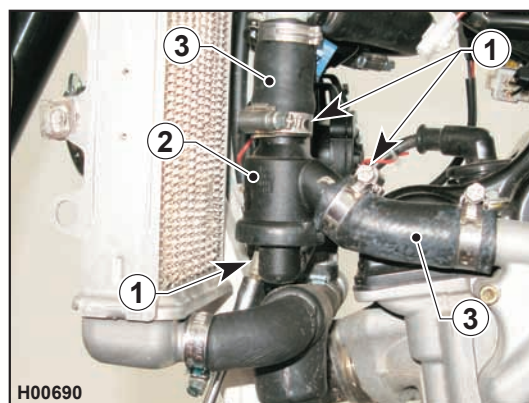


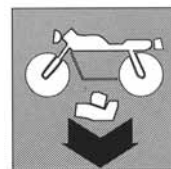
- Loosen the screws (13) and remove the right-hand radiator (8).



Thermostat removal (TE – TXC)

- Remove the fuel tank and the left-hand spoiler as outlined in the relevant paragraph.
- Loosen the three clamps (1) securing the thermostat (2).
- Disconnect the hoses (3) and remove the thermostat (2).

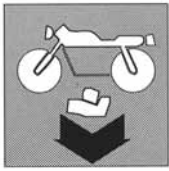




Section

F

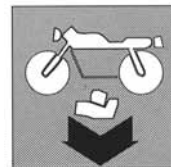




ENGINE DISASSEMBLY

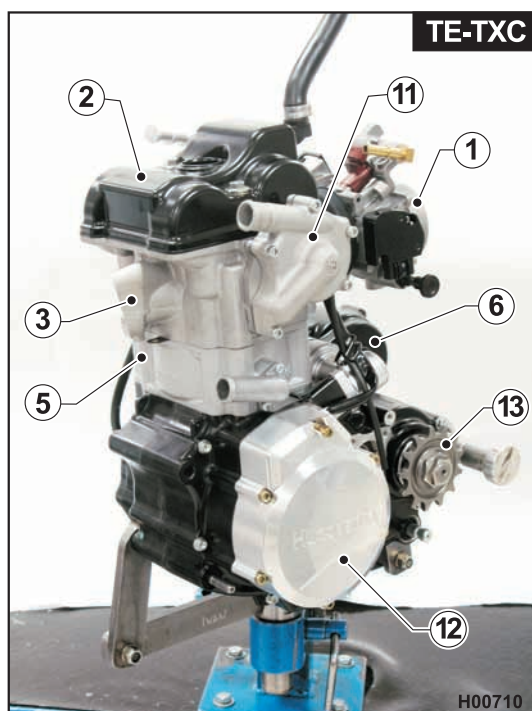
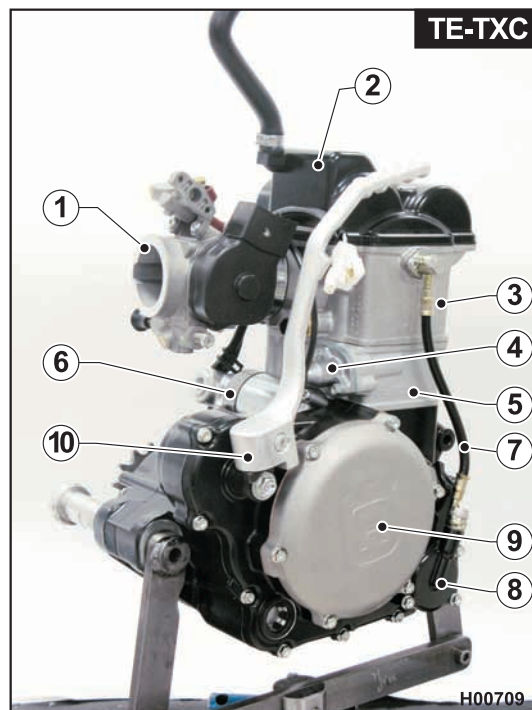
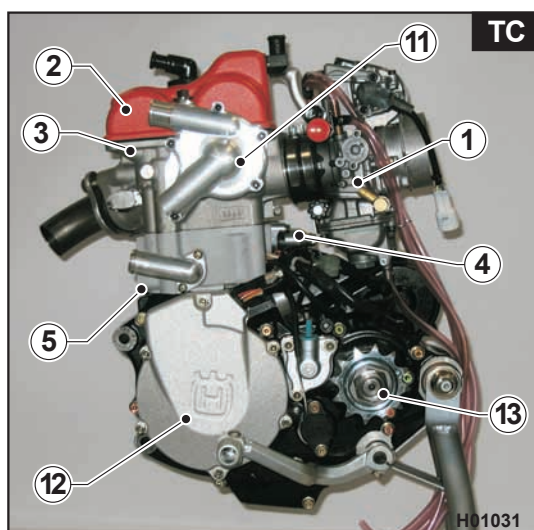
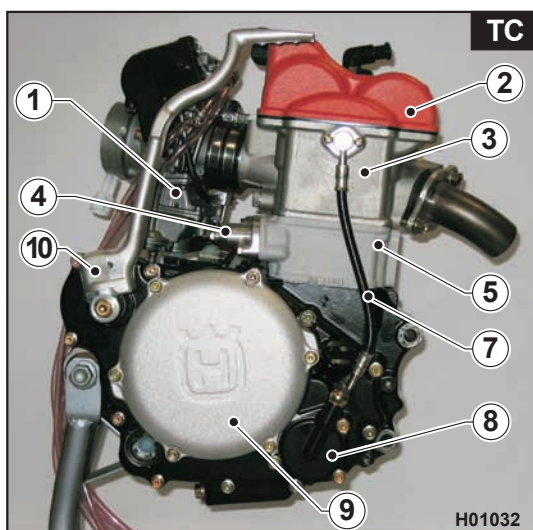
Layout of engine components	F.3
Cylinder head cover removal.....	F.4
Camshaft removal	F.4
Water pump body removal	F.8
Water pump disassembly	F.8
Cylinder head removal.....	F.10
Valve removal	F.12
Cylinder removal.....	F.14
Piston removal	F.14
Flywheel removal	F.15
Kick start pedal removal	F.16
Sprocket removal	F.16
Oil filter removal	F.18
Clutch cover removal.....	F.19
Clutch disassembly.....	F.20
Slider removal.....	F.23
Kick start disassembly	F.23
Starter motor removal (TE–TXC).....	F.25
Starter motor disassembly (TE–TXC).....	F.27
Starter drive disassembly (TE – TXC).....	F.27
Oil pump disassembly	F.30
Gear shift pedal and selector assembly removal.....	F.31
Primary drive gear removal	F.33
Crankcase disassembly.....	F.34
Gearbox disassembly.....	F.35
Crankshaft disassembly	F.37

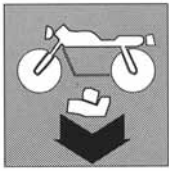




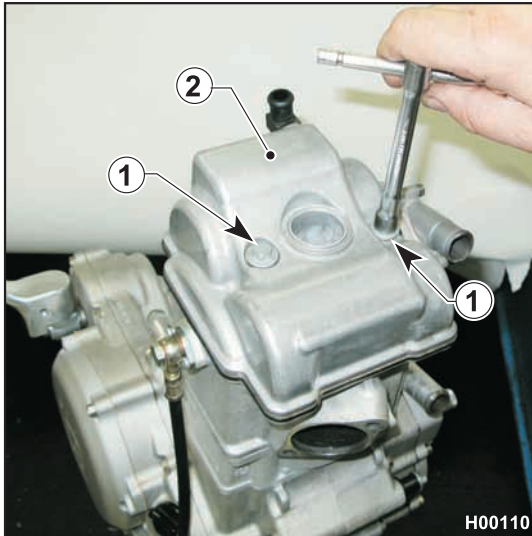
Layout of engine components

- 1 Throttle body (TE - TXC)
- Carburettor (TC)
- 2 Cylinder head cover
- 3 Cylinder head
- 4 Chain tensioner
- 5 Cylinder
- 6 Starter motor (TE - TXC)
- 7 Head lubrication pipe
- 8 Oil filter
- 9 Clutch cover
- 10 Kick start lever
- 11 Water pump
- 12 Alternator cover
- 13 Sprocket



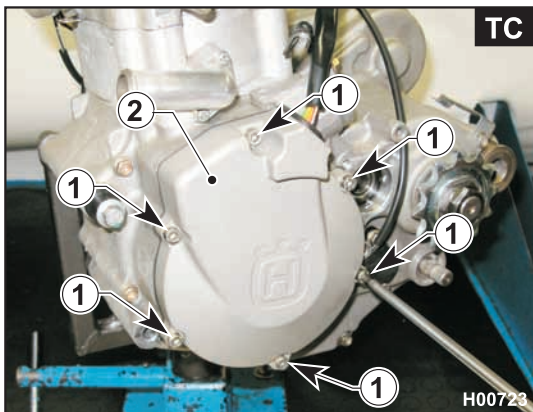


ENGINE DISASSEMBLY



Cylinder head cover removal

- Remove the two retaining screws (1) (10 mm wrench) and remove the head cover (2) with its gasket.

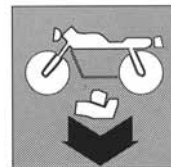


Camshaft removal

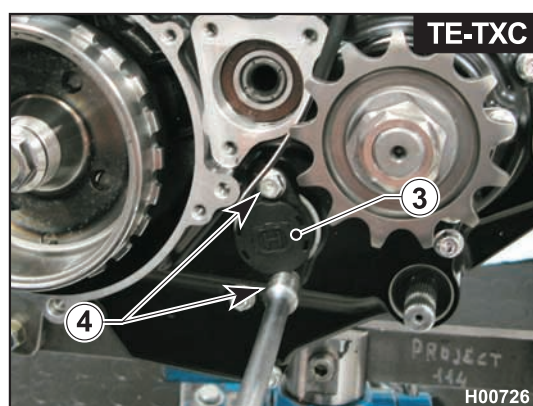
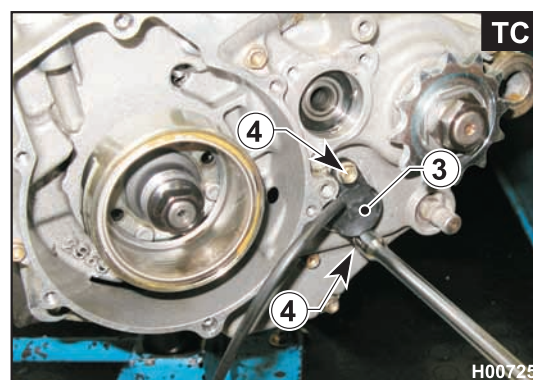
- Remove the six retaining screws (1) of the alternator cover (2) (4 mm Allen wrench) and remove the cover with its gasket.

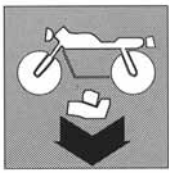


ENGINE DISASSEMBLY



- To remove the gear sensor (3), loosen the two screws (4) (8 mm wrench) and its pushrod and spring.

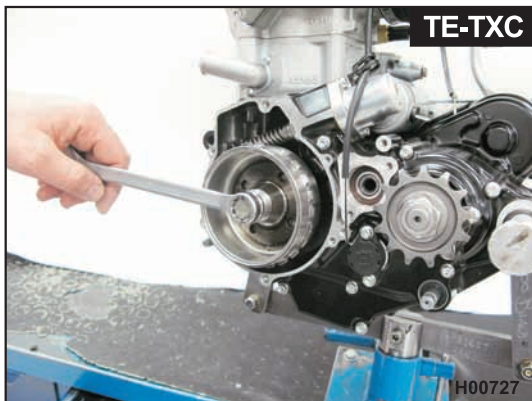




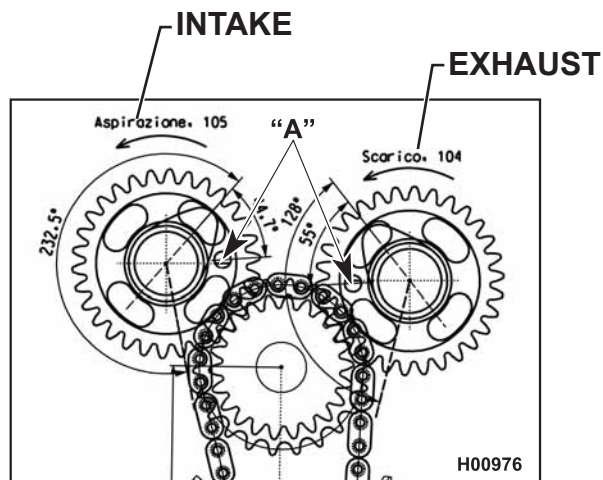
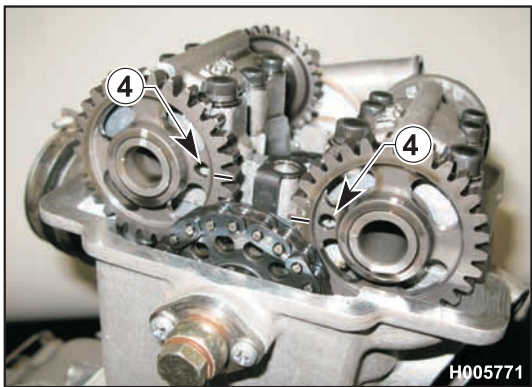
ENGINE DISASSEMBLY



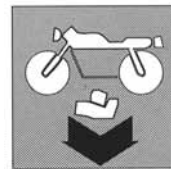
- Using a 17 mm wrench, bring the piston to T.D.C. at the end of the compression stroke (in this condition, the two holes (5) and the two marks (6) on the gears must be positioned as shown in the figure).



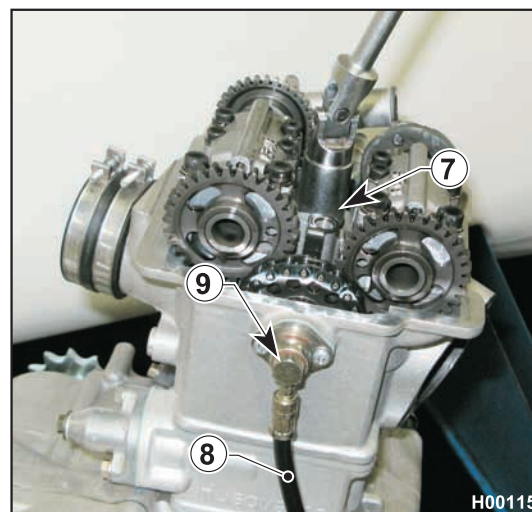
Cover parting line "A" is visible through the holes (4).



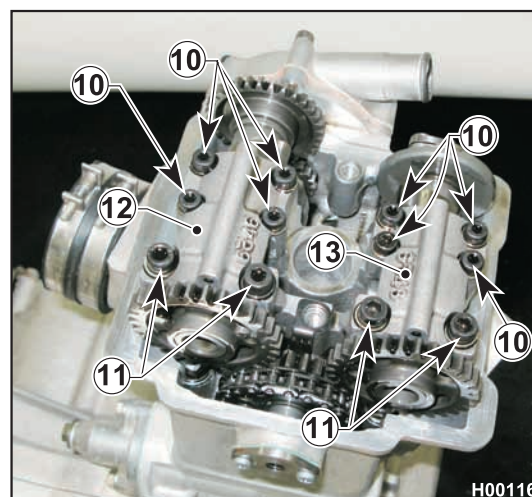
ENGINE DISASSEMBLY



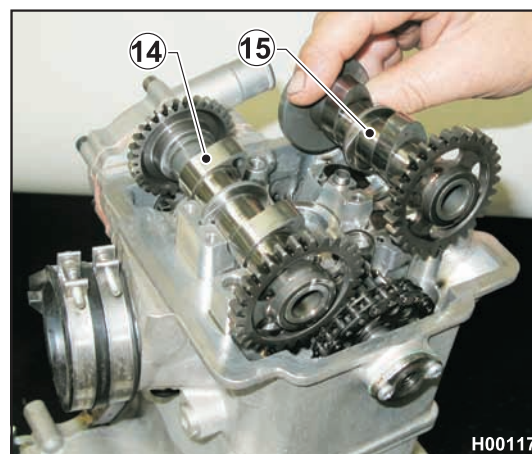
- Remove the spark plug (7) (16 mm wrench) and the head lubrication pipe (8) unscrewing the drilled screw (9) (12 mm wrench).

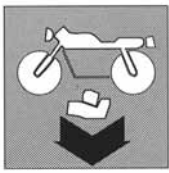


- Remove the screws (10) (4 mm wrench) and the screws (11) (5 mm wrench) from both clamps (12) and (13) and remove them.

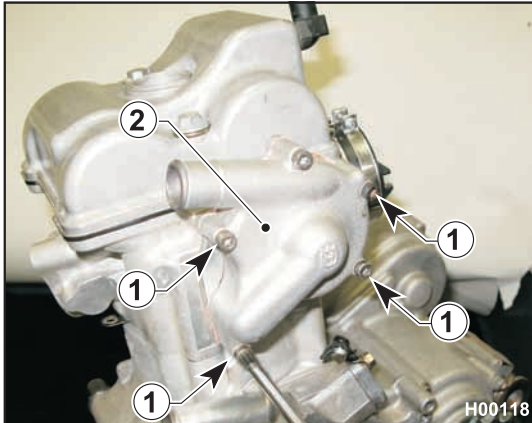


- Remove the intake camshaft (14) and the exhaust camshaft (15).



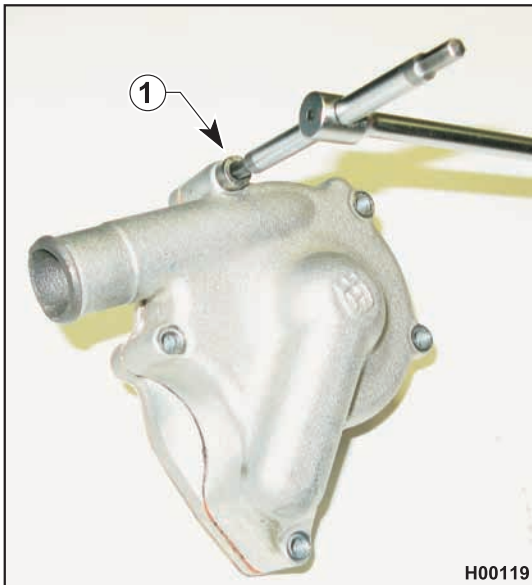


ENGINE DISASSEMBLY



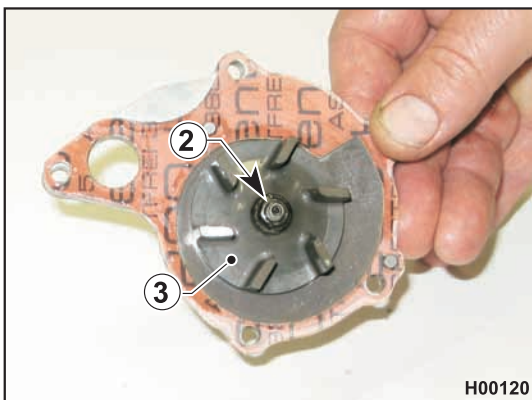
Water pump body removal

- Remove the four screws (1) securing pump body (2) to head (4 mm Allen wrench) and remove pump body.



Water pump disassembly

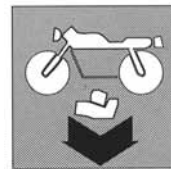
- Loosen the screw (1) to disassemble the pump.



- Loosen the nut (2) to remove the impeller (3).



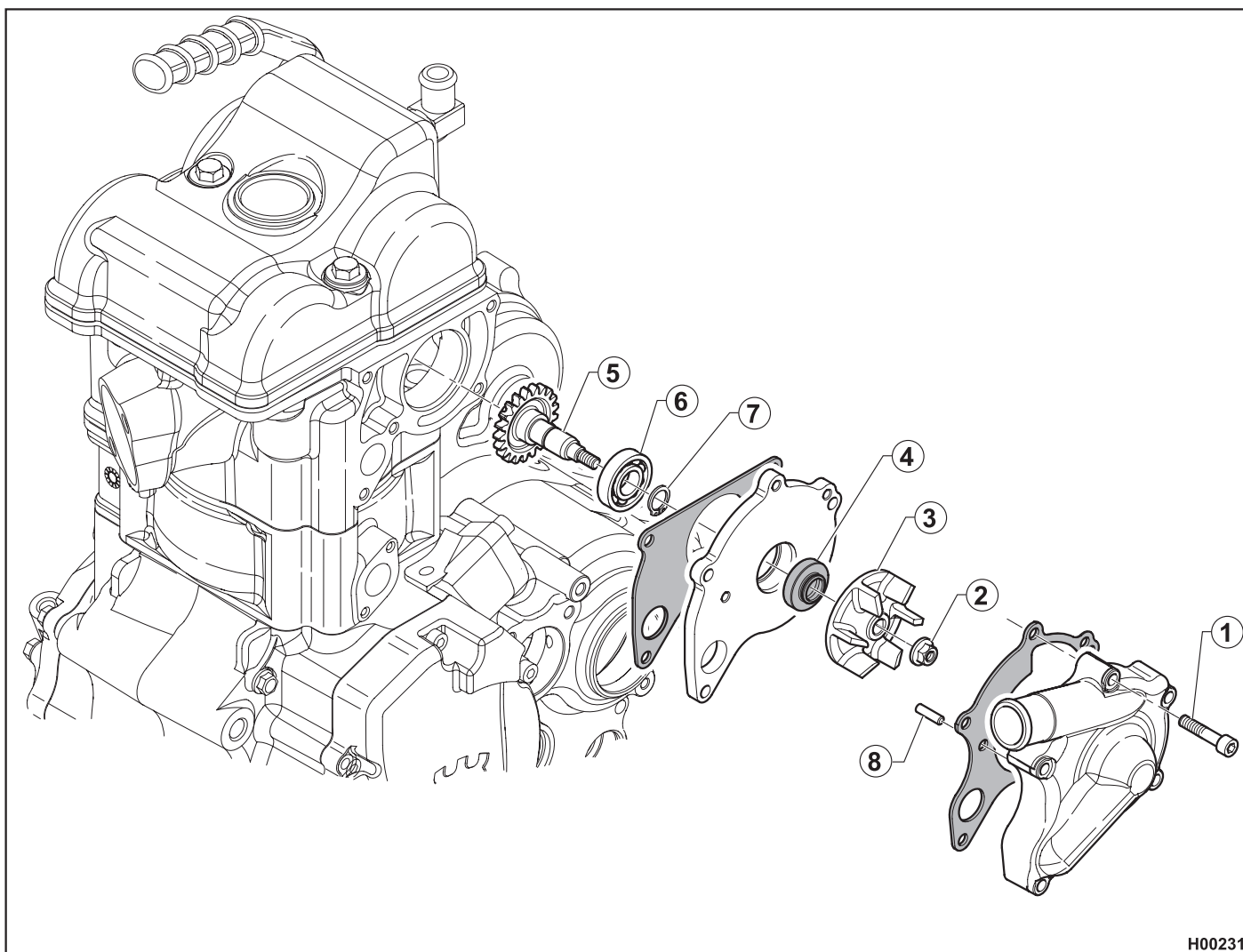
ENGINE DISASSEMBLY



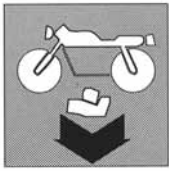
- Remove the oil seal (4) and slide off the gear (5) together with the bearing (6).
- Remove the circlip (7) and remove the bearing (6) from the gear (5).



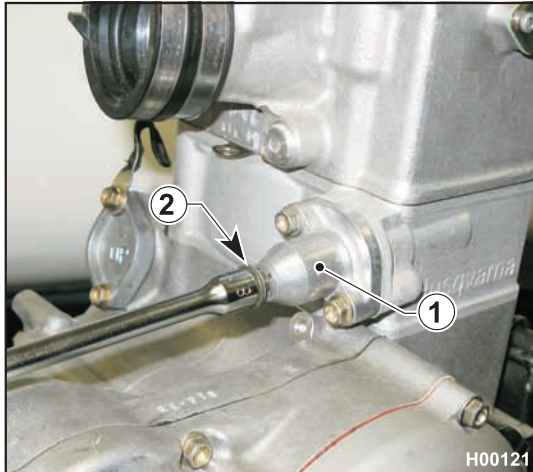
On assembly, make sure the centring pins (8) are correctly located in their seats.



H00231

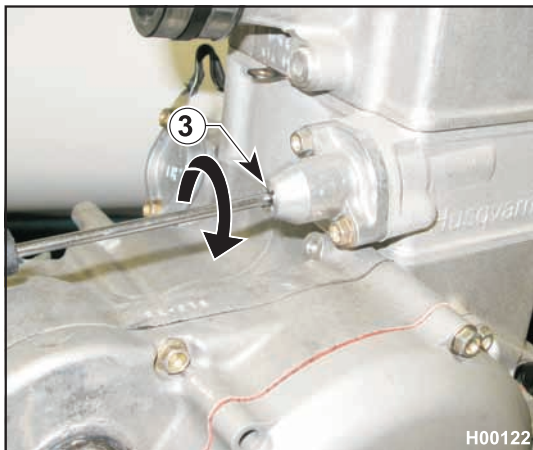


ENGINE DISASSEMBLY

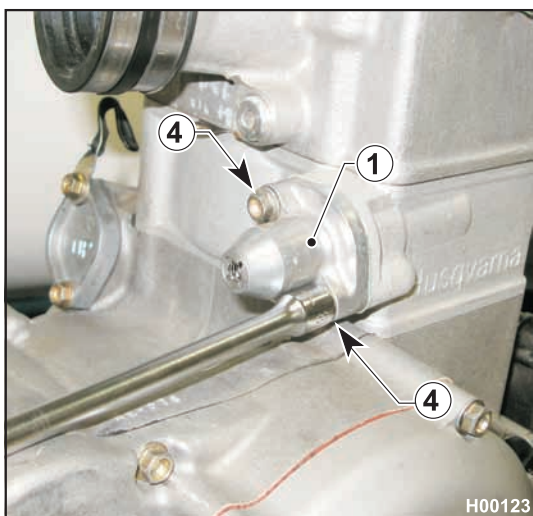


Cylinder head removal

- Remove the head cover as described in the relevant paragraph.
- Remove the camshafts as described in the relevant paragraph.
- Remove the chain tensioner (1) as follows:
 - Loosen the screw (2) with an 8 mm wrench.



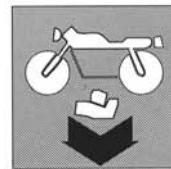
- Turn the screw (3) fully clockwise with a flat head screwdriver until locking it so as to release the spring.



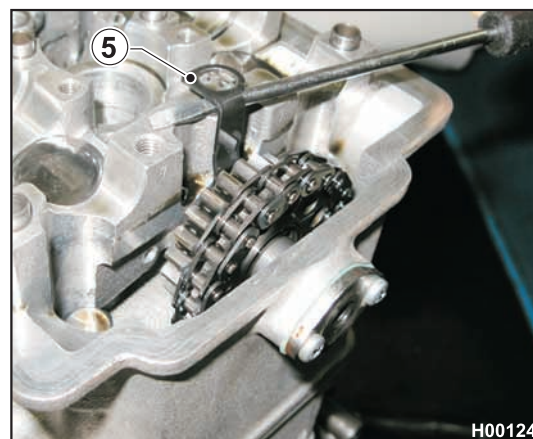
- Loosen the two screws (4) using an 8 mm wrench and remove the chain tensioner (1).



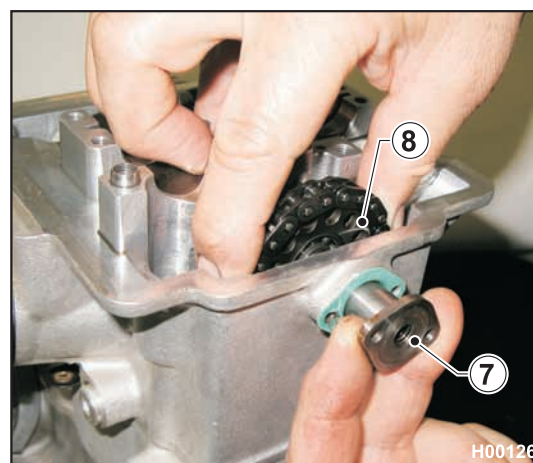
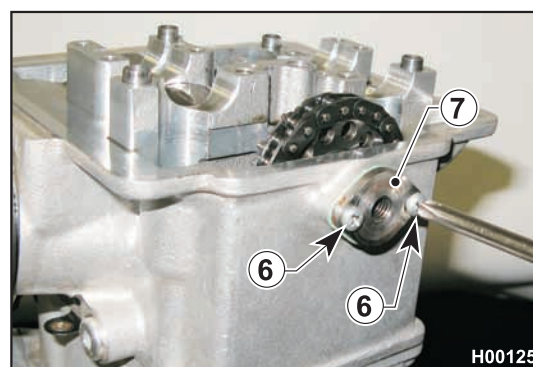
ENGINE DISASSEMBLY



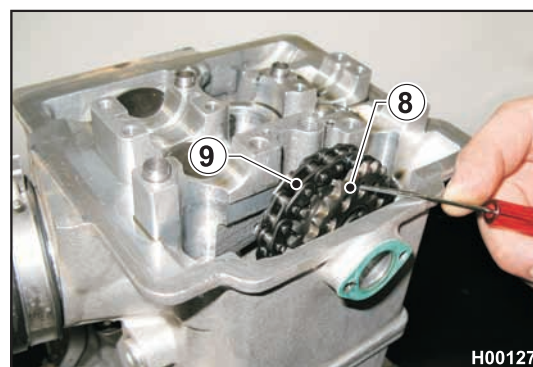
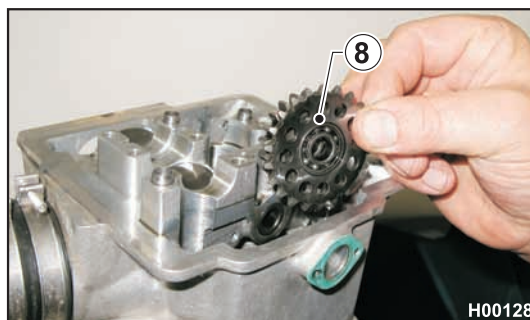
- Remove the timing gear retaining clip (5) using a screwdriver.

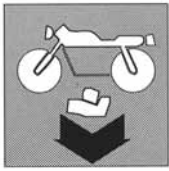


- Loosen the two screws (6) using a Phillips screwdriver and remove the timing drive shaft (7) while holding the gear (8) with your hand.

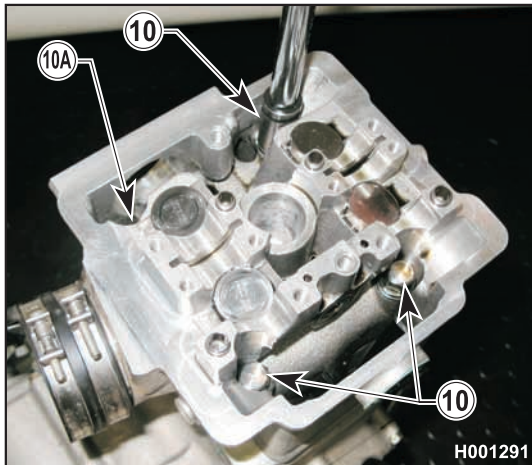


- Support the gear (8) using a screwdriver or a punch, unwrap the chain (9) and remove the gear. Let the chain drop into the engine.

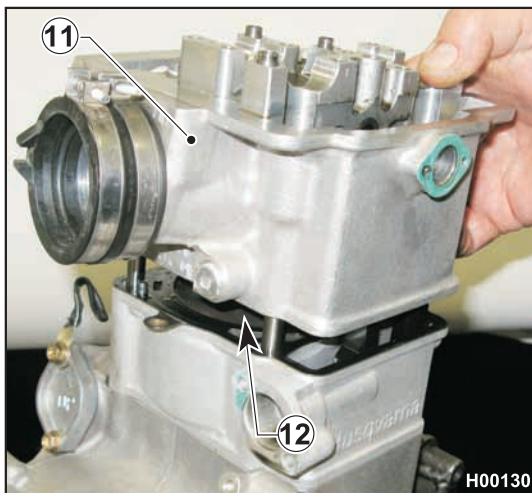




ENGINE DISASSEMBLY



- Loosen the four head bolts (10) using a 12 mm socket wrench. Mark each bolt with its position to avoid confusing them on assembly (three bolts are 112.5 mm long, one (10A) is 104.5 mm long).



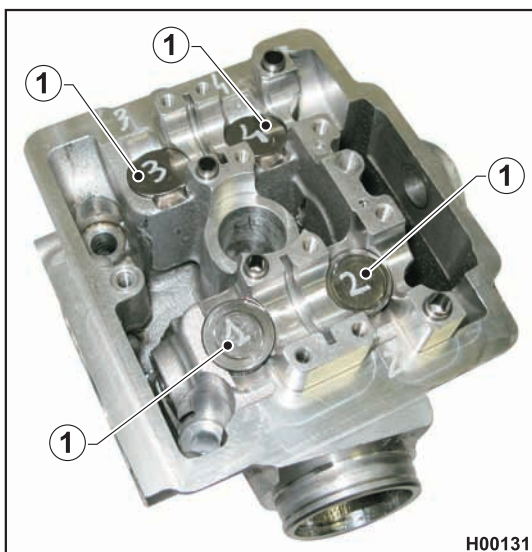
- Remove the cylinder head (11) and its gasket (12).



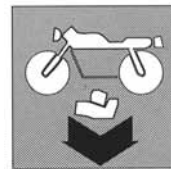
Be careful not to lose the locating pins positioned between head and cylinder.

Valve removal

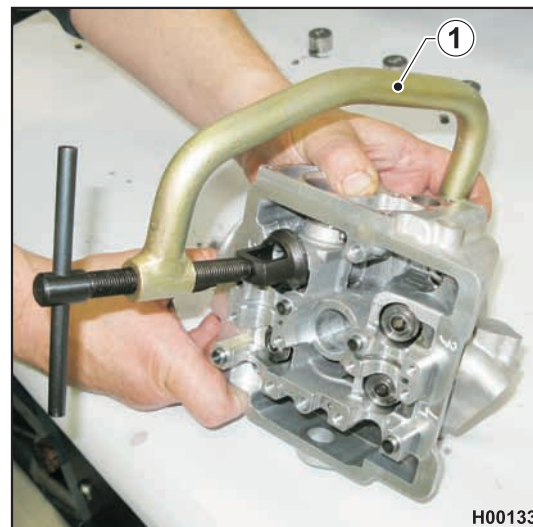
- Remove the four valve buckets (1) and the shims (2). Mark them with their positions to ensure correct assembly in the original position.



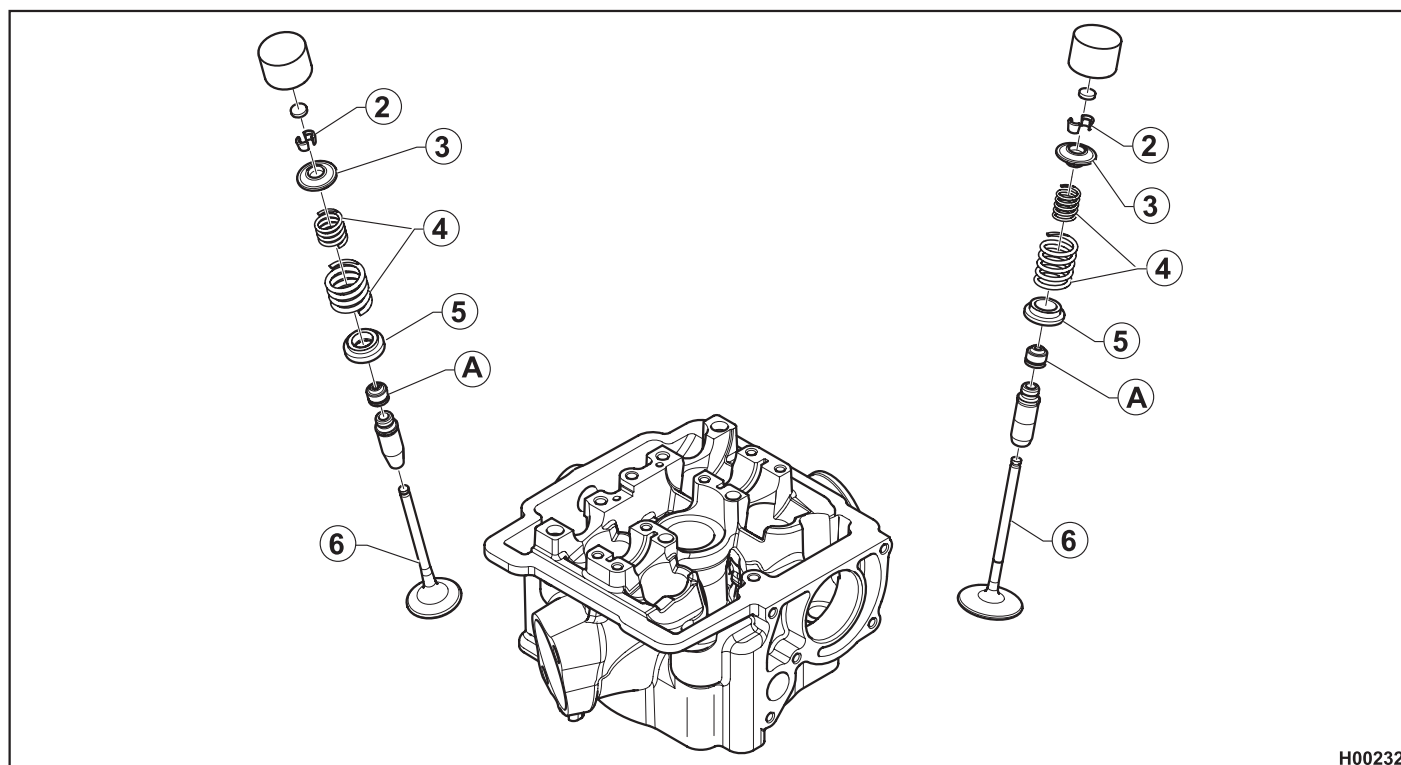
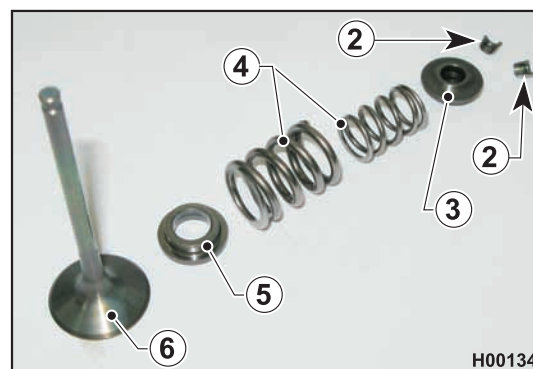
ENGINE DISASSEMBLY

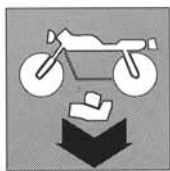


- Use a valve spring compressor to compress the valve springs. Be careful not to damage the mating surfaces that contact the gasket or those of the combustion chamber. Make sure the valve spring compressor is aligned straight on the spring, or you might bend the valve stem. Do not compress the springs too much or they will weaken.
- Mark all parts to ensure that they are refitted in their original positions on assembly. If the valve collets have caused burrs on the valve stems, remove them before removing the valves.
- Remove the seals (A) from the valve guides.
- Remember that seals must be replaced on assembly.
- Compress the springs using the valve spring compressor (1).
- Remove valve collets (2), spring retainers (3), springs (4), spring seats (5) and remove the valve (6) from the opposite end.



Intake and exhaust valves are different, be careful not to confuse them on assembly.



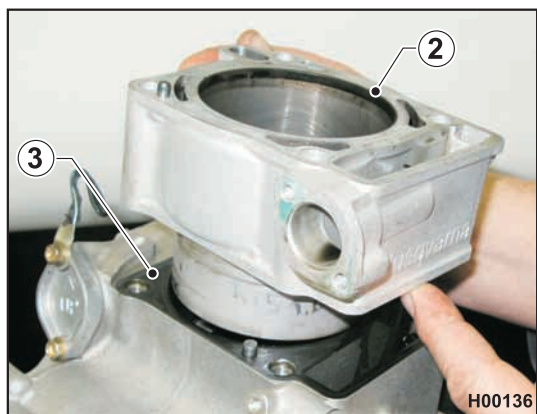


ENGINE DISASSEMBLY

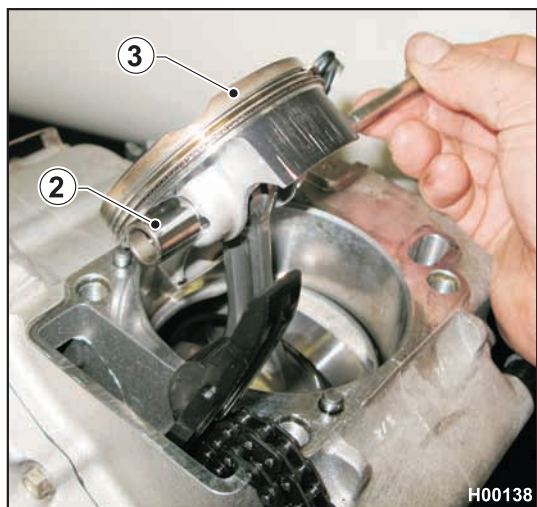


Cylinder removal

- Remove the front slider (1) of the timing chain pulling it upwards.

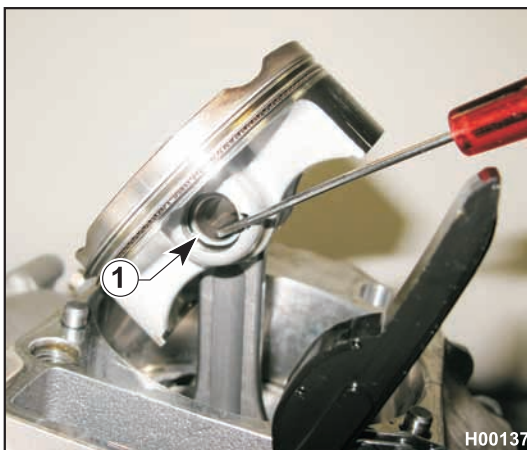


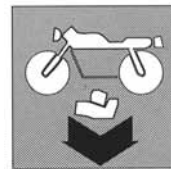
- Remove the cylinder (2) with its gasket (3).



Piston removal

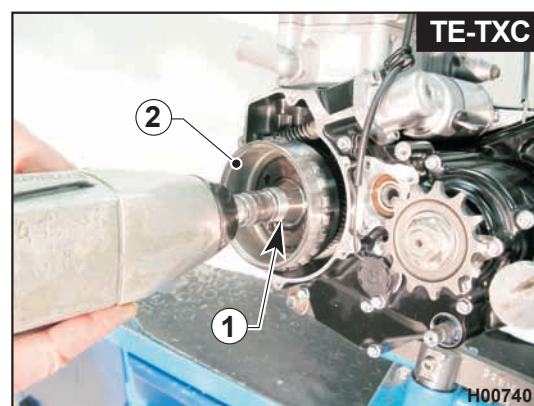
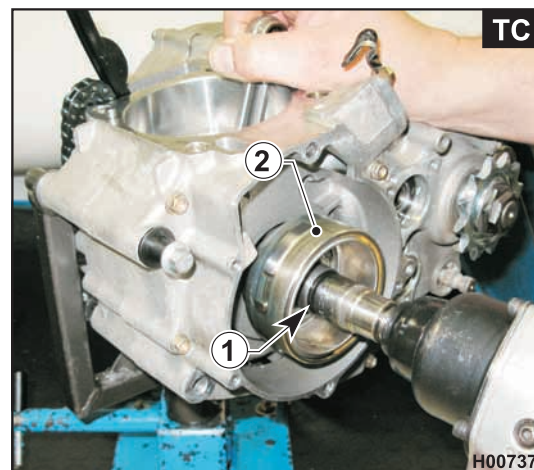
- Remove the piston pin retaining rings (1), slide out the piston pin (2) and remove the piston (3).



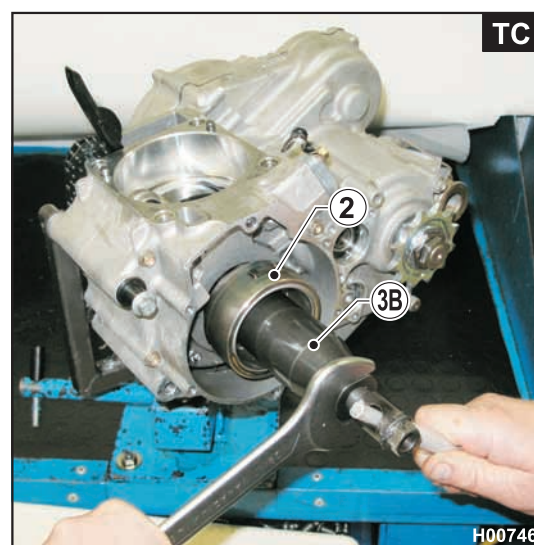
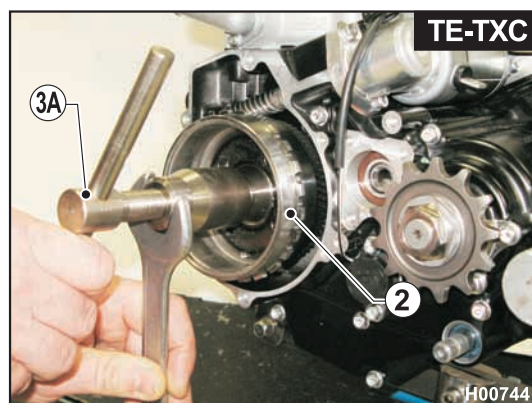


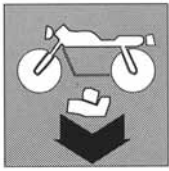
Flywheel removal

- Loosen the rotor (2) nut (1) (17 mm wrench).

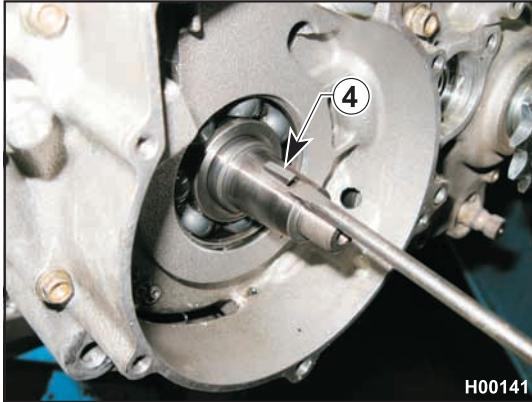


- Remove the rotor (2) using the puller (3A) (part no. 8000 H2146) and the puller (3B) (part no. 8000 H1559).

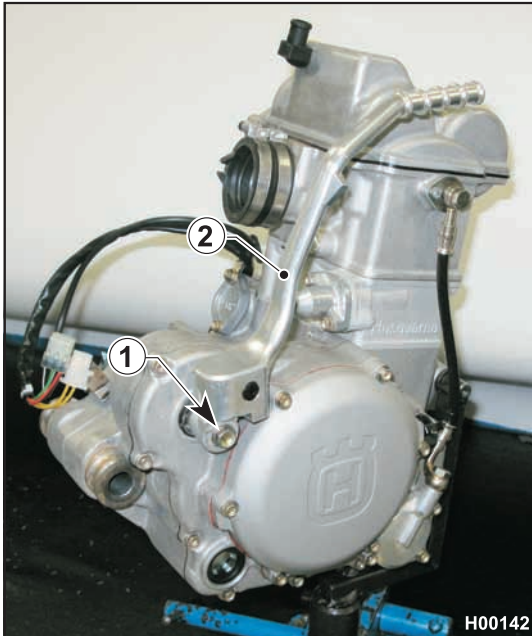




ENGINE DISASSEMBLY

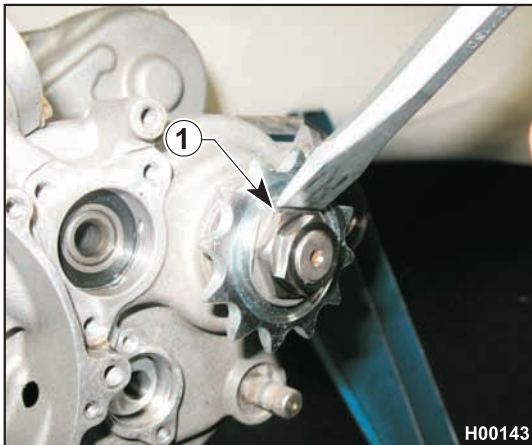


- Remove the key (4) from the crankshaft.



Kick start pedal removal

- Remove the pedal retaining bolt (1) (12 mm wrench), the washer and the pedal (2).

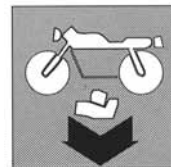


Sprocket removal

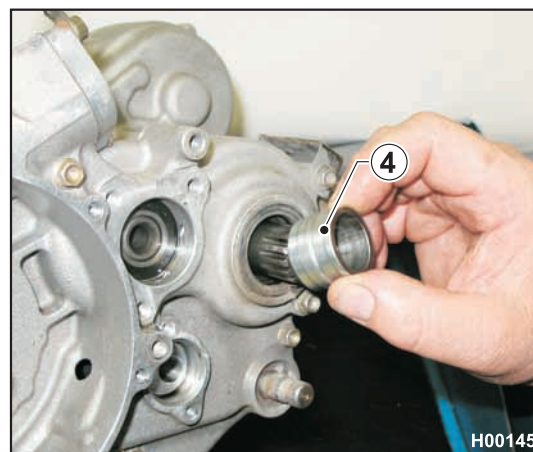
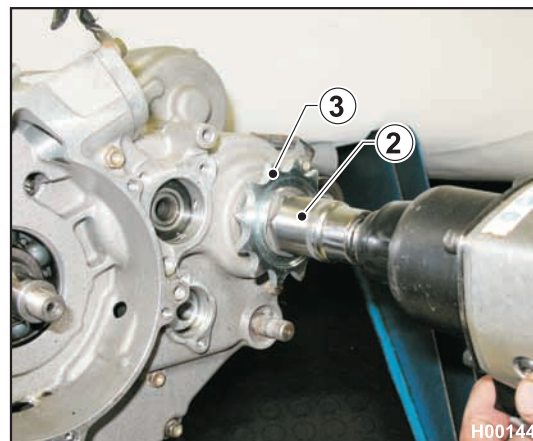
- Lift the tab of the lock washer (1) using a chisel.

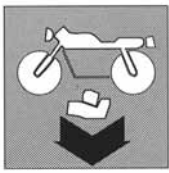


ENGINE DISASSEMBLY

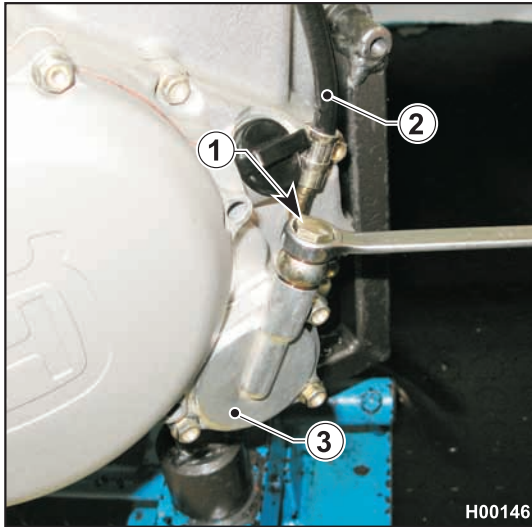


- Loosen the nut (2) using a 22 mm wrench and remove sprocket (3) and spacer (4).



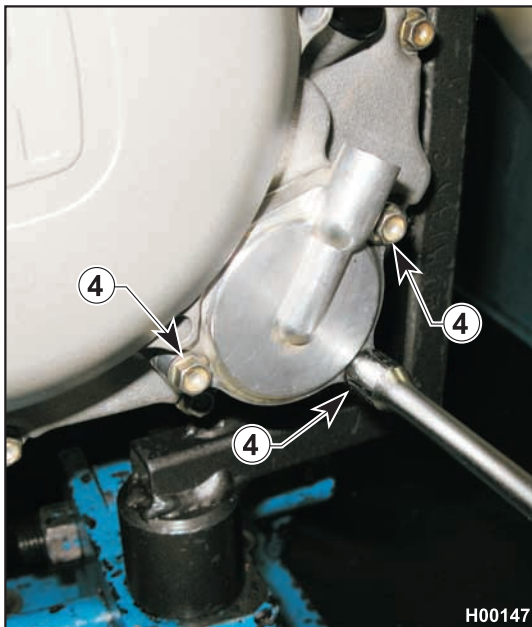


ENGINE DISASSEMBLY

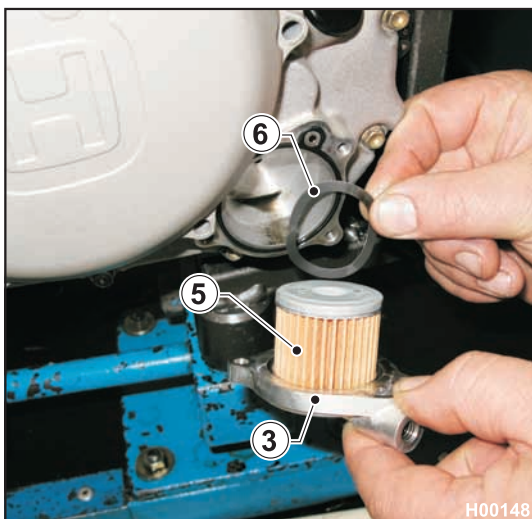


Oil filter removal

- Loosen the drilled nut (1) and disconnect the hose (2) from the oil pump cover (3).

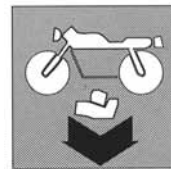


- Loosen the three screws (4) using an 8 mm wrench.



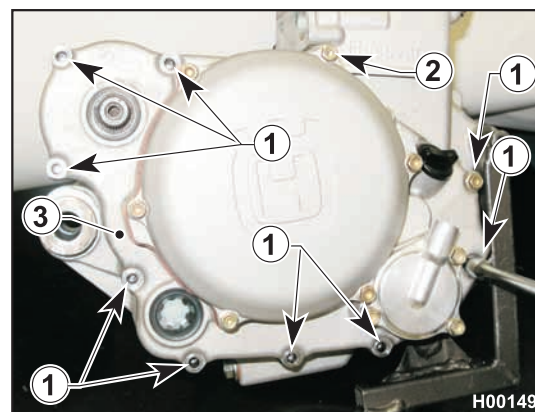
- Remove the cover (3) together with its filter (5) and Belleville washer (6).



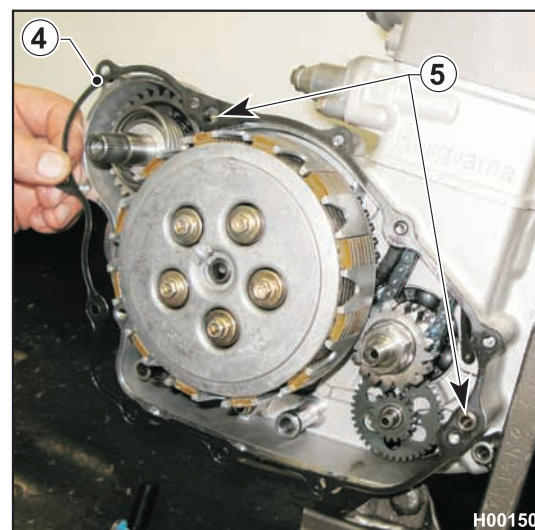


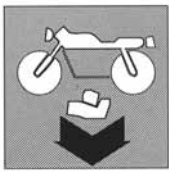
Clutch cover removal

- Remove the nine screws (1) and the screw (2) securing the cover (3) (8 mm wrench) and remove the cover (3).

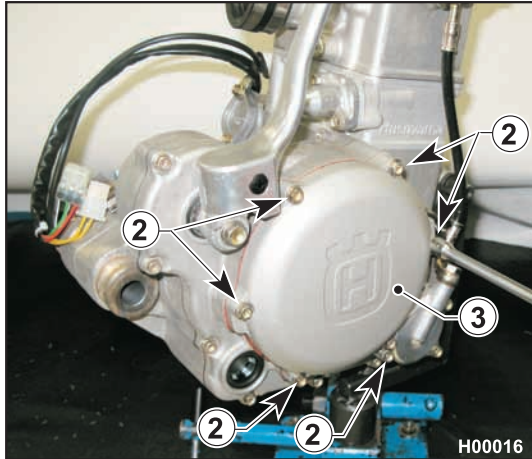


- Remove the gasket (4) and the bushings (5).



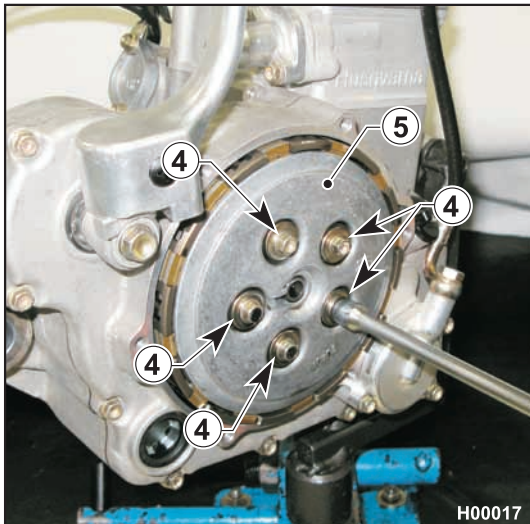


ENGINE DISASSEMBLY

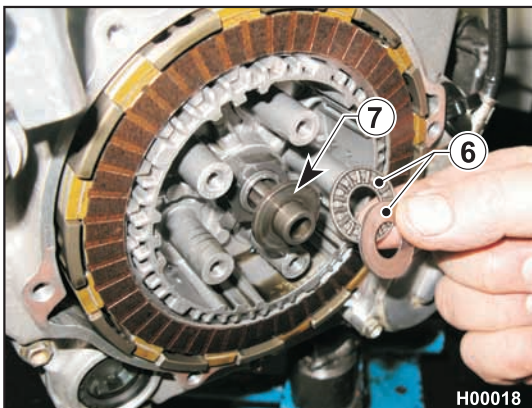


Clutch disassembly

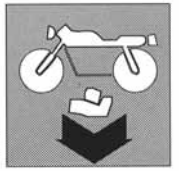
- Remove the six retaining screws (2) and the clutch cover (3).



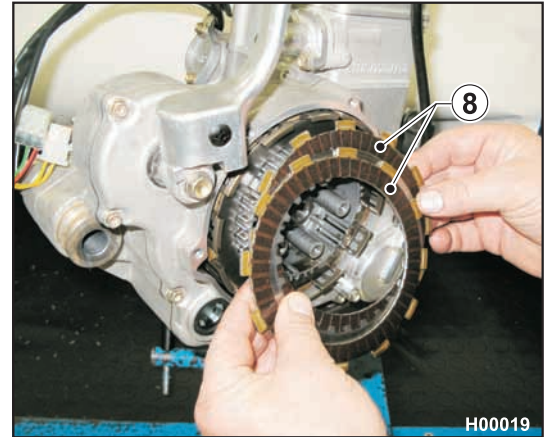
- Using an 8 mm wrench, unscrew the six screws (4) securing the clutch springs. Remove springs, pressure plate (5) with bearing (6) and clutch actuator plate (7).



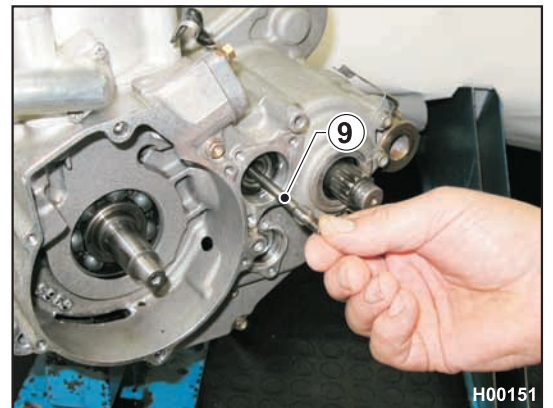
ENGINE DISASSEMBLY



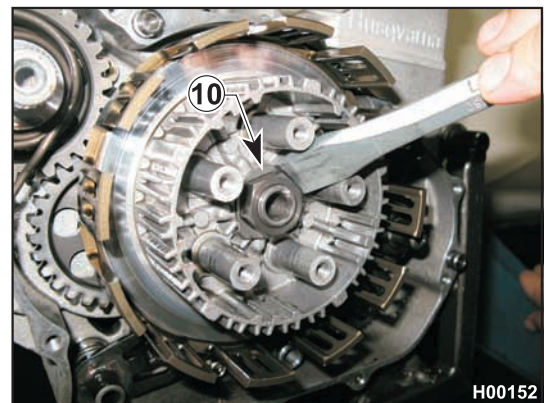
- Remove the plates (8), lubricate the new plates with engine oil and install them (always start with a friction plate).

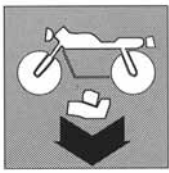


Remove the clutch pushrod (9) from the opposite side of the engine.

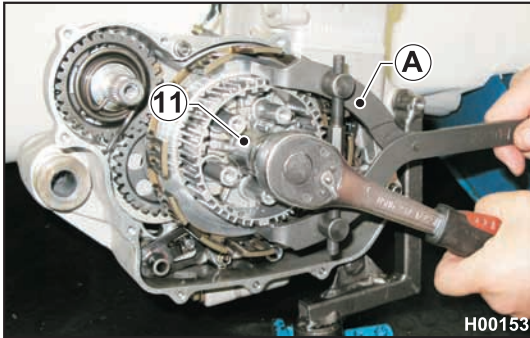


Straighten the tab of the lock washer (10).

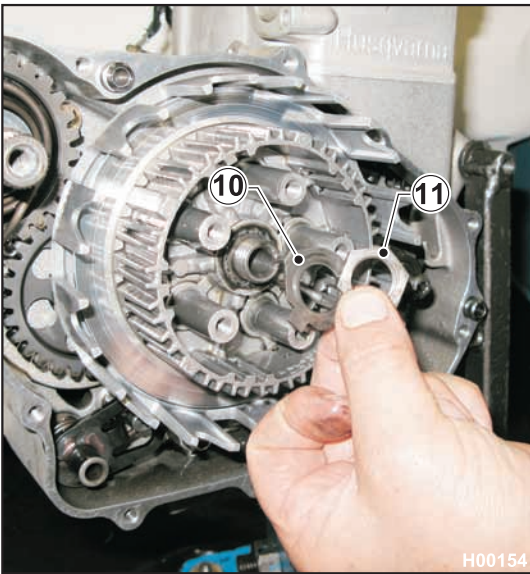




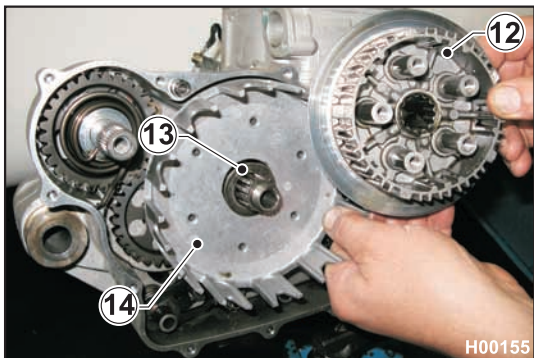
ENGINE DISASSEMBLY



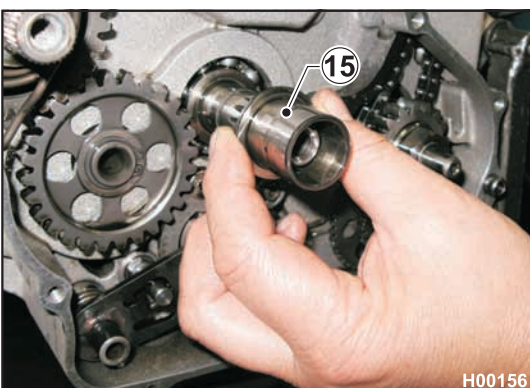
- Remove the nut (11) (22 mm wrench) using the clutch removal tool (A) (part no. 8000 79015).



- Remove the washer (10).

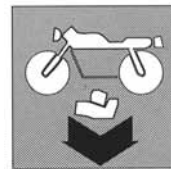


- Remove hub (12), washer (13) and clutch housing (14).



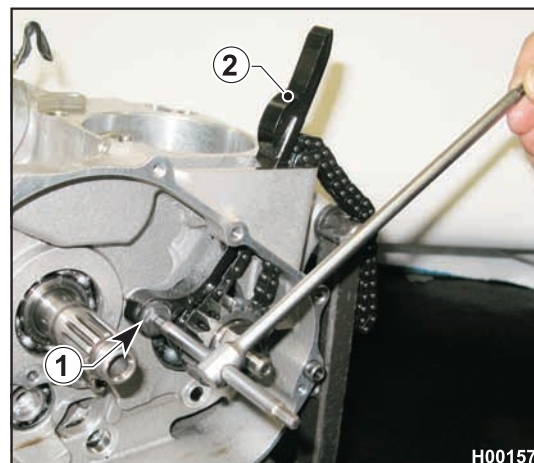
- Remove the bushing (15).





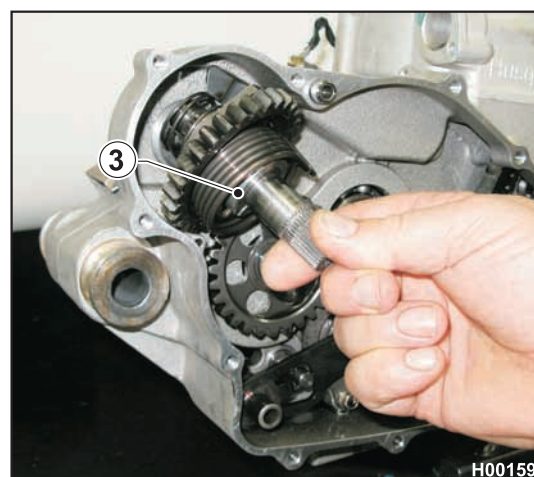
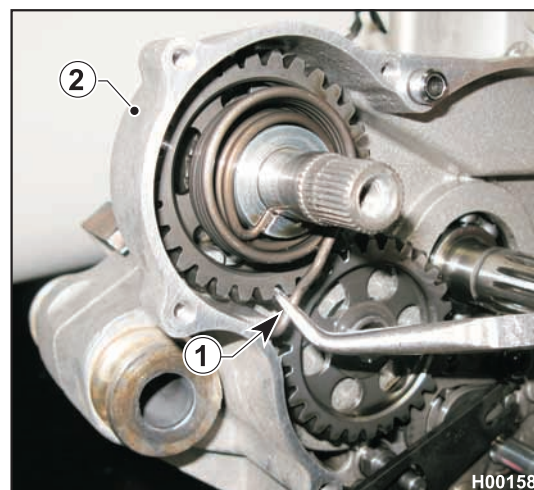
Slider removal

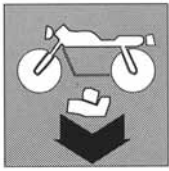
- Use a 5 mm Allen wrench to loosen the screw (1) and remove the slider (2).



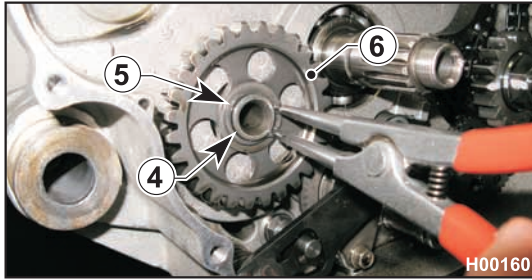
Kick start disassembly

- Release the spring (1) from the casing (2) and remove the complete shaft assembly (3). Be careful not to lose the washer (11) located on the crankcase.

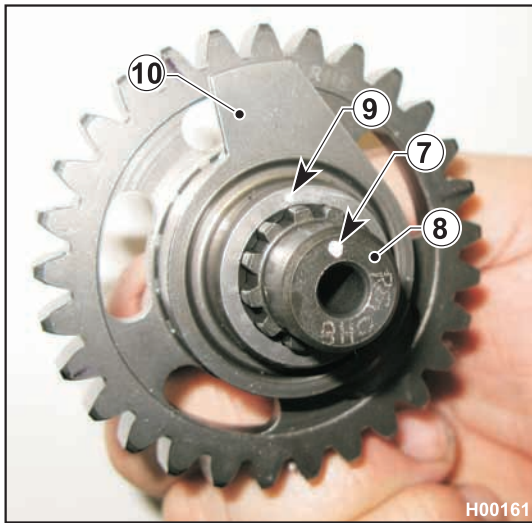




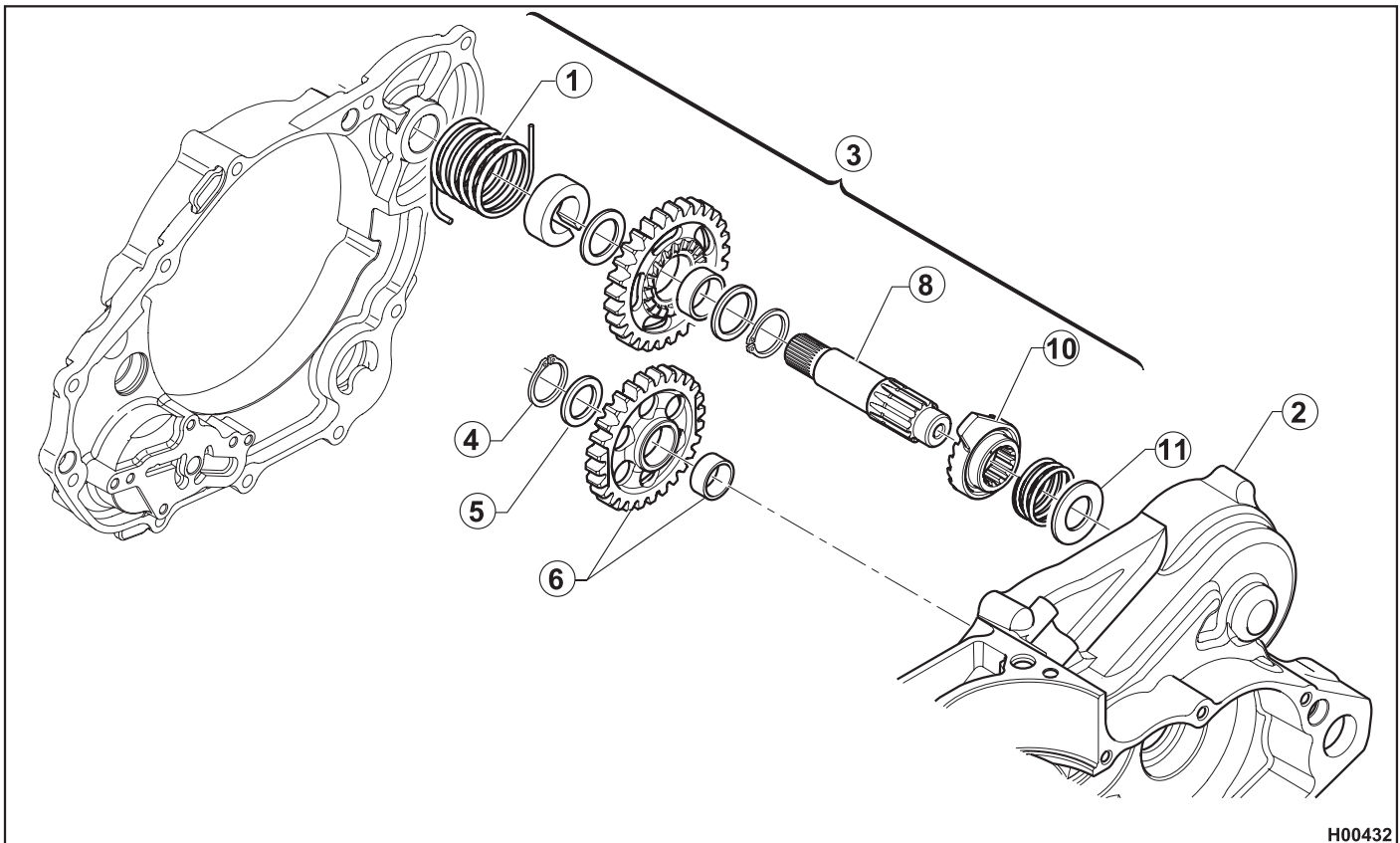
ENGINE DISASSEMBLY

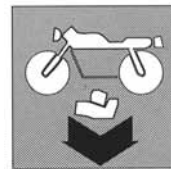


- Remove the snap ring (4), the washer (5) and the timing drive gear (6).



- Disassemble the shaft as shown in the diagram. On assembly, make sure that the dot (7) on shaft end (8) and the dot (9) on the ratchet (10) are aligned.



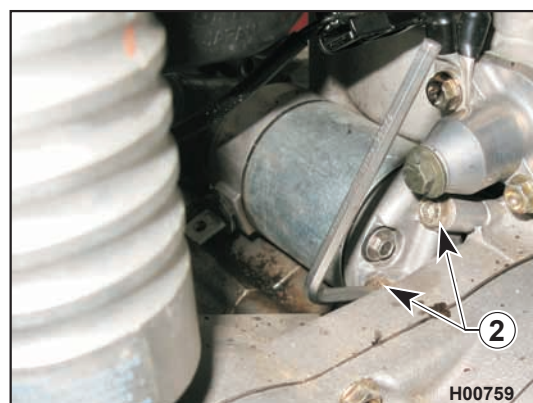
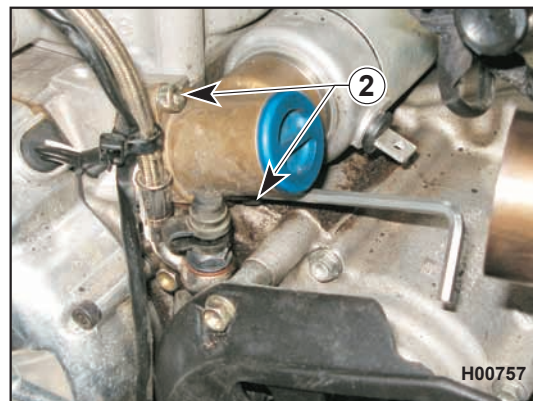


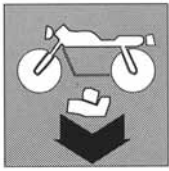
Starter motor removal (TE – TXC)

- Remove the exhaust pipe as described in the relevant paragraph.
- Disconnect the positive power supply cable (1) loosening the hexagonal-head screw (8 mm wrench).

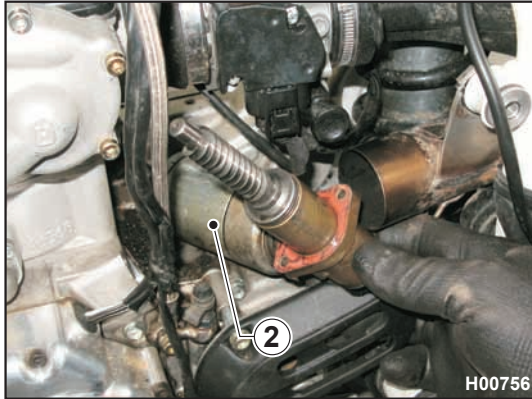


- Unscrew the four screws (2) using a 4 mm Allen wrench.

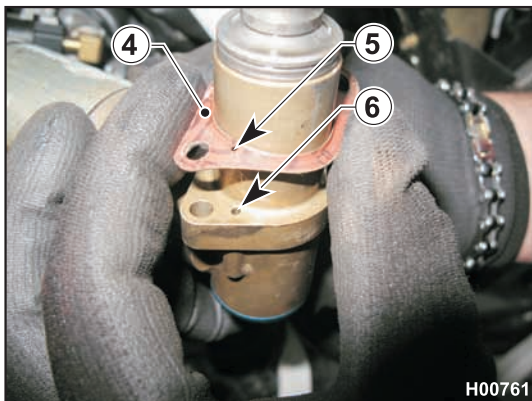
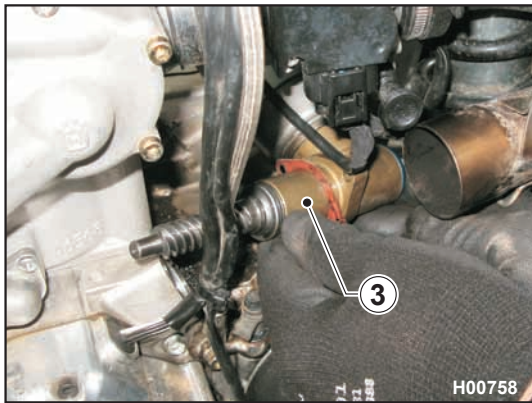




ENGINE DISASSEMBLY



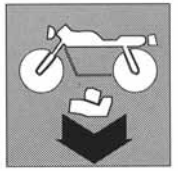
- Slide the starter motor (3) towards the rear end of the motorcycle to remove it.



WARNING

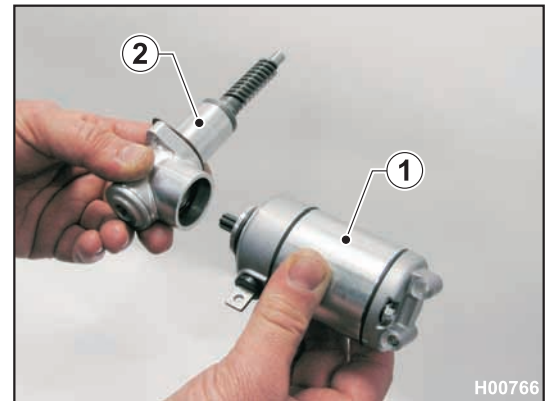
Upon assembly, check the gasket (4) for damage and replace it if needed. Make sure to position it correctly with the gasket hole (5) matching the hole (6) in the starter motor flange.



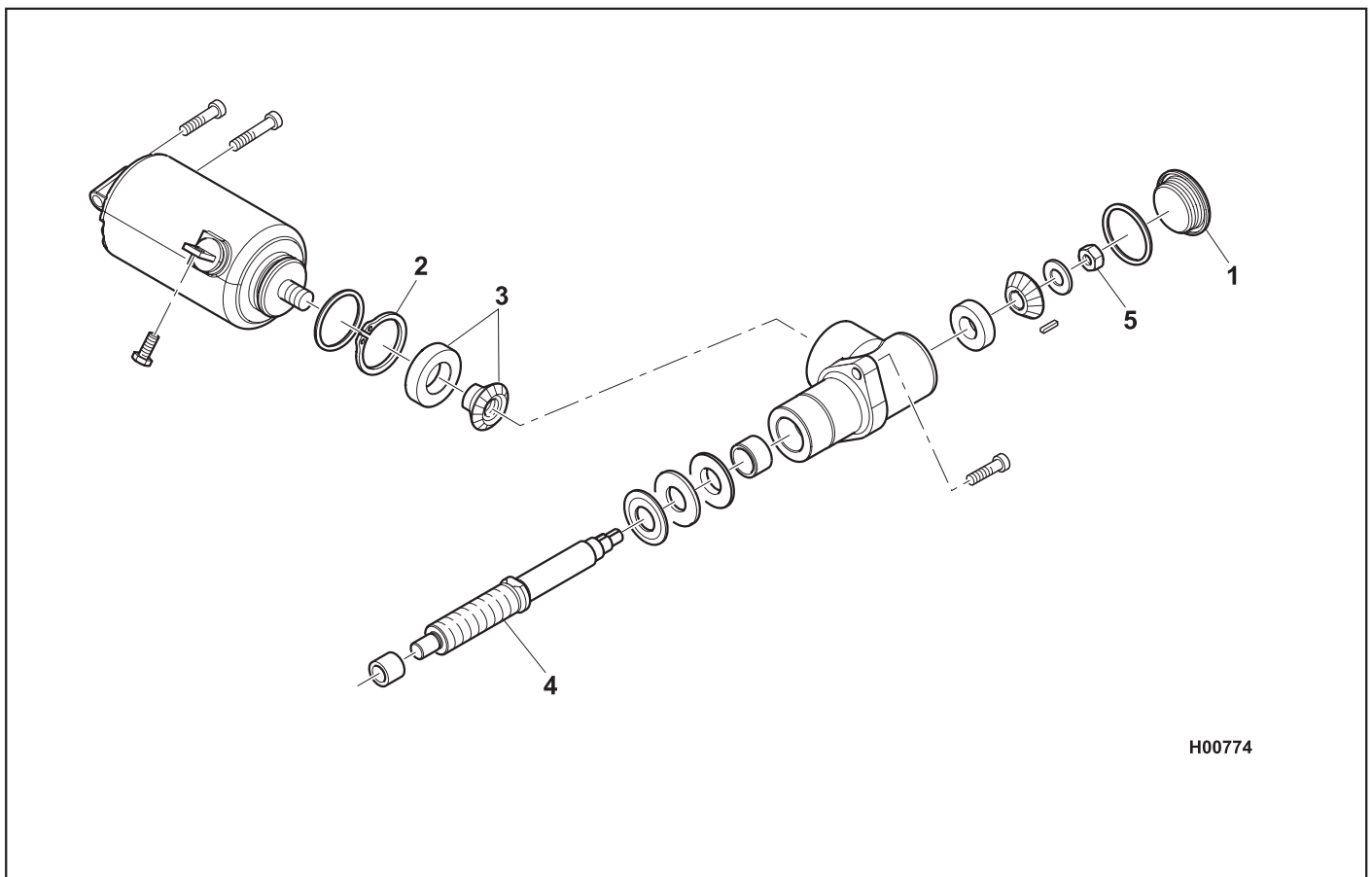


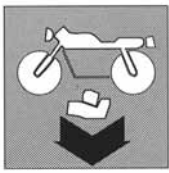
Starter motor disassembly (TE – TXC)

- Separate the starter motor (1) from the starter drive (2).



Starter drive disassembly (TE – TXC)

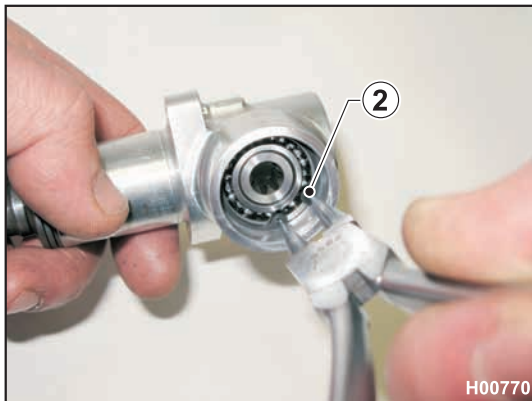




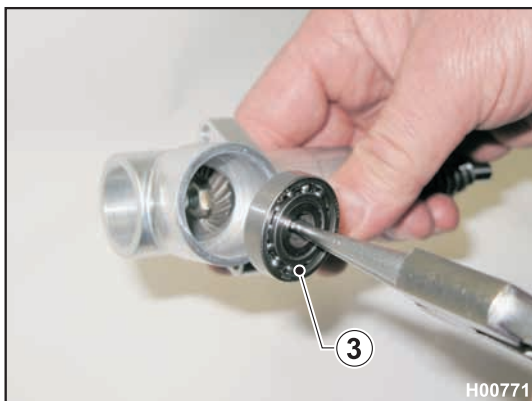
ENGINE DISASSEMBLY



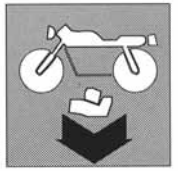
- Remove flywheel and starter motor as outlined in the relevant paragraph.
- Disassemble the starter motor as outlined in the relevant paragraph.
- Remove the cap (1) using a 10 mm Allen wrench.



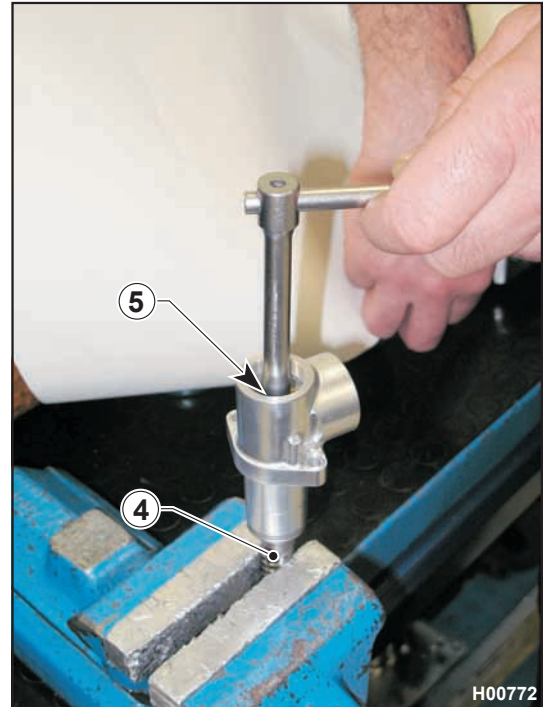
- Remove the circlip (2) and the bearing (3) with the bevel gear.



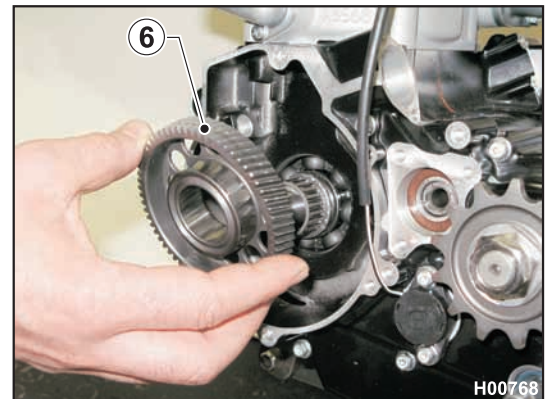
ENGINE DISASSEMBLY



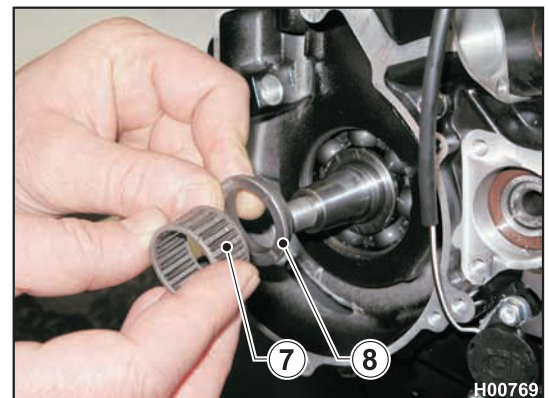
- Place the wormshaft (4) assembly in a vice with aluminium jaws, loosen the nut (5) using a 10 mm T-wrench and slide out the wormshaft (4).

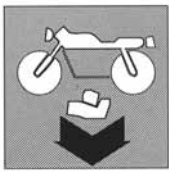


- Remove the freewheel (6).

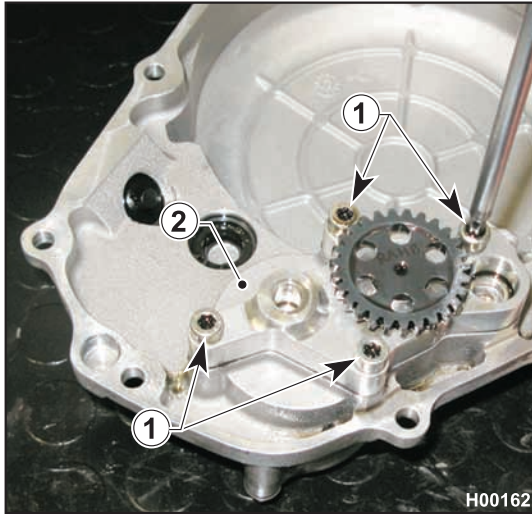


- Remove the needle roller bearing (7) and the thrust ring (8).



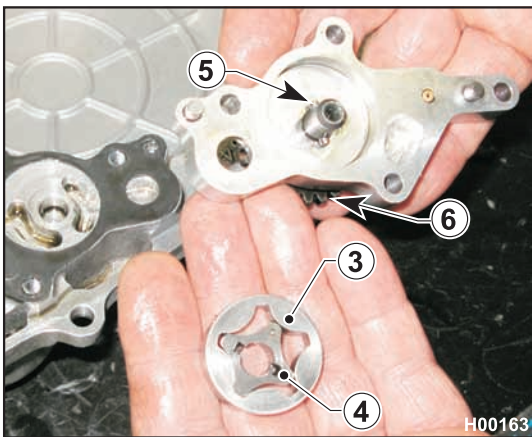


ENGINE DISASSEMBLY

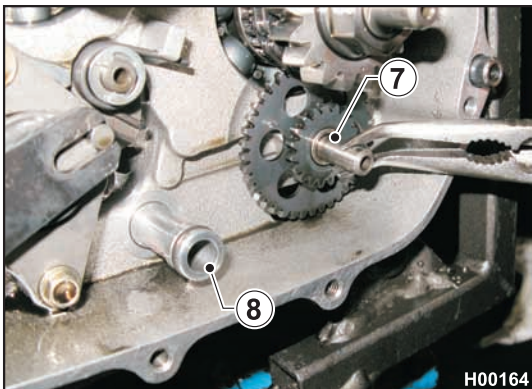


Oil pump disassembly

- Loosen the screws (1) using a 4 mm Allen wrench and remove pump body (2) and gasket.



- Remove the pump rotors (3) and (4) and extract the drive pin (5) to release the gear (6).



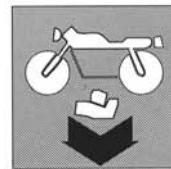
- Remove drive gear (7) and oil suction stub (8).



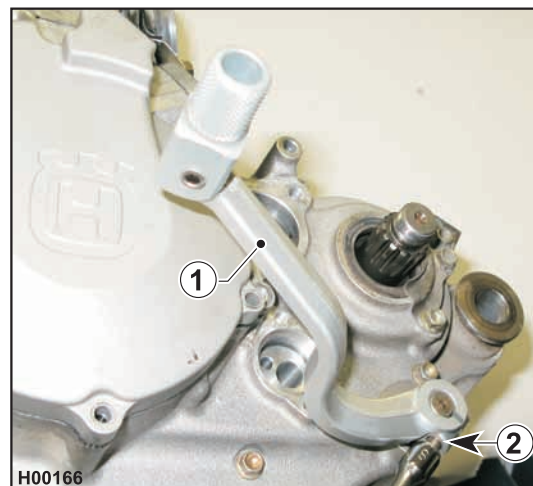
**Make sure to align the rotor dots (9) on assembly.
Gear shift pedal and selector assembly removal**



ENGINE DISASSEMBLY



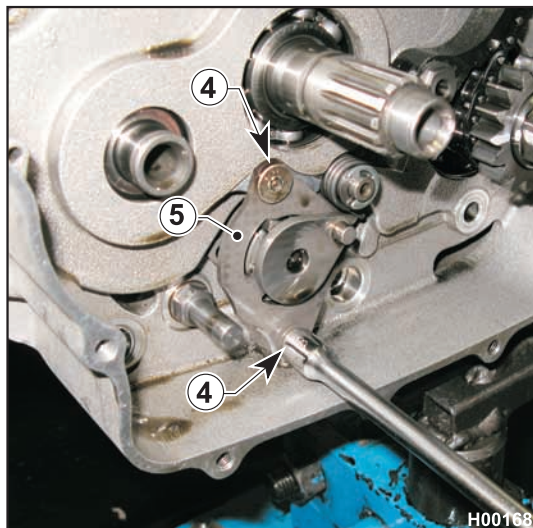
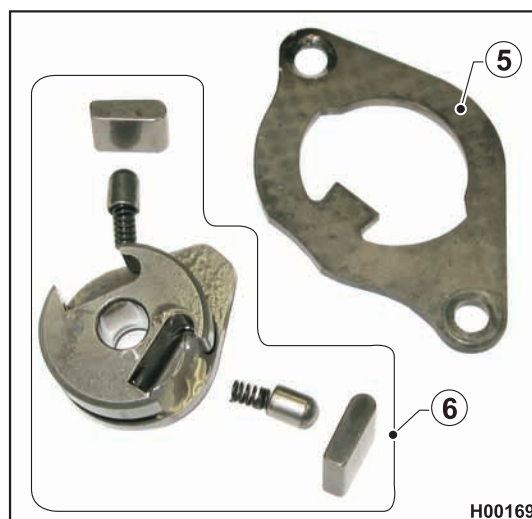
- To facilitate assembly, mark the position of the gear shift pedal (1) on the shaft. Remove the retaining screw (2) of the gear shift pedal (1) (8 mm wrench) and slide the pedal from the selector shaft.

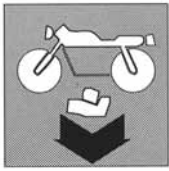


- Remove the selector shaft (3) from the right-hand side.

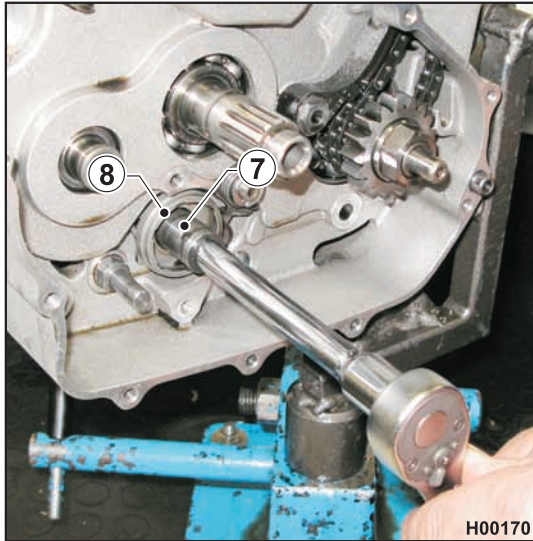


- Remove the two screws (4) (4 mm Allen wrench and 8 mm wrench) securing the selector retaining plate (5) and remove retaining plate and ratchet mechanism (6).

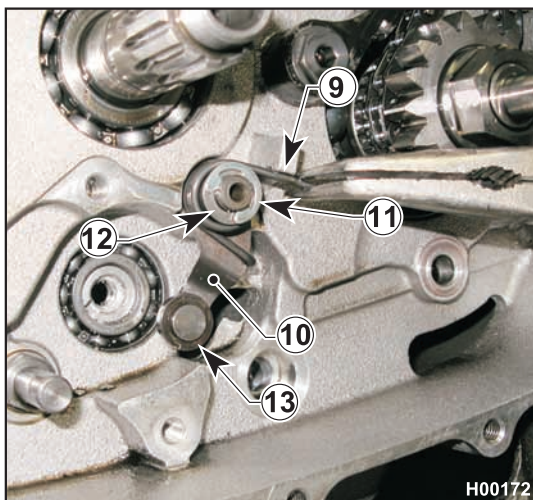
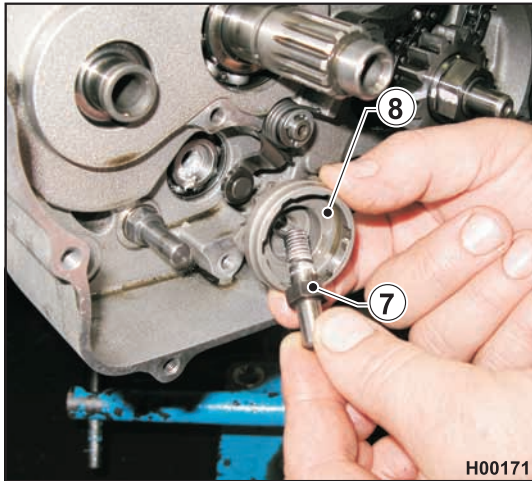




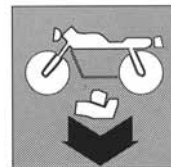
ENGINE DISASSEMBLY



- Remove the bolt (7) of the selector drum (8) (12 mm wrench).

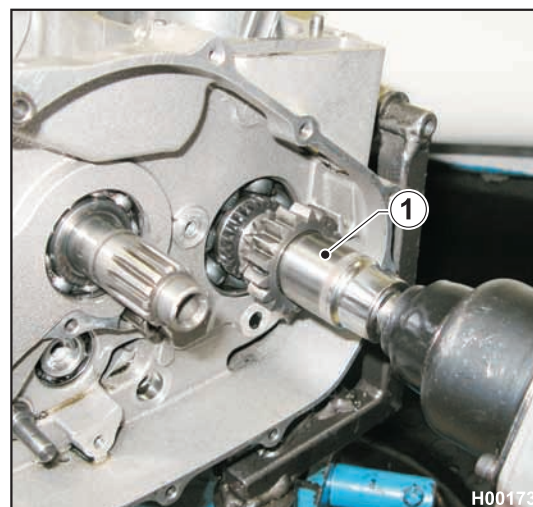


- Release the ratchet (10) spring (9) and remove retaining ring (11), washer (12) and ratchet (10).
Be careful not to lose the roller (13).

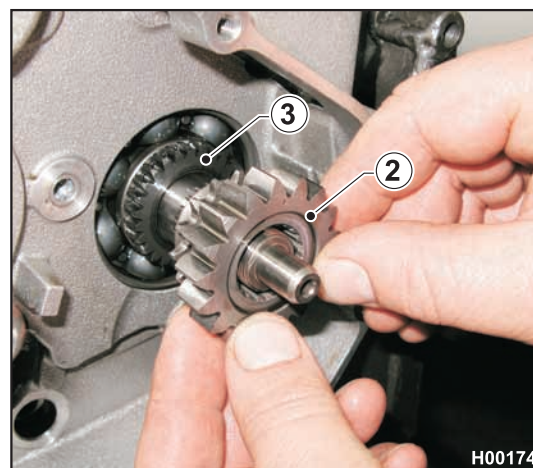


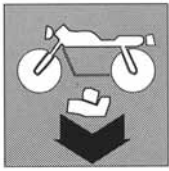
Primary drive gear removal

- Loosen the central nut (1) using a 22 mm wrench.

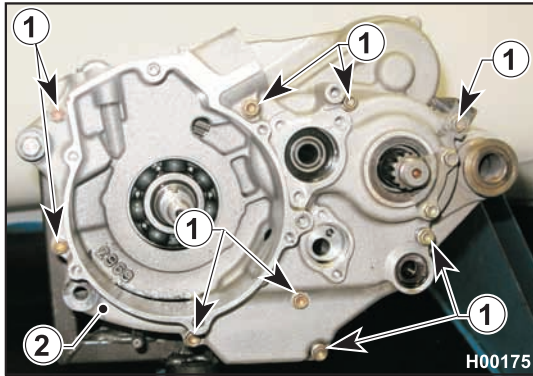


- Remove primary gear (2) and water pump drive gear (3).



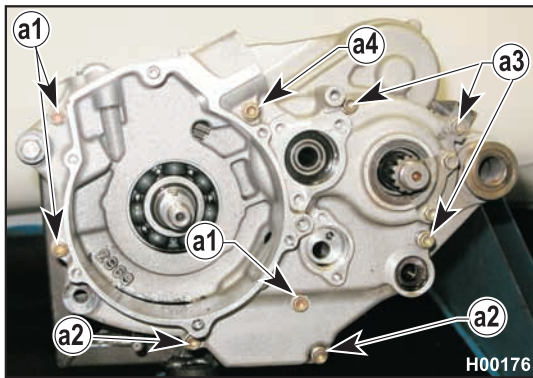


ENGINE DISASSEMBLY



Crankcase disassembly

- Remove the nine screws (1) from the left crankcase (2) (8 mm wrench).



Important: the screws (1) are not all the same length. Refer to figure "A" on assembly to ensure correct installation.

FIG. "A"

a1= 6x60 mm

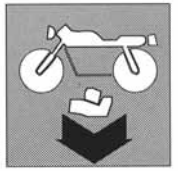
a2= 6x55 mm

a3= 6x70 mm

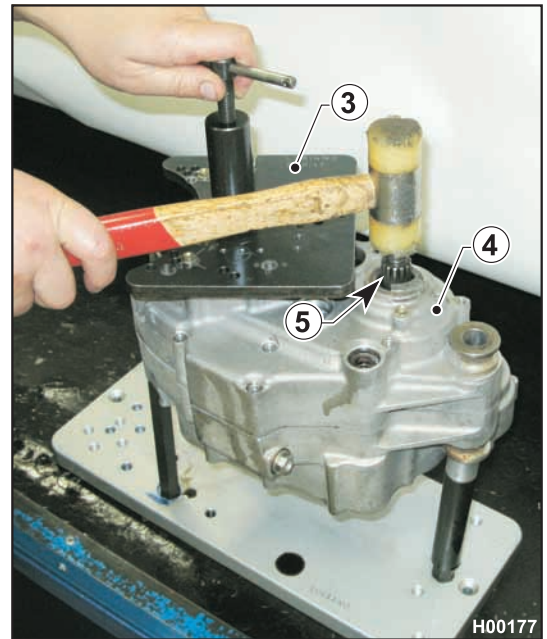
a4= 6x90 mm



ENGINE DISASSEMBLY



- Install the crankcase puller (3) (part no. 8000 A7015) using the flywheel cover holes and remove the left crankcase half (4).
- Tap the output shaft (5) with a rubber hammer at intervals during removal to keep the crankcase half from getting stuck.

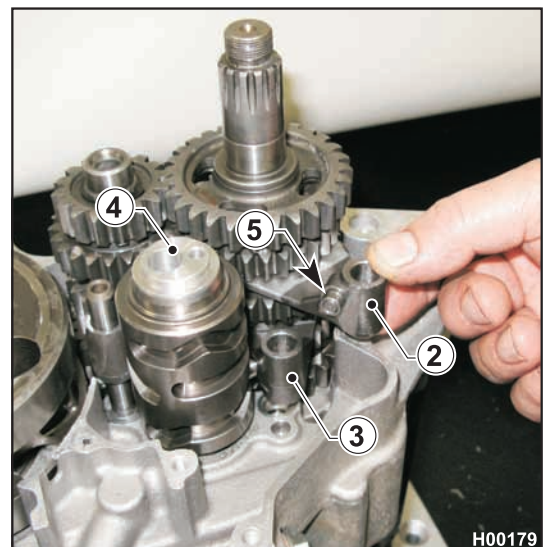


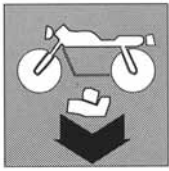
Gearbox disassembly

- Remove the shaft (1) of the output shaft shifter forks.

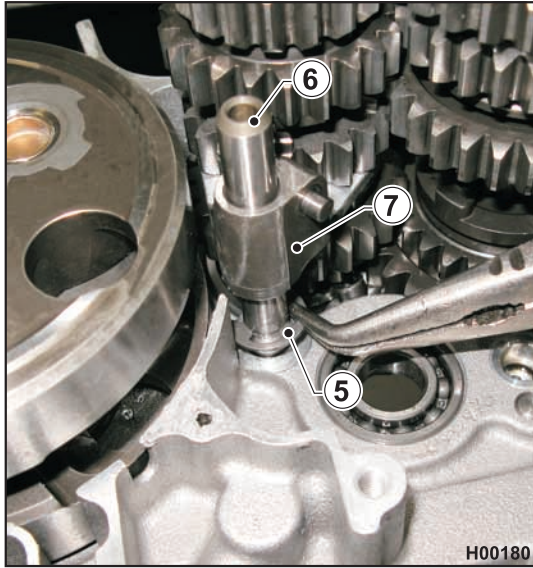


- Release the shifter forks (2) and (3) from the drum (4) and remove the forks making sure to collect the drive bushings (5). Remove the drum (4).

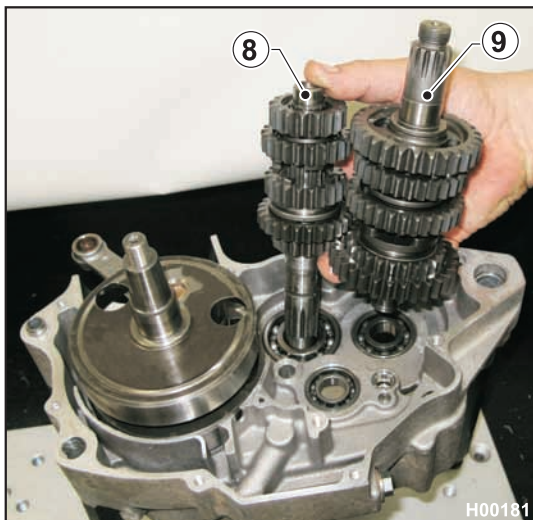




ENGINE DISASSEMBLY

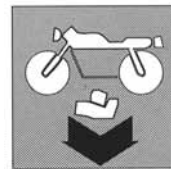


- Remove the retaining ring (5) and then the shaft (6) of the input shaft shifter fork (7).



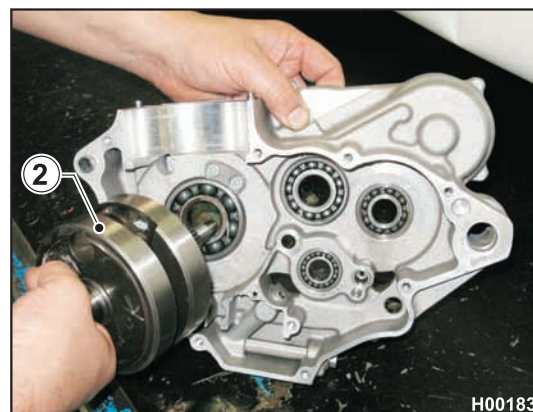
- Remove the input shaft (8) and output shaft (9) being careful not to lose any shims (if fitted).



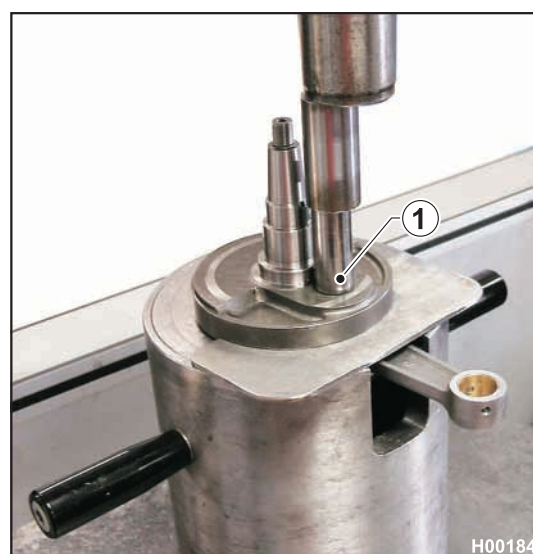


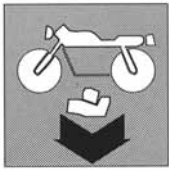
Crankshaft disassembly

- Slide the puller (1) (part no. 8000 A7015) over the right end of the crankshaft.
- Secure the puller to the crankcase half and remove the crankshaft (2) from the opposite side.



- Bring the crankshaft in the required position and remove the crank pin (3) from one of the flywheel halves (4).





ENGINE DISASSEMBLY

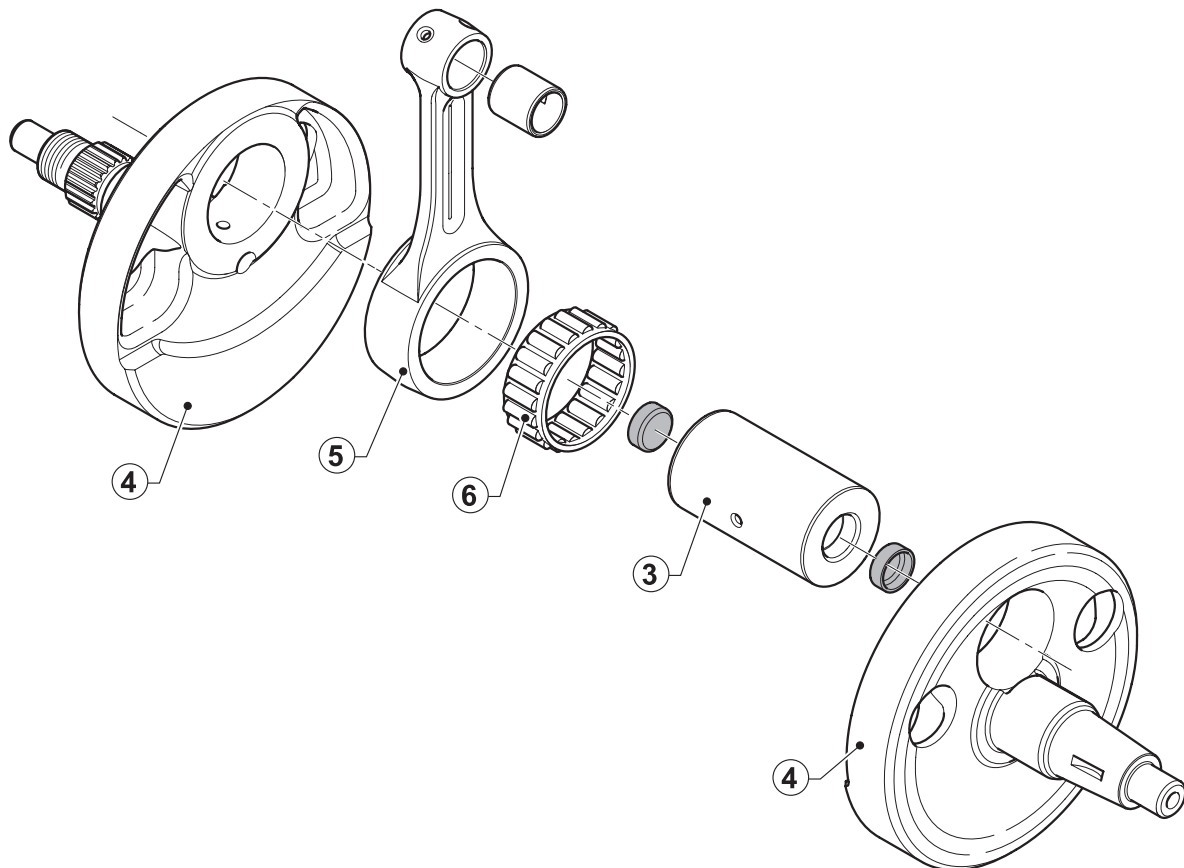


H00185



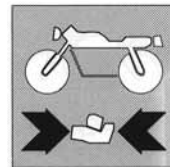
H00186

- Remove connecting rod (5) and needle roller bearing (6) from the flywheel half. Turn the flywheel half and remove the crank pin (3).



H00433

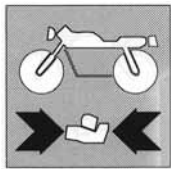
ENGINE OVERHAUL



Section

G



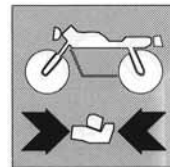


ENGINE OVERHAUL

Cleaning parts	G.3
Clearances	G.3
Cylinder head	G.3
Valve seat refacing	G.4
Valve guide	G.5
Valve guide replacement	G.5
Valve	G.7
Valve spring	G.7
Valve bucket inspection	G.8
Valve installation	G.8
Valve leak check	G.9
Camshaft	G.10
Timing chain and gears	G.10
Timing chain tensioners	G.10
Cylinder	G.11
Piston	G.11
Cylinder to piston clearance	G.12
Piston pin	G.12
Piston rings	G.13
Piston ring to cylinder clearance	G.13
Piston ring to groove clearance	G.14
Big end axial clearance	G.14
Crankshaft	G.15
Crankshaft straightness	G.15
Crankshaft	G.15
Clutch	G.16
Friction plate to clutch housing clearance	G.17
Clutch spring	G.17
Oil pump	G.19
Shifter forks and gears	G.20
Selector drum	G.20
Drive bushing roundness	G.20
Carburettor overhaul (TC)	G.21
"Keihin" carburettor setting (TC)	G.21
"Keihin" carburettor adjustment (TC)	G.22
Carburettor inspection (TC)	G.23
Needle assembly (TC)	G.24
Throttle valve (TC)	G.24
Taper needle (TC)	G.24
Floater height (TC)	G.25
Floater (TC)	G.25
Accelerator pump (TC)	G.25
Draining the fuel (TC)	G.26



ENGINE OVERHAUL



Cleaning parts

All parts must be cleaned with gasoline and dried with compressed air.



Flammable vapours develop during this procedure and metal filings blown by compressed air may get into your eyes. Perform this procedure away from open flames or sources of ignition and wear an eye protection.

Clearances

To ensure the best operating conditions and maximum performance, all clearances must be within the specified tolerance. A tight fit will lead to seizure as moving parts heat up, whereas a loose fit will cause annoying vibration resulting in early wear of moving parts.

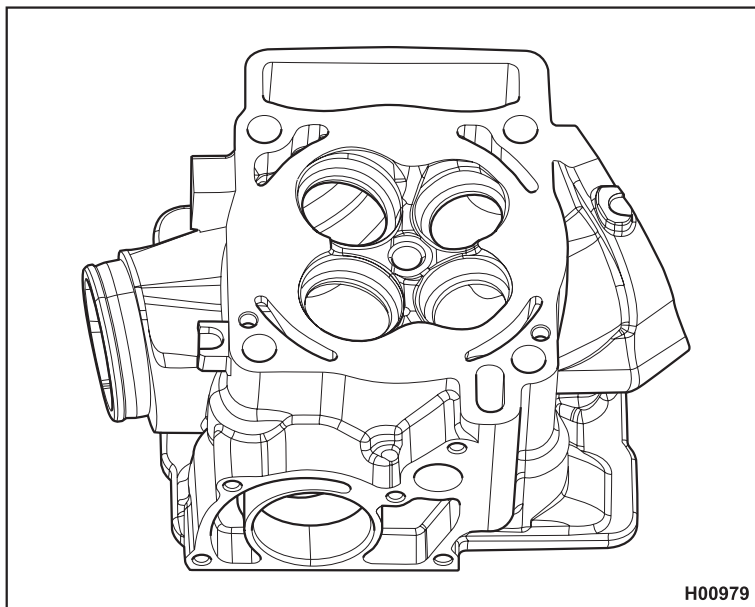
Cylinder head

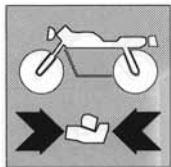
Remove fouling deposits from the combustion chamber using a rounded scraper.



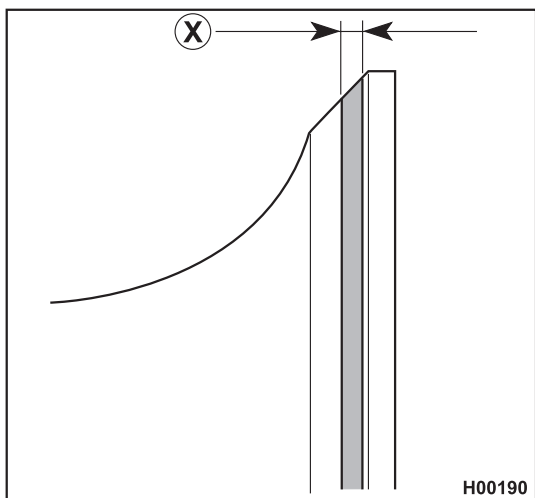
Do not use sharp tools or you might damage valve seats and spark plug thread.

Check the machined surface of the cylinder head for warpage using a straight-edge and a feeler gauge at the positions shown in the figure. If warpage exceeds the service limit at any one point, grind the cylinder mating surface. Head warpage: service limit 0.05 mm (0.0019 in.).





ENGINE OVERHAUL



Valve seat refacing

Clean off any fouling deposits from the valve. Apply Prussian Blue to the valve and rotate it in its seat using a rubber hose or other similar tool. Remove the valve and measure the width "X" of the seating face. If width is greater than 1.2 mm (0.0472 in.), the seat needs to be refaced.

The standard width (measured as shown) of the seating face of the valve is:

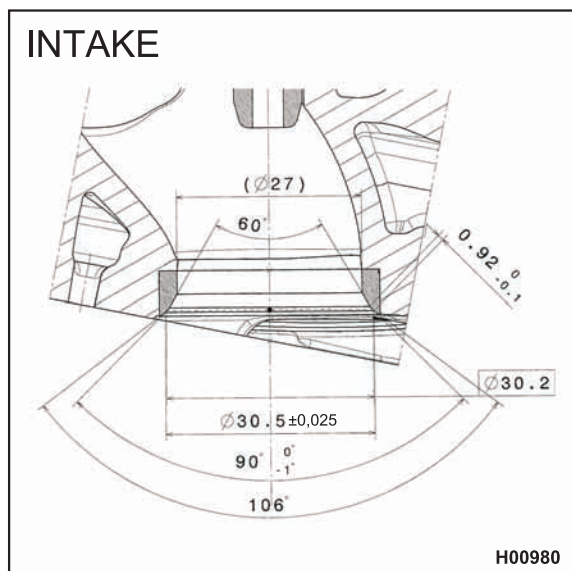
x = 0.6-0.7 mm (0.0236 - 0.0275 in.) for INTAKE valves

x = 0.7-0.8 mm (0.0275 - 0.0314 in.) for EXHAUST valves

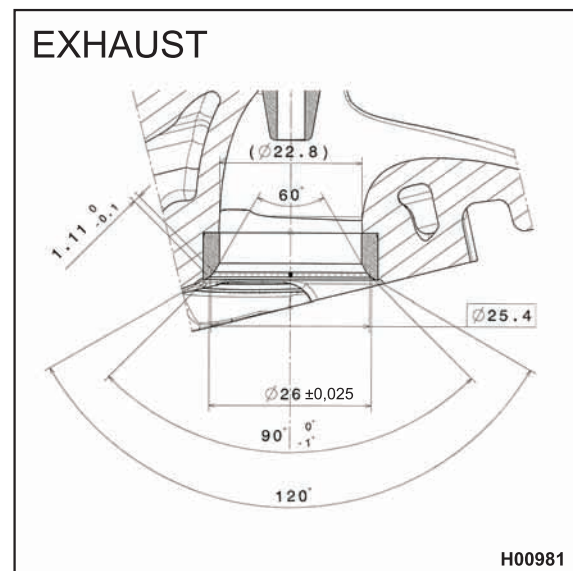


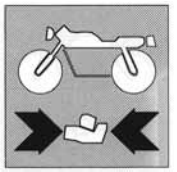
Valves cannot be ground and must be replaced if damaged.
Valve guide

INTAKE



EXHAUST





Perform a careful visual inspection of the valve guide.

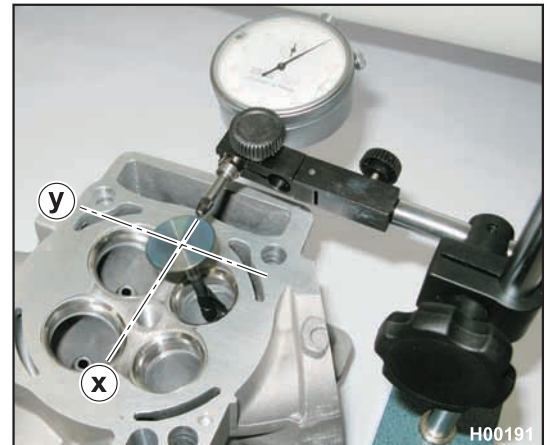
To determine wear, measure valve to valve guide clearance in the "x" and "y" directions (at right angles to each other) using a suitably positioned dial gauge.

Intake valve: normal clearance: 0.008 - 0.035 mm

Service limit: 0.05 mm (0.0019 in.).

Exhaust valve: normal clearance: 0.018 - 0.045 mm

Service limit: 0.08 mm (0.0031 in.).



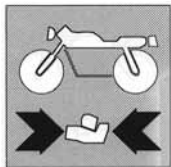
Valve guide replacement

Make sure that the cylinder head is not damaged.

Heat up the head in a furnace at 170 °C for 30 minutes.

Remove the valve guide from the cylinder head using a suitable punch.

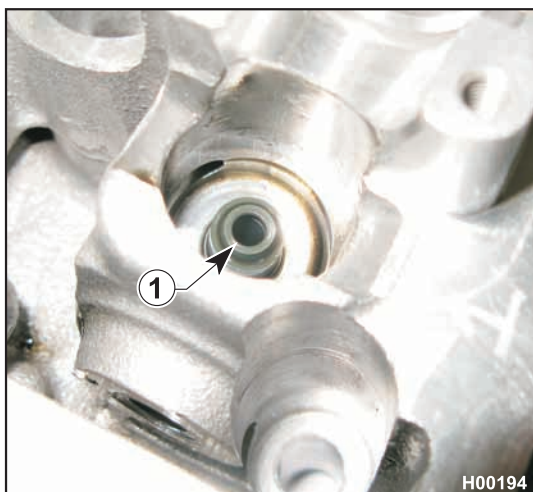




ENGINE OVERHAUL



Install the new guide from the top of the head using a suitable punch. Smear the guide with oil before installation.



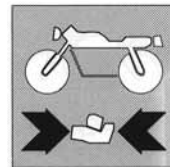
Ream the valve guide using a suitable reamer and lubricate with cutting fluid. Rotate the reamer when extracting it to avoid scoring the valve guide.



When a valve guide is changed, the valve seat must be refaced.

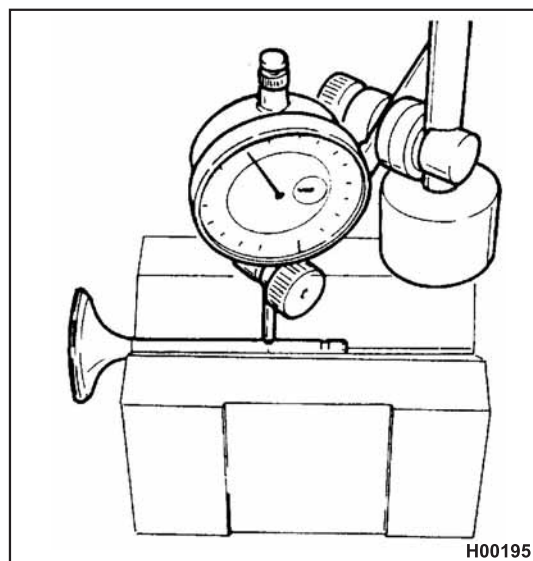
Check clearance again as outlined above.
Refit the sealing rings (1).

Valve

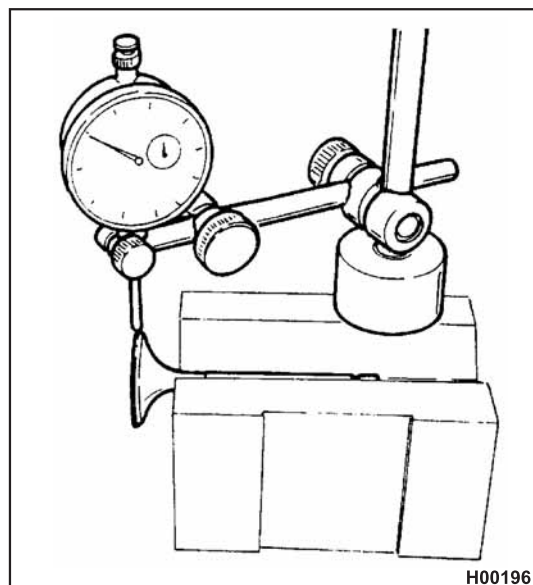


Inspect valve stem and valve seating face to make sure they are in good condition. There should be no signs of pitting, cracking, distortion or wear. Check for the following:

- Valve stem runout: place valve on a V block and measure runout with a dial gauge. (Service limit: 0.05 mm).



- Valve head out-of-round: place valve on a V block and check with a dial gauge at right angles to the head while turning the valve. (Service limit: 0.03 mm).



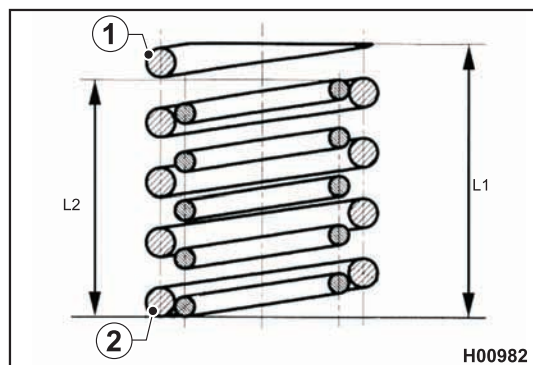
Valve spring

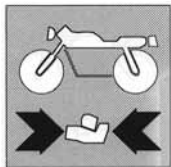
Check free length "L". Replace springs if they exceed the service limit.

Intake:	Spring 1 - L1 = 25.4 mm - Service limit 23.9 mm
	Spring 2 - L2 = 21.4 mm - Service limit 19.9 mm
Exhaust:	Spring 1 - L2 = 22.6 mm - Service limit 21.1 mm
	Spring 2 - L2 = 19.6 mm - Service limit 15.1 mm

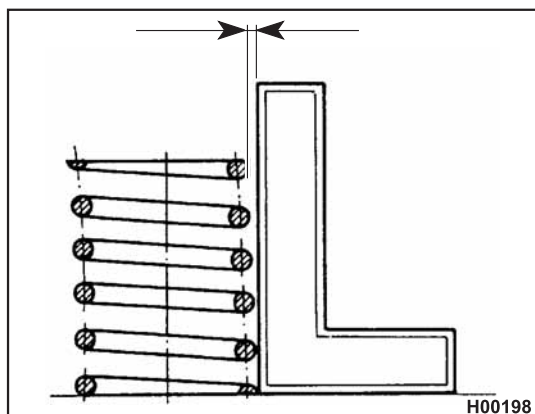


Replace all valve springs whenever any one spring exceeds the service limit.

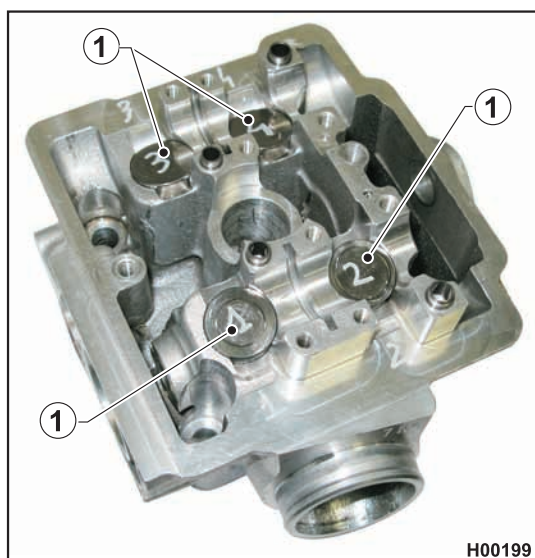




ENGINE OVERHAUL



Check the valve springs for proper squareness.
Maximum acceptable deviation is 1.5 mm on each side.

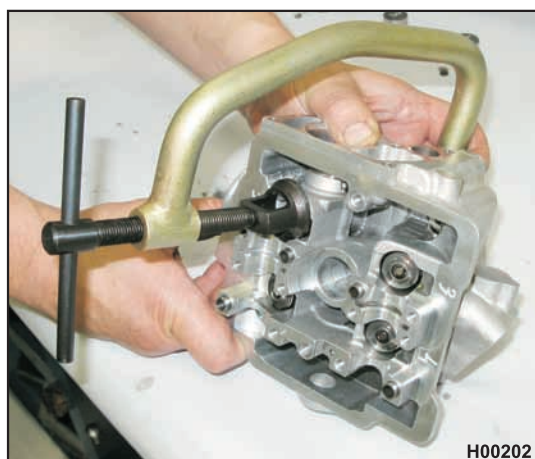


Valve bucket inspection

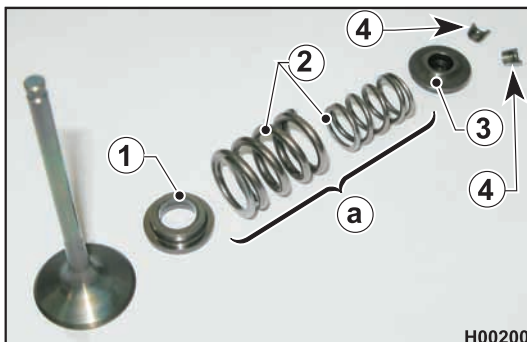
Check that the valve buckets (1) slides freely in their seats.
If not so, replace them.

Valve installation

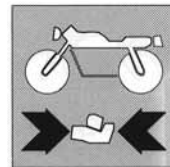
Smear valve guides and stems with oil before installation.
Install spring seat (1) and springs (2) - place spring (a) at head end - and finally the spring retainer (3).
Use tool no. 8000 A7317 to compress the valve springs and install the valve collets (4).



Do not compress the springs too much and avoid damage to the cylinder head.



ENGINE OVERHAUL



Tap valve stem lightly with a plastic hammer and an aluminium punch to help the valve collets become seated.



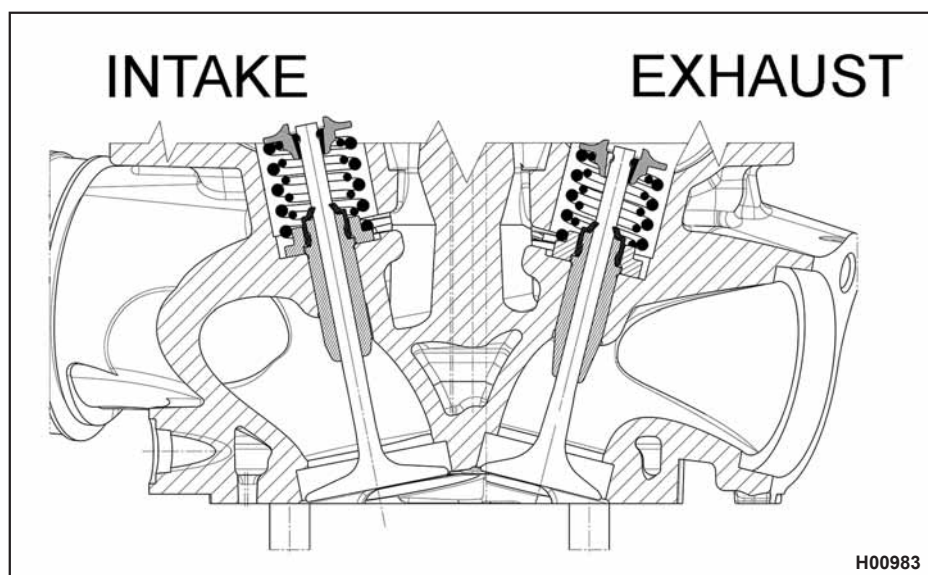
Tap the valve stem tip to avoid pushing the valve off centre.



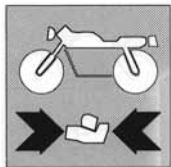
H00201

Valve leak check

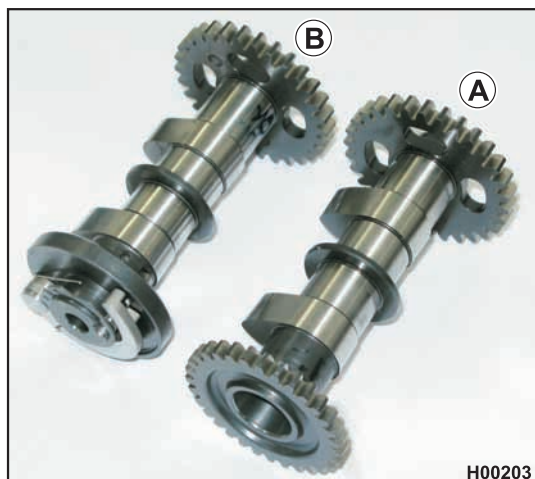
Check the valves for proper sealing before assembling the cylinder head to the engine.



H00983

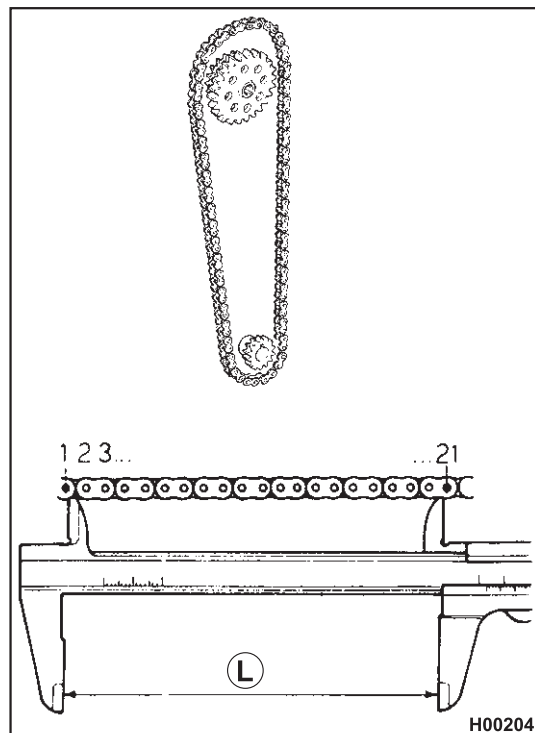


ENGINE OVERHAUL



Camshaft

Check the contact faces of the lobes for streaks, scoring, dents and waviness. Clamp the camshaft between centres and check deviation using two dial gauges. Service limit: 0.1 mm. Check that the lobes are in pristine conditions, without signs of scoring or distortion.

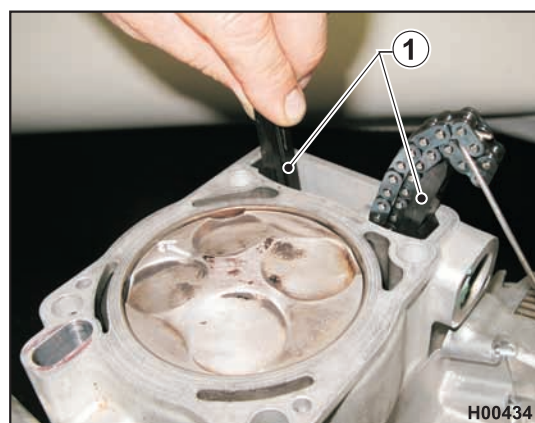


Timing chain and gears

At each engine overhaul, check gear teeth and chain rollers for wear. If gear teeth are badly worn, change both gears and the chain. Hold the chain taut to take out any slack and measure across 20 links (21 pins).

If any one gear or the chain is worn beyond the specified limit, replace both gears and the chain as a set.

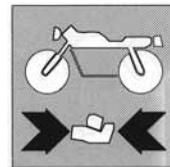
STANDARD "L"	SERVICE LIMIT
140 mm (5.51 in)	142.5 mm (5.61 in)



Timing chain tensioners

Chain tensioners (1) must be replaced when the wear material is worn out.





Cylinder

Check the walls for dents or scuffing. Measure cylinder bore diameter at three different positions. Measure each diameter in two directions at right angles to each other to determine taper and out-of-round.

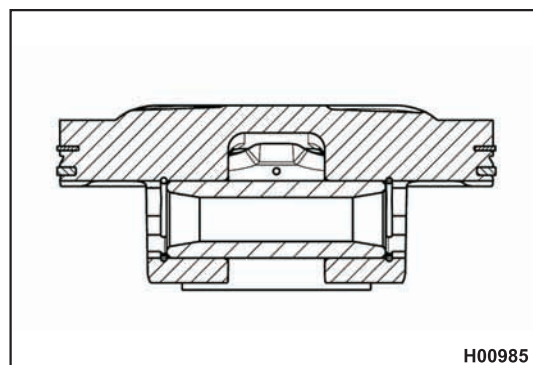
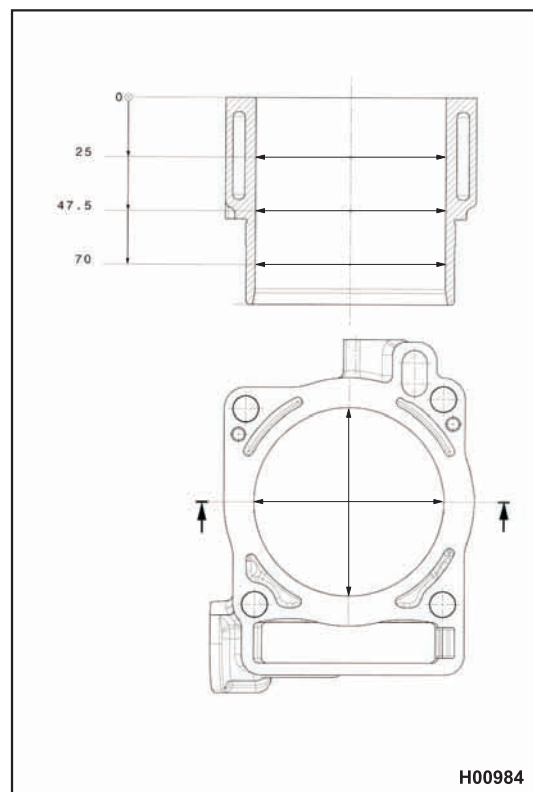
Max. taper (wear limit): 0.05 mm.

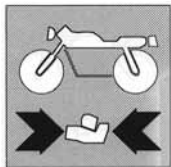
Max. out-of-round (wear limit): 0.05 mm.

If cylinder is worn beyond these limits, replace both cylinder and piston. The liner undergoes a special hardening treatment and cannot be ground.

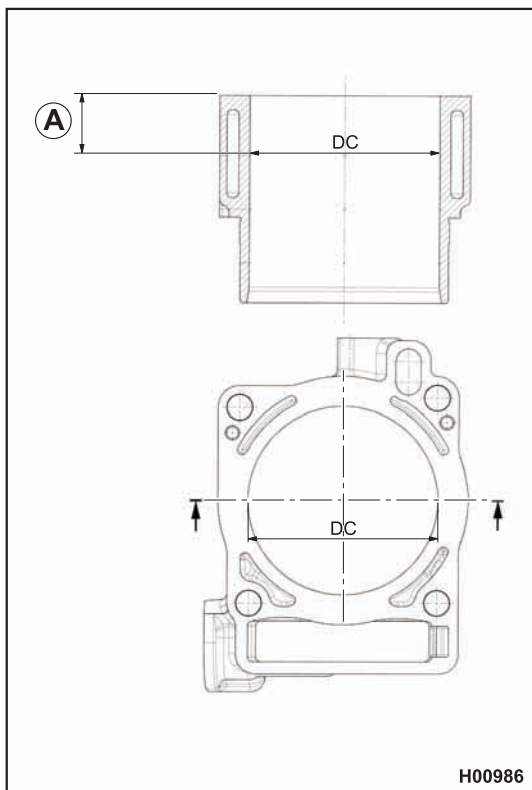
Piston

Clean off any carbon deposits from piston crown and grooves. Perform a careful visual inspection of the piston and check its dimensions. There should be no signs of forcing, scuffing, cracking or other damage.





ENGINE OVERHAUL



Cylinder to piston clearance

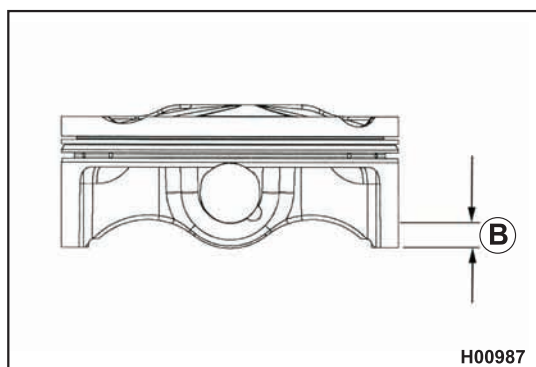
Cylinder diameter

Measure inside diameter (Dc) with an internal bore micrometer 25 mm (0.9842 in.) below the edge (distance "A").

Piston diameter

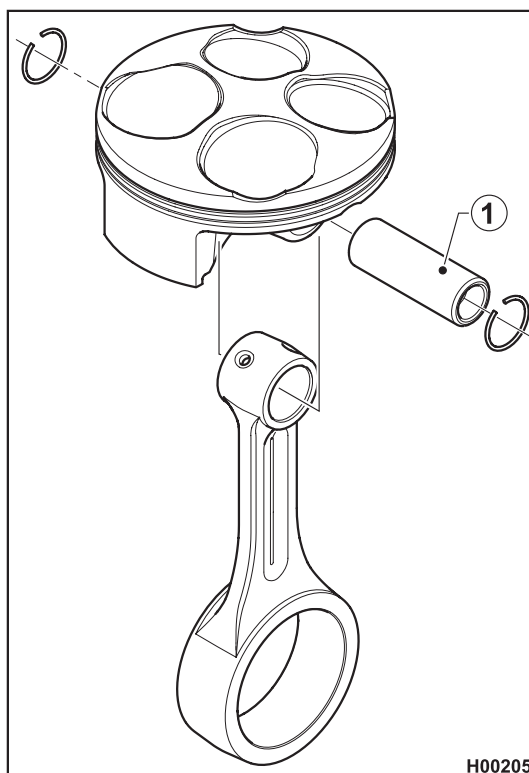
Measure piston diameter (Dp) 7 mm (0.2755 in.) above skirt edge (distance "B").
Clearance is calculated as follows = Dc-Dp.

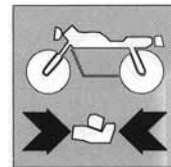
CLEARANCE (Dc-Dp)	SERVICE LIMIT
0.035-0.065 mm (0.001379-0.002561 in.)	0.10 mm (0.004 in.)



Piston pin

The piston pin (1) must be perfectly smooth, with no signs of scoring, dents or bluing due to overheating.



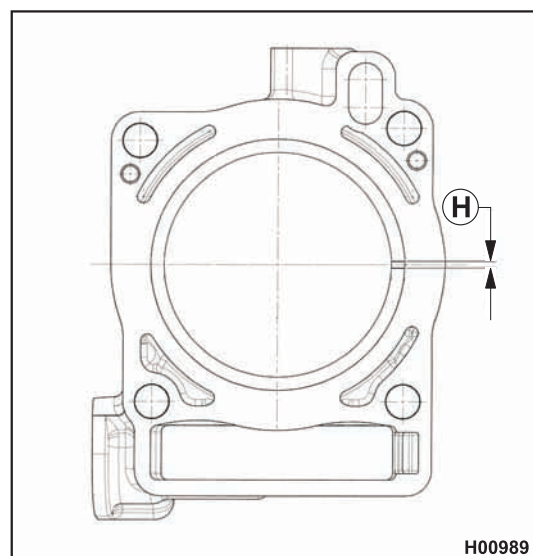


Piston rings

They should show no signs of forcing or scoring.
Replacement pistons come with piston rings and piston pin.

Piston ring to cylinder clearance

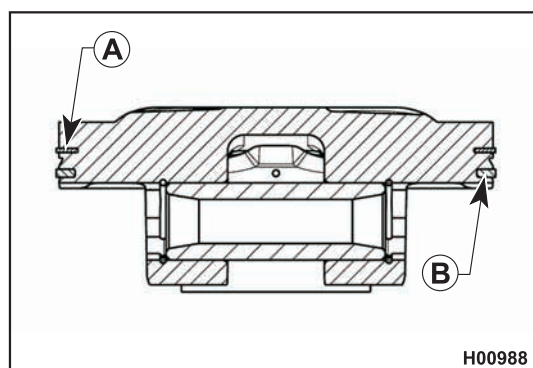
Insert the piston ring at the bottom of the bore (where minimum wear occurs) taking care to position it squarely and measure end gap.



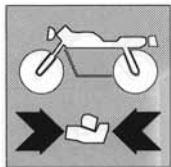
H00989

Piston ring to cylinder clearance

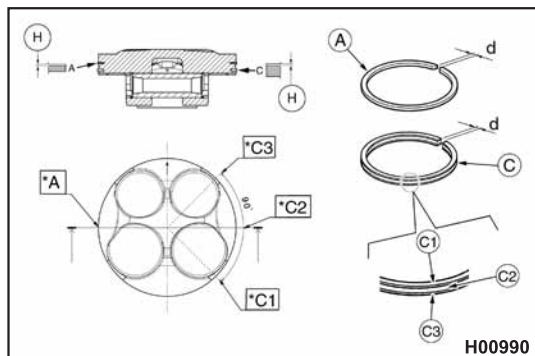
PISTON RING	MOUNTING CLEARANCE (H)	SERVICE LIMIT
"A"	0.15 -0.30 mm (0.00591-0.01182 in.)	0.45 mm (0.01773 in.)
"B"	0.2-0.7 mm (0.00788-0.02758 in.)	0.85 mm (0.03349 in.)



H00988



ENGINE OVERHAUL



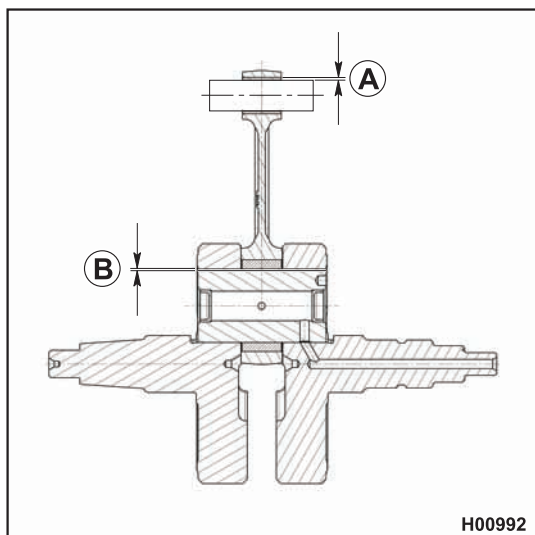
PISTON RING END GAP ALIGNMENT

*: end gap position "d"

Piston ring to groove clearance

Use a feeler gauge to measure the axial clearance (H) of piston rings. If the piston ring is marked on one side, that side must be facing up.

PISTON RING	MOUNTING CLEARANCE (H)	SERVICE LIMIT
"A"	0.02-0.06 mm (0.00078-0.02362 in.)	0.09 mm (0.00354 in.)
"B"	0.01-0.18 mm (0.00039-0.00708 in.)	0.25 mm (0.03349 in.)



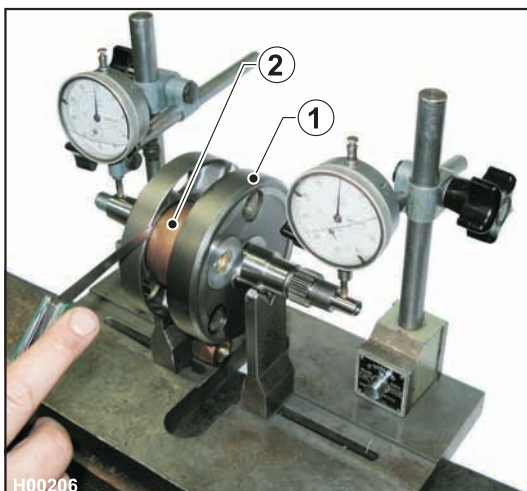
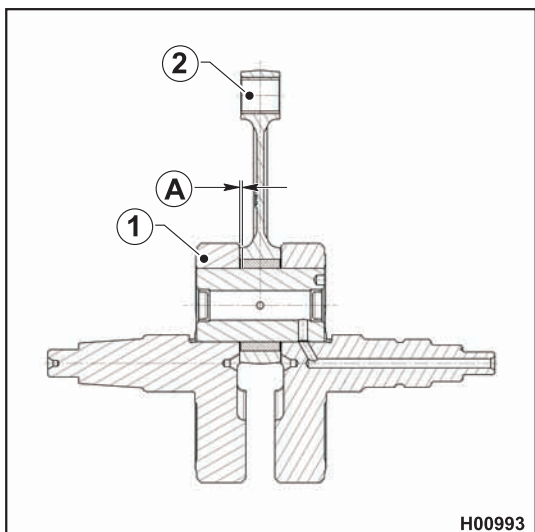
Piston pin to small end clearance (A): 0.019 - 0.01 mm.
SERVICE LIMIT: 0.050 mm

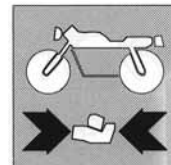
Big end side clearance (B): 0.018 - 0.030 mm.
SERVICE LIMIT: 0.070 mm

Big end axial clearance

Measure axial clearance "A" between crankshaft (1) and connecting rod (2) using a feeler gauge. Compare measured clearance with the table below.

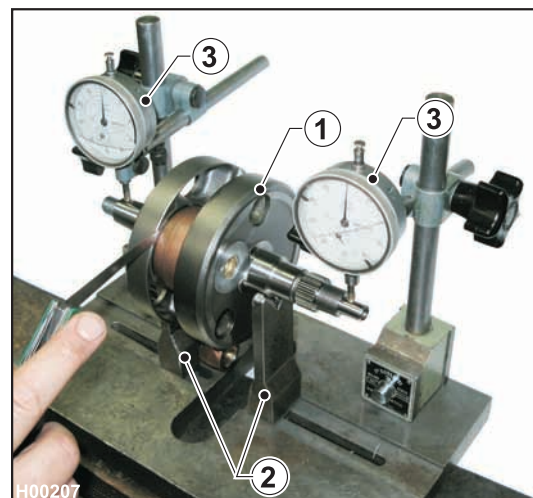
STANDARD
0.29-0.43 mm (0.00985-0.016942 in.)





Crankshaft

Main journals should show no scoring or scuffing. Threads, keyways and splines must be in good condition.



Crankshaft straightness

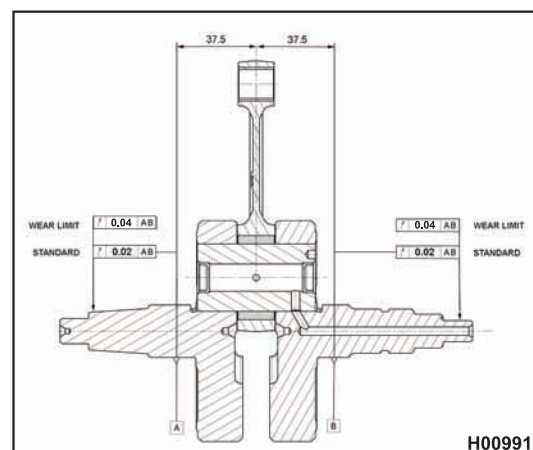
Place the crankshaft (1) on a stand (2) with two dial gauges (3) positioned on the journals.

Turn the crankshaft and measure runout.

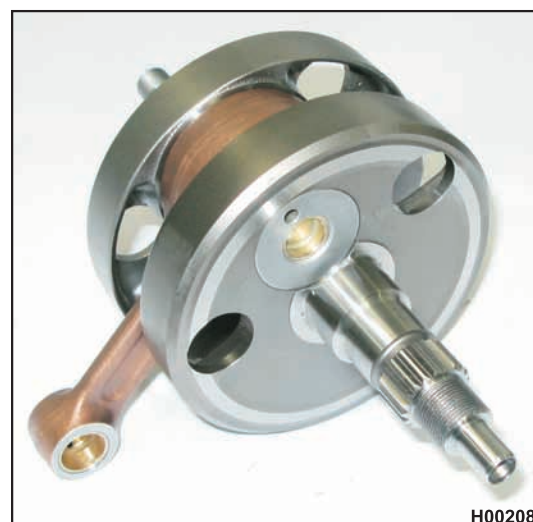
STANDARD	SERVICE LIMIT
< than 0.02 mm (0.00078 in.)	> than 0.04 mm (0.0015 in.)

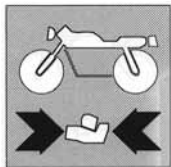


If measured runout exceeds 0.04 mm (0.0016 in.), the crankshaft must be straightened or replaced.

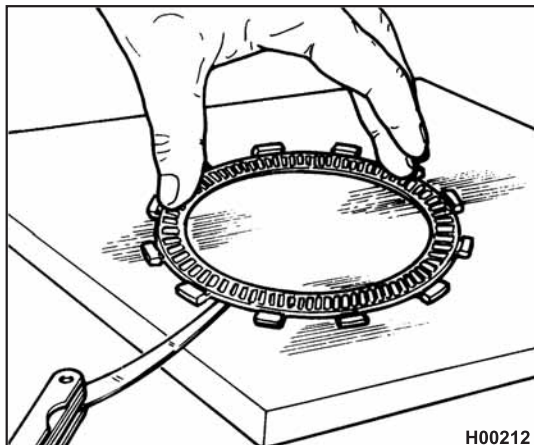


Crankshaft





ENGINE OVERHAUL



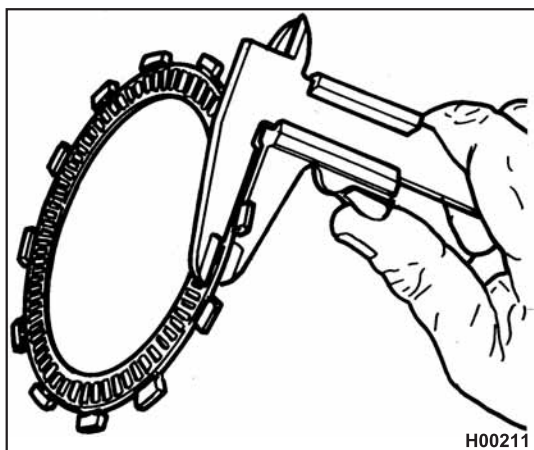
Clutch

Inspect all clutch components to make sure they are in the best conditions. Clutch plates should show no signs of bluing, scoring or distortion. Measure the thickness of friction plates.

Plate thickness when new: 3.0 mm (0.1181 in.).

Service limit: 2.9 mm (0.1141 in.).

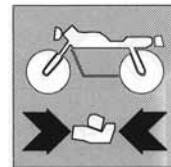
Clutch pack thickness: 29.4 mm (1.1574 in.).



Place each (friction and steel) plate on a surface plate and check for distortion using a feeler gauge; Use a feeler gauge.

Service limit: 0.2 mm.





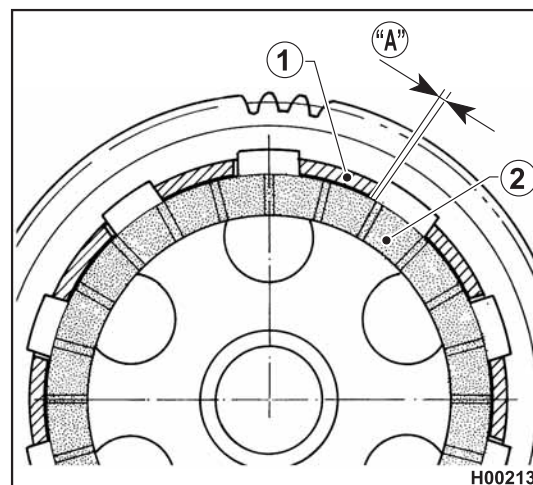
Friction plate to clutch housing clearance

Measure clearance "A" between clutch housing (2) and plate (1) with a feeler gauge and compare measured clearance with the table below.

STANDARD	SERVICE LIMIT
0.30-0.50 mm (0.012-0.020 in.)	0.6 mm (0.024 in.)



If measured clearance exceeds the service limit, replace clutch plates or housing and repeat measurement. If measurement is still outside the service limit, replace the complete clutch assembly.



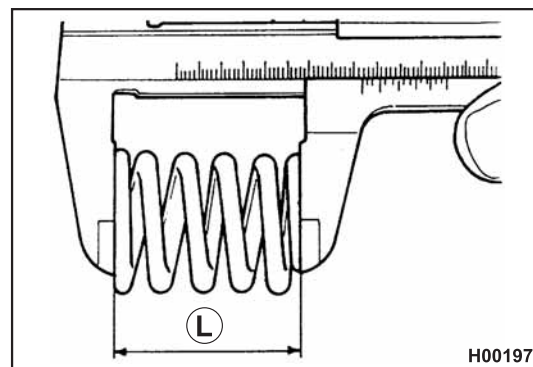
Clutch spring

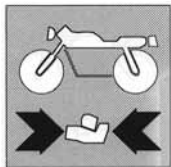
Measure the free length "L" of each spring with a calliper.

New spring L= 37.3 mm (1.4685 in.).

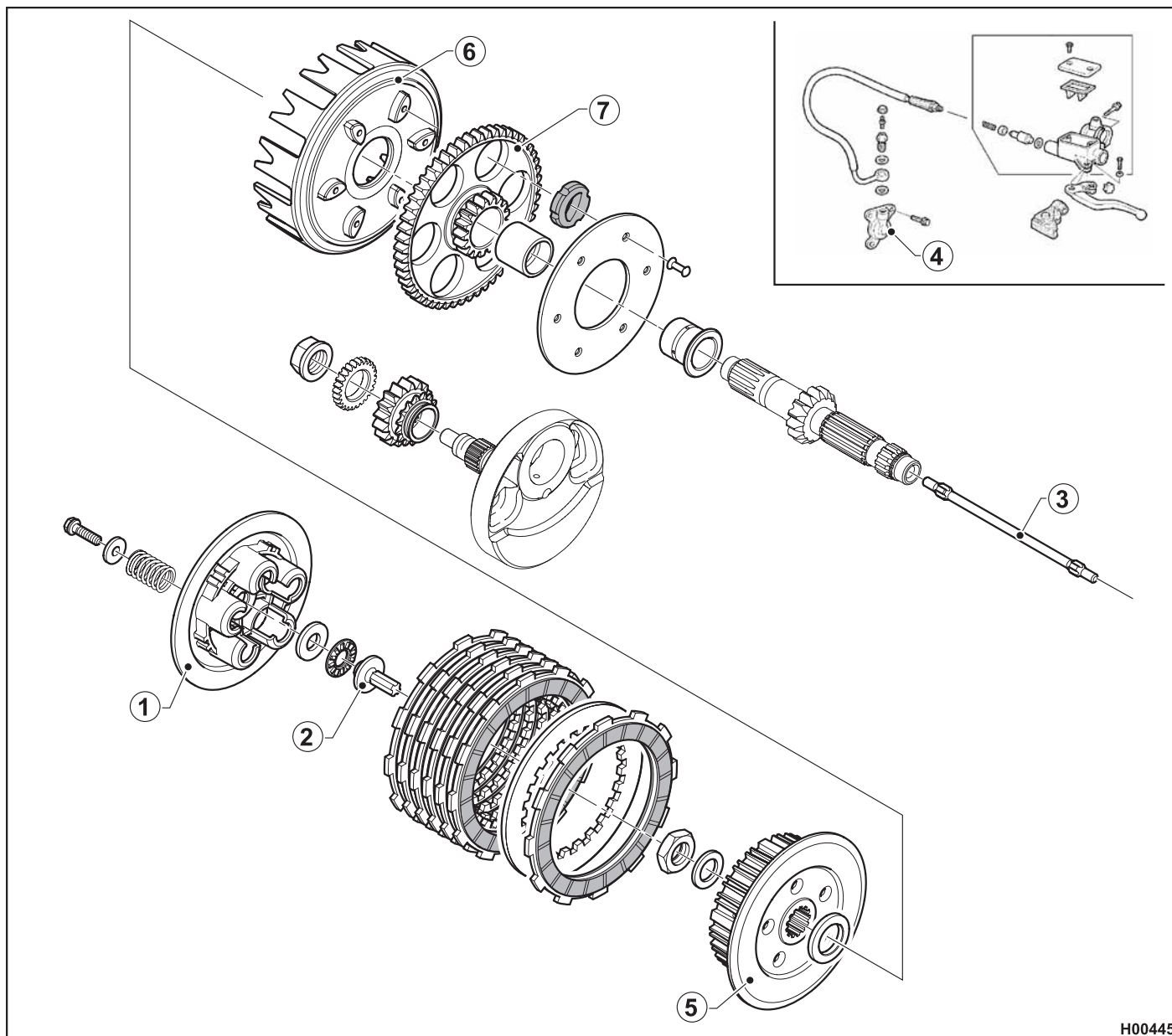
Service limit: 35 mm (1.3779 in.).

Change any spring that is outside the service limit.





ENGINE OVERHAUL



H00445

1- Pressure plate, 2- Clutch actuator plate, 3- Pushrod, 4- Piston assembly: Check these parts for signs of wear or failure. If any are found, replace the part.

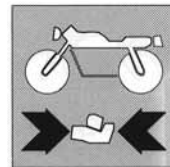
5- Clutch hub: Check the steel plate slots for signs of wear or failure. If any are found, replace the part.

6- Clutch housing: Check the friction plate slots for signs of wear or failure. Check the needle roller bearing seats for signs of wear. If any are found, replace the part.

7- Primary drive gear pair: Check gear teeth for signs of wear or failure. If any are found, replace the part.

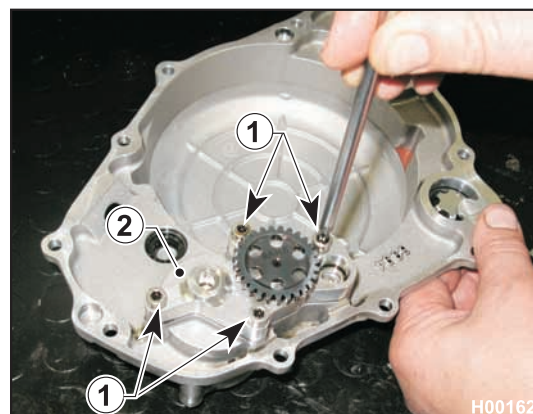


ENGINE OVERHAUL

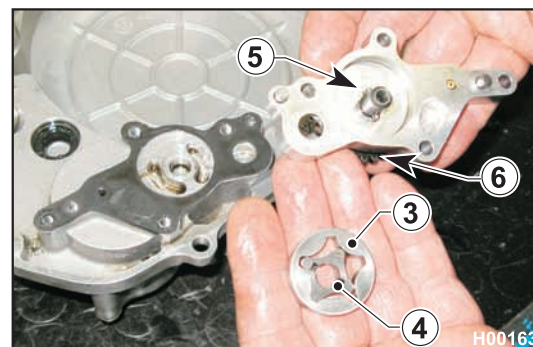


Oil pump

Loosen the screws (1) using a 4 mm Allen wrench and remove pump body (2) and gasket.

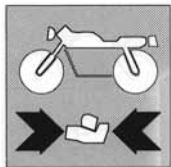


Remove the pump rotors (3) and (4), and extract the drive pin (5) to release the gear (6).
Check gear (6) and rotors (4) for wear. Replace if worn.

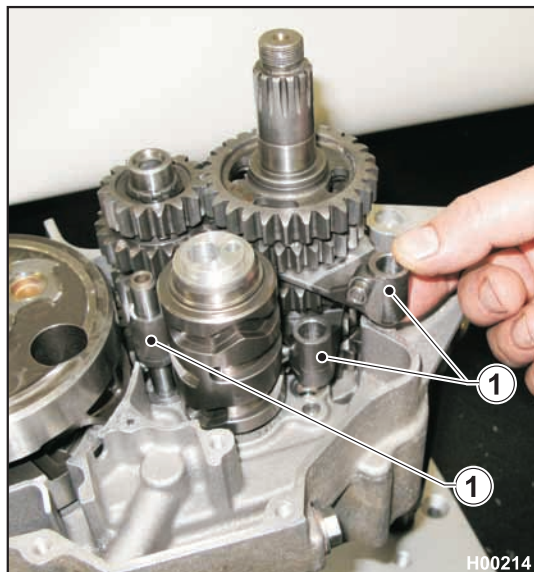


Smear the rotors with oil and make sure to align the rotor dots (9) on assembly. Use a new gasket.





ENGINE OVERHAUL

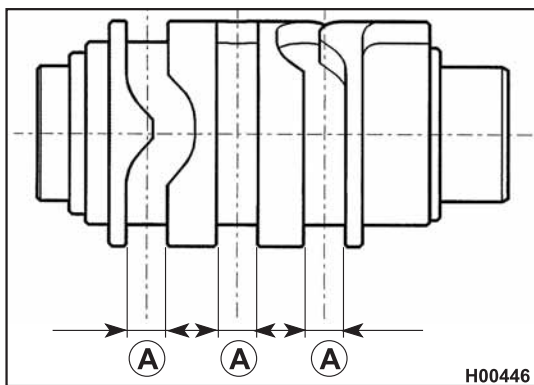
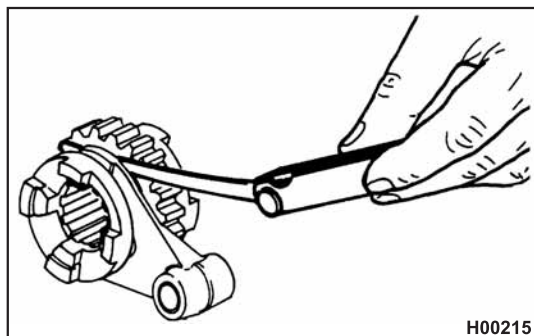


Shifter forks and gears

Visually inspect the shifter forks (1) and replace any bent forks. A bent fork will make gears hard to engage or let the transmission jump out of gear unexpectedly under loading.

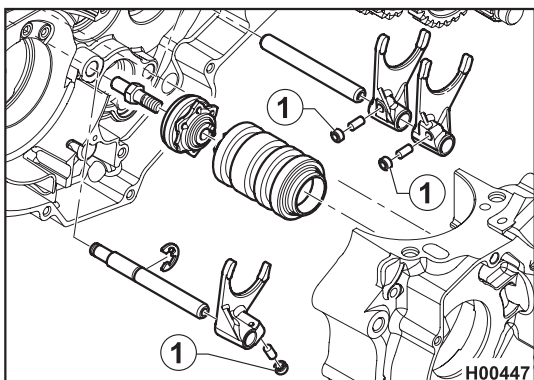
Check the clearance of the each shifter fork in its gear groove using a feeler gauge. If any one of the three gears is outside the service limit, measure the width of gear groove and fork thickness to determine which component needs to be replaced. Shifter fork to groove clearance (new fork and gear): 0.22 - 0.37 mm (0.008661 - 0.014566 in.)

Service limit: 0.5 mm (0.019685 in.).



Selector drum

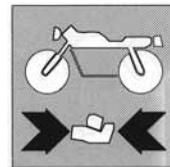
Check the grooves "A" for wear or dents and make sure the selector drum is not bent, worn or damaged.



Drive bushing roundness

Check the drive bushings (1) of the shifter forks for out-of-round and make sure they slide freely in the drum grooves and on the selector shaft.





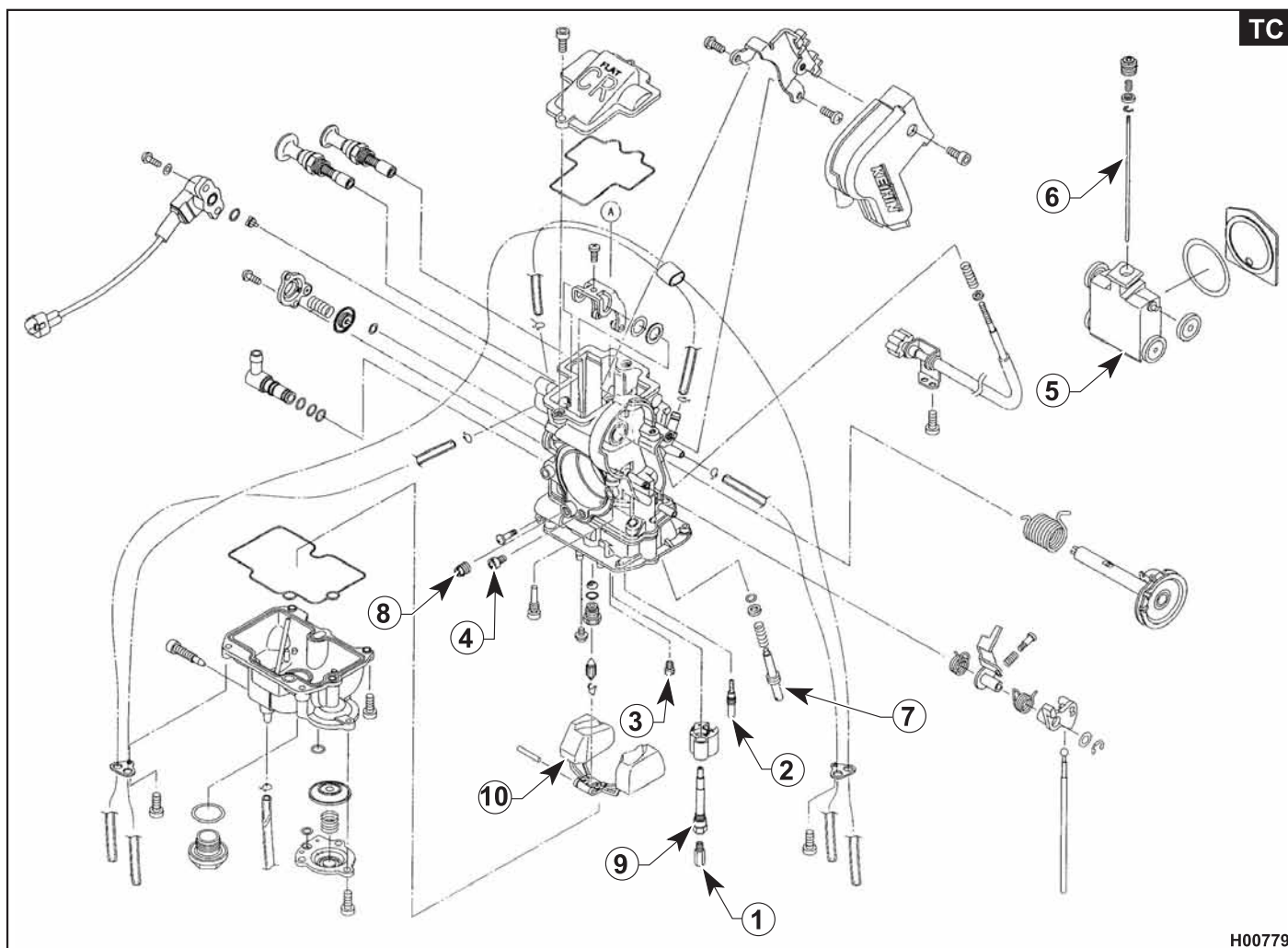
Carburettor overhaul (TC)

Clean all carburettor components thoroughly with gasoline and dry them with compressed air. Clean all jets and holes thoroughly blowing them with compressed air. Never use tool bits or metal wire.

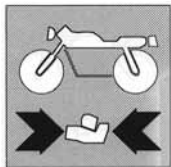
Check that the slide valve is in good condition. It should slide freely in its housing, without too much play. Check that taper needle and main nozzle are in good condition. Check the needle valve for proper sealing.

"Keihin" carburettor setting (TC)

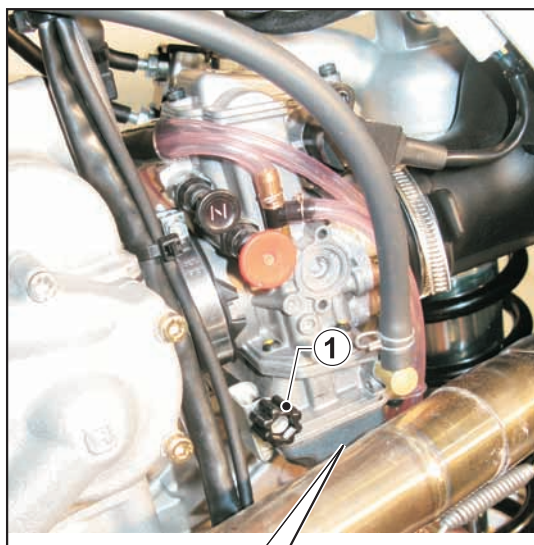
- 1 Main jet: 190;
- 2 Idle jet: 38;
- 3 Starting jet: 72
- 4 Main air jet: 200
- 5 Throttle valve: 15/M
- 6 Taper needle/groove: OBDVR/6°;
- 7 Air screw turned out: 1+1/2 turns;
- 8 Idle air jet: 100
- 9 Main nozzle: P4
- 10 Floater: g. 11.2
- Venturi diameter: 39 mm (1.5354 in.)



H00779



ENGINE OVERHAUL



"Keihin" carburettor adjustment (TC)

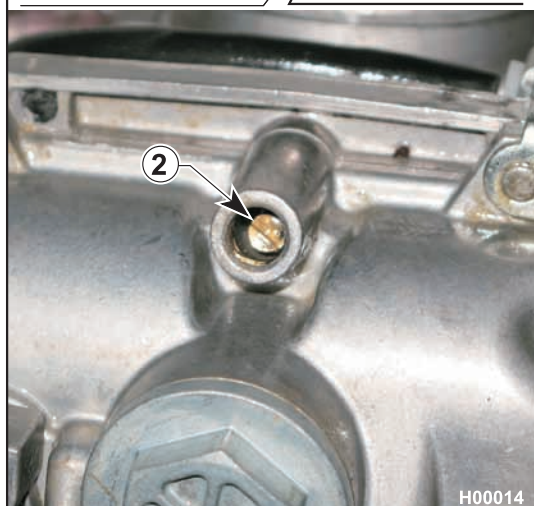
Adjust the carburettor with warm engine and with the throttle control in closed position. Proceed as follows:

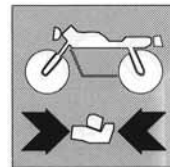
- turn the idle speed adjuster screw (1) located on the left-hand side of the vehicle, until setting idle RPM quite high (turn clockwise to increase the speed and counter clockwise to reduce the speed).
- Turn the adjuster screw (2) clockwise to fully closed position, and then turn it back 1.5 turns.
- Gradually loosen the screw (1) until achieving suitable idle speed setting.

NOTES

If the engine is difficult to start, the idle jet may be the wrong size. When this is the case: turn in the screw (2) to the fully closed position. If engine RPM does not change, you need to install a smaller jet. If the engine stalls before reaching the fully closed position when you tighten the screw (2), you need a larger jet. Change the jet and repeat the "Carburettor adjustment" procedure described above.

Sluggish acceleration or slow engine response at full throttle or a fouled spark plug may indicate a worn throttle valve, taper needle and main nozzle. Further details are given in the following pages (mixture enrichment).





Carburettor inspection (TC)

1. Check:

- Carburettor body

If dirty: clean.

NOTE

- Clean using petroleum based solvent. Blow all holes and jets with compressed air.
- Never use metal wire.

2. Check:

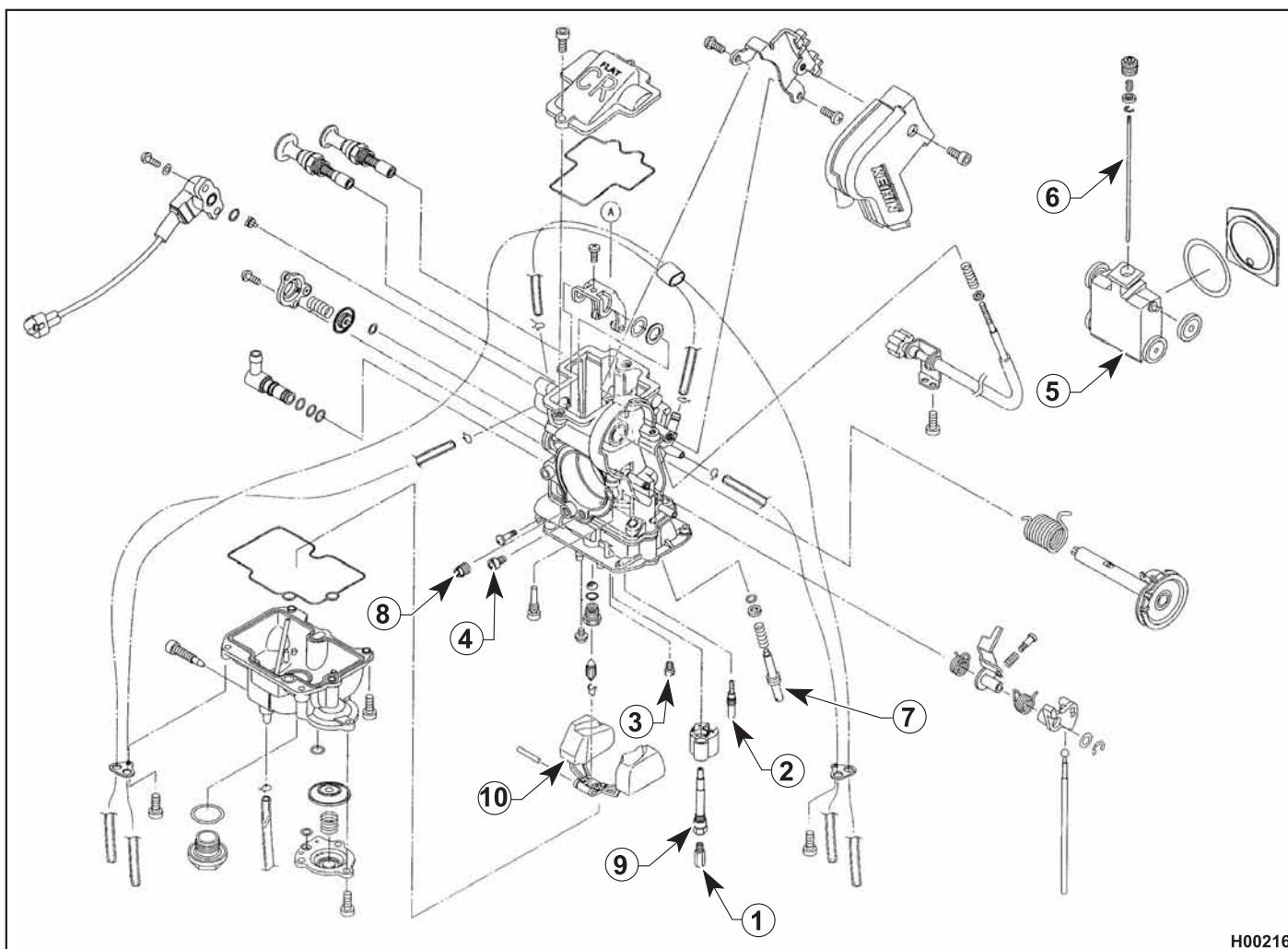
- Main jet (1)
- Idle jet (2)
- Main nozzle (9)
- Idle screw (7)
- Starting jet (3)
- Main air jet (4)
- Idle air jet (8)

If damaged: replace

If dirty: clean

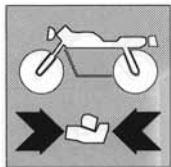
NOTE

- Clean using petroleum based solvent. Blow all holes and jets with compressed air.
- Never use metal wire.

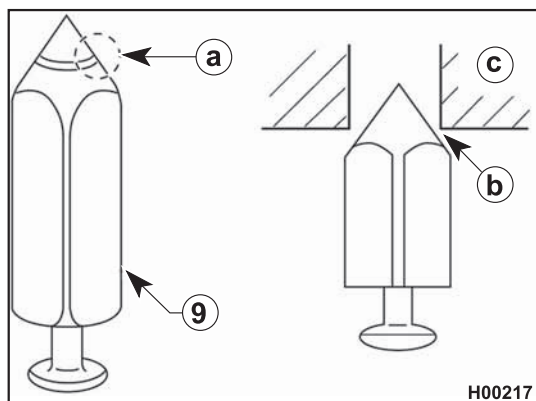


H00216



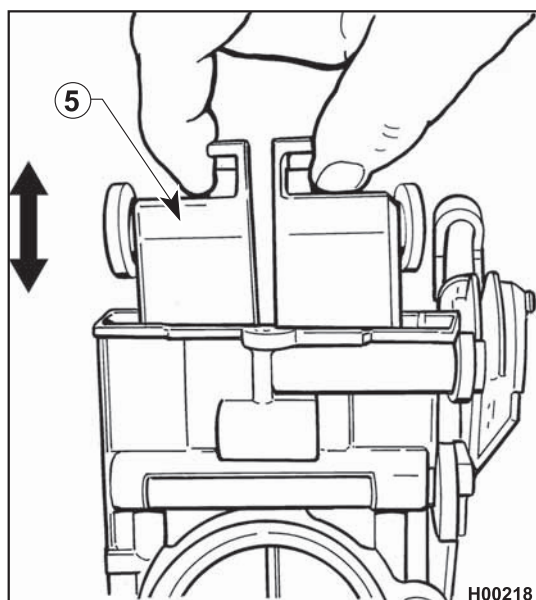


ENGINE OVERHAUL



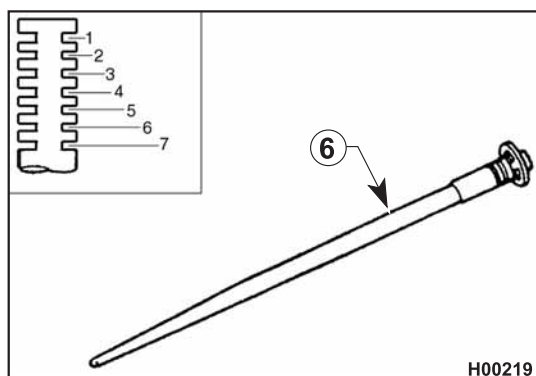
Needle assembly (TC)

Check needle (9) and valve seat (c). If worn (a): replace needle. If dirty: clean.



Throttle valve (TC)

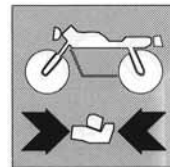
Check that the valve moves freely.
Repair or replace if stuck. Insert the throttle valve (5) into carburettor body and make sure that it moves freely.



Taper needle (TC)

Check the taper needle (6).
If bent or worn: replace.
Standard setting: 6th groove.





Floater height (TC)

Measure:

- height (a).

If outside specifications: adjust.

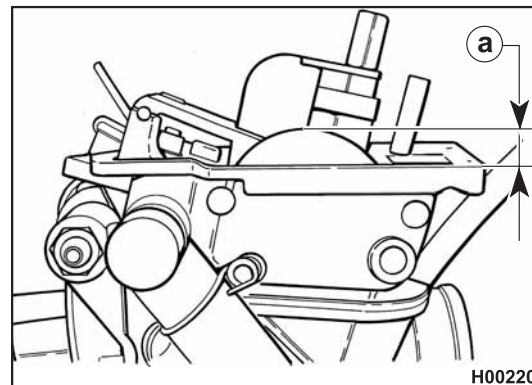
Floater height: 8 mm (0.3149 in.).

Measurement and adjustment points:

- Clamp the carburettor in an upside down position.

NOTE

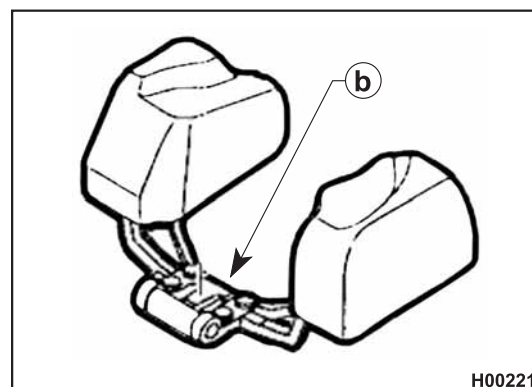
- Slowly tilt the carburettor and take the measurement when the needle is aligned with the floater arm.
- With the carburettor in a horizontal position, the floater weight pushing on the needle will affect the measurement.
- Measure the distance of the bowl mating face to the top edge of the floater with a calliper.



NOTE

The floater arm should be resting, but not pressing on the needle.

- If floater height is not as specified, check valve seat and valve.
- If either one is worn, replace both.
- If both parts are in good condition, adjust floater height bending the tab (b) on the floater.
- Check the floater height again.

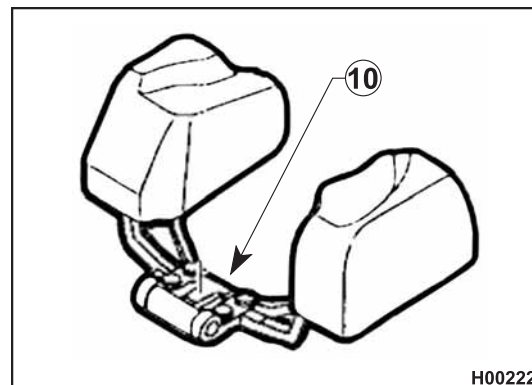


Floater (TC)

Check:

- The floater (10).

Replace it if damaged.

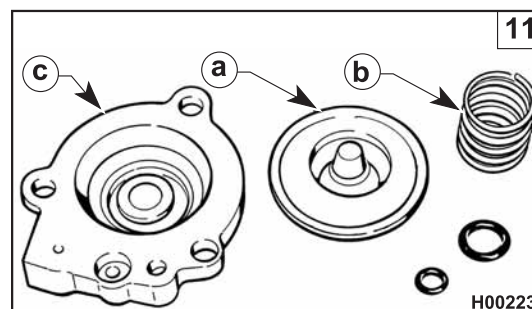


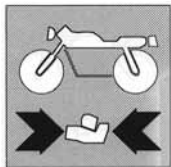
Accelerator pump (TC)

Check:

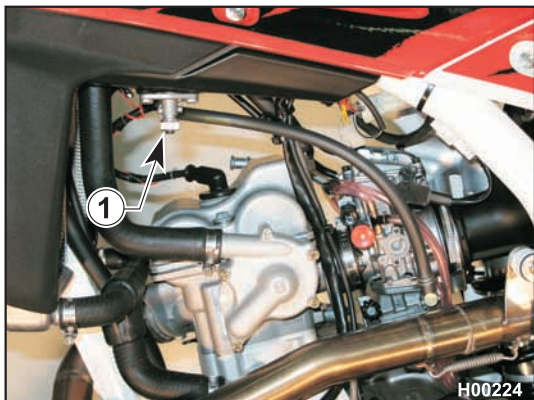
- The diaphragm (a) of the accelerator pump (11).
- The spring (b).
- The cover (c).

Replace the diaphragm if damaged.





ENGINE OVERHAUL



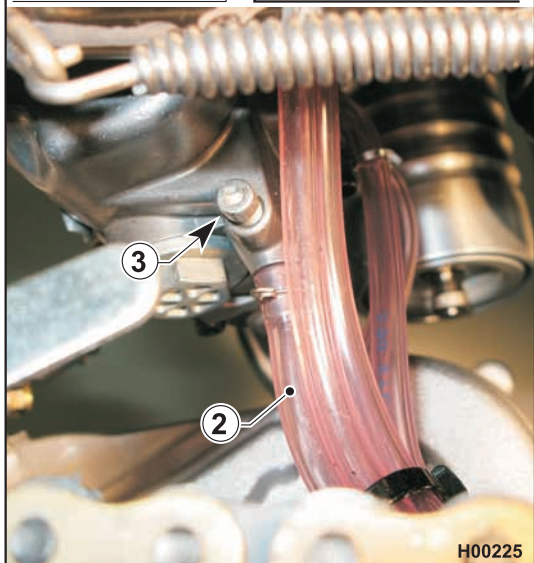
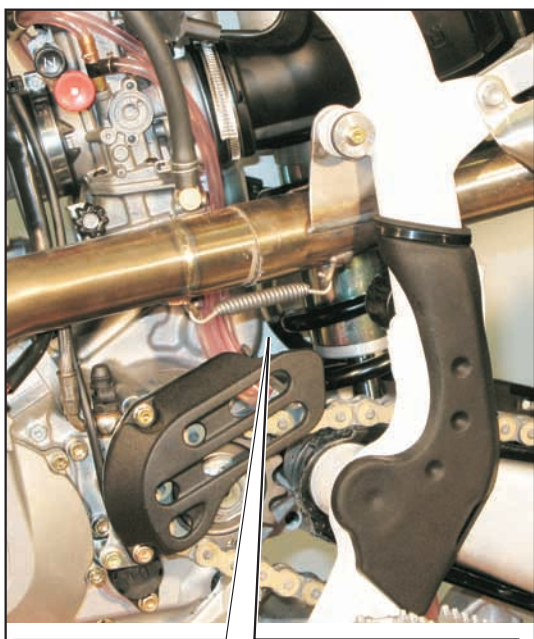
Draining the fuel (TC)

When you need to drain the fuel from the carburetor float bowl, close the cock tightening the ring nut (1). Insert the end of the hose (2) in a pan, slacken the drain screw (3) at the bottom of the bowl and re-tighten it after draining all fuel.

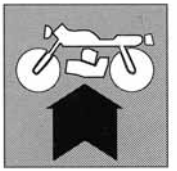


WARNING

Never release fuel into the environment or let the engine run indoors.



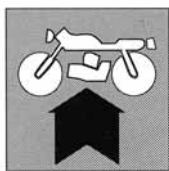
ENGINE REASSEMBLY



Section

H

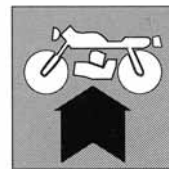




ENGINE REASSEMBLY

General.....	H.3
Assembly and lubrication instructions (CRANK- ALTERNATOR- LUBRICATION- LEFT CRANKCASE HALF)	H.4
Tightening torque figures	H.5
Assembly and lubrication instructions (GEARBOX - GEAR SHIFT CONTROL)	H.6
Tightening torque figures	H.7
Assembly and lubrication instructions (CLUTCH - KICK START- LUBRICATION- RIGHT CRANKCASE HALF)	H.10
Tightening torque figures	H.11
Assembly and lubrication instructions (RIGHT CRANKCASE HALF COVER).....	H.12
Tightening torque figures	H.13
Assembly and lubrication instructions (HEAD - CYLINDER - PISTON - TIMING SYSTEM - WATER PUMP - SPARK PLUG)	H.14
Tightening torque figures	H.15
Crankshaft assembly	H.16
Input shaft (5 SPEED)	H.19
Output shaft (5 SPEED)	H.20
Input shaft (6 SPEED)	H.22
Output shaft (5 SPEED)	H.23
Crankcase assembly	H.24
Gear shift control assembly	H.29
Kick start assembly.....	H.33
Timing chain and primary drive assembly	H.34
Clutch assembly	H.37
Sprocket installation	H.39
Flywheel installation (TC)	H.40
Flywheel and starter motor installation (TE-TXC).....	H.41
Flywheel installation (TC)	H.42
Assemble the starter motor (7)	H.42
Piston ring installation.....	H.43
Piston and cylinder installation	H.43
Cylinder head gasket selection table	H.45
Cylinder head installation	H.46
Timing chain tensioner installation	H.48
Camshaft installation	H.49
Flywheel cover installation (TC)	H.51
Neutral sensor installation	H.52
Starter motor seat cover installation (TC).....	H.53
Cylinder head cover, spark plug, oil feed hose installation.....	H.53
Right crankcase assembly.....	H.54
Filter and drain plug.....	H.56
Oil feed hose installation	H.56
Gear shift and kick start pedal installation.....	H.57
Installing the engine and assembling the motorcycle.....	H.58

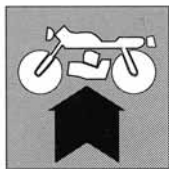




General

To reassemble, reverse the disassembly procedure. Any special instructions concerning reassembly are expressly highlighted in the text. Always replace gaskets, oil seals, metal retainers, sealing washers made from deformable material (copper, aluminium, fibre, etc.) and self-locking nuts after removal. Bearing specifications and dimensions have been calculated for a certain life. We recommend replacing the bearings - especially those exposed to heavy loading - also considering that checking them for wear is not an easy procedure. These recommendations are in addition to the dimensional checks of individual components specified in the relevant section (see Section G "ENGINE OVERHAUL"). Cleaning all components thoroughly is critical to reliability; bearings and any wear parts must be lubricated with engine oil before assembly. Screws, nuts and bolts must be tightened to the specified torque (see pages H.4-H.15 and Section X "TIGHTENING TORQUE FIGURES").

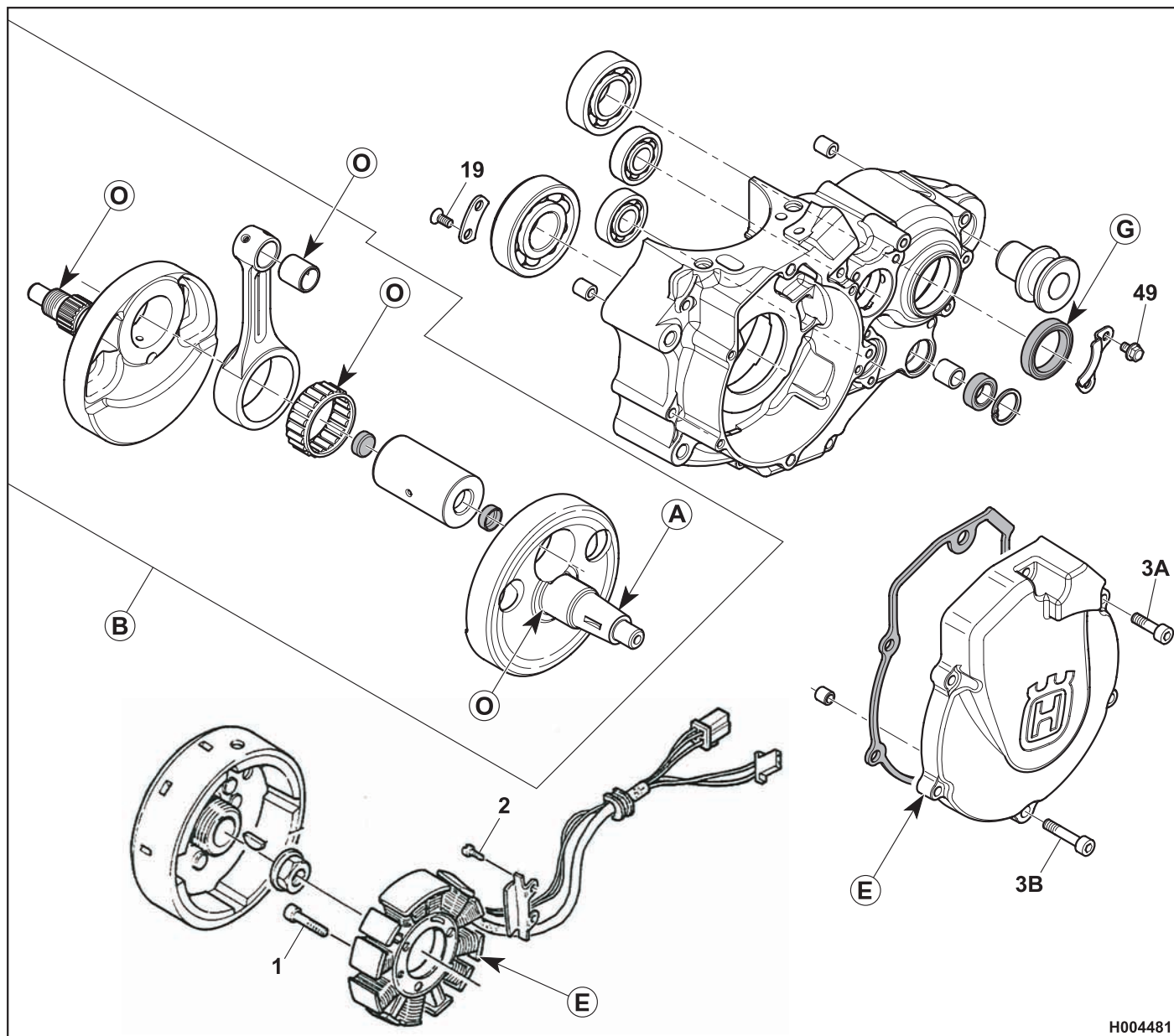




ENGINE REASSEMBLY

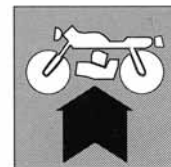
Assembly and lubrication instructions

CRANK- ALTERNATOR- LUBRICATION- LEFT CRANKCASE HALF



H004481



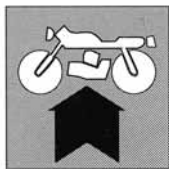


Tightening torque figures

1		M5 - L20 (Loctite 272)	6 Nm- 0.6 Kgm- 4.43 ft/lb
2		M5 - L12 (Loctite 272)	6 Nm- 0.6 Kgm- 4.43 ft/lb
3A	TC	M5 - L18	6 Nm- 0.6 Kgm- 4.43 ft/lb
3A	TE TXC	M5 - L35	6 Nm- 0.6 Kgm- 4.43 ft/lb
3B	TC	M5 - L25	6 Nm- 0.6 Kgm- 4.43 ft/lb
3B	TE TXC	M5 - L35	6 Nm- 0.6 Kgm- 4.43 ft/lb
19		M5x0.8 - L12 (Loctite 270 or 272)	8 Nm- 0.8 Kgm- 5.9 ft/lb
49		M5 - L8	6 Nm- 0.6 Kgm- 4.43 ft/lb

LUBRICATION POINTS-NOTES	LUBRICANT-INSTALLATION INSTRUCTIONS
A	Degrease
B	Apply engine oil on installation
E	Line up stator mark with cover mark
G	WATER RESISTANT grease
O	Engine oil



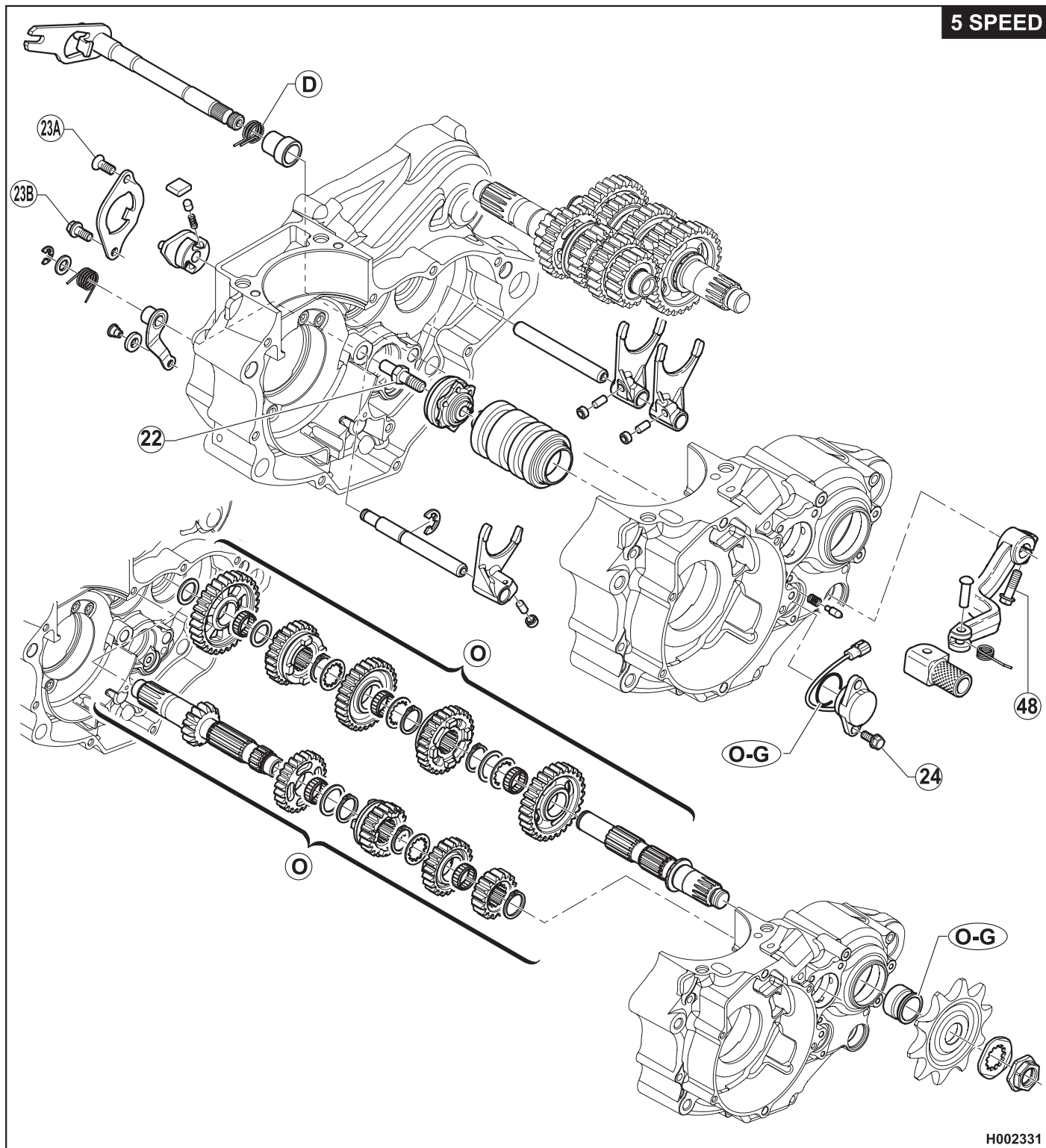


ENGINE REASSEMBLY

Assembly and lubrication instructions

GEARBOX - GEAR SHIFT CONTROL

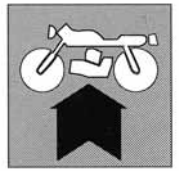
5 SPEED



H002331



ENGINE REASSEMBLY

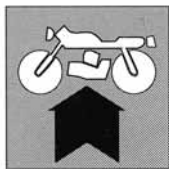


Tightening torque figures

22		M8x1.25 (+LOCTITE Alt. 243)	25 Nm- 2.55 Kgm- 18.44 ft/lb
23A		M6 - L13 (+LOCTITE 243)	8 Nm- 0.8 Kgm- 5.9 ft/lb
23B		M6 - L14 (+LOCTITE 243)	8 Nm- 0.8 Kgm- 5.9 ft/lb
24		M5x0.8 - L12	6 Nm- 0.6 Kgm- 4.43 ft/lb
48		M6 - L20	8 Nm- 0.8 Kgm- 5.9 ft/lb

LUBRICATION POINTS-NOTES	LUBRICANT-INSTALLATION INSTRUCTIONS
D	Install with open end pointing to engine centre
O	Engine oil
O/G	Engine oil or WATER RESISTANT grease



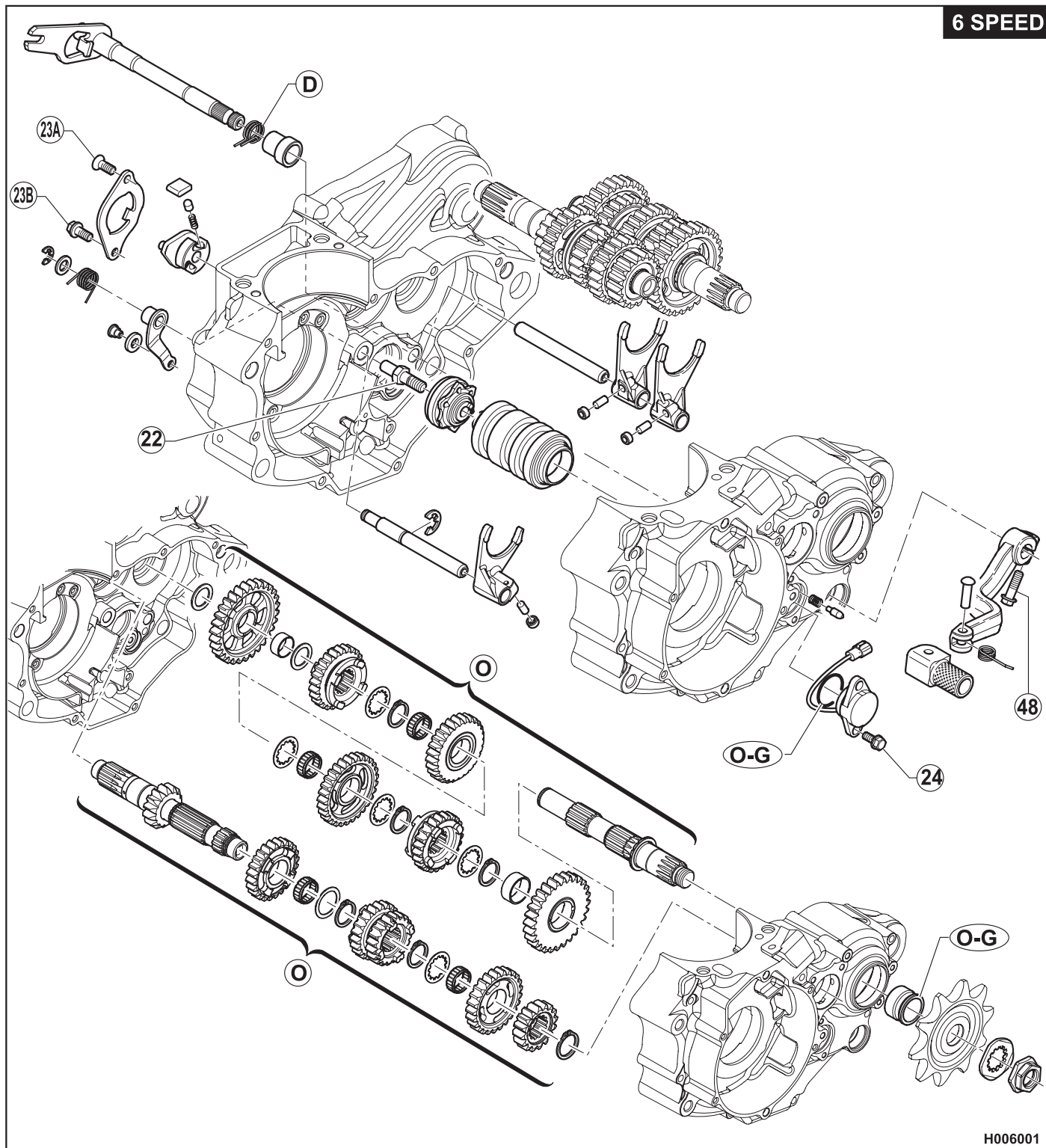


ENGINE REASSEMBLY

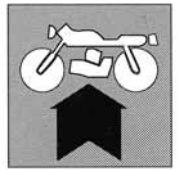
Assembly and lubrication instructions

GEARBOX - GEAR SHIFT CONTROL

6 SPEED



ENGINE REASSEMBLY

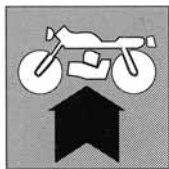


Tightening torque figures

22		M8x1.25 (+LOCTITE Alt. 243)	25 Nm- 2.55 Kgm- 18.44 ft/lb
23A		M6 - L13 (+LOCTITE 243)	8 Nm- 0.8 Kgm- 5.9 ft/lb
23B		M6 - L14 (+LOCTITE 243)	8 Nm- 0.8 Kgm- 5.9 ft/lb
24		M5x0.8 - L12	6 Nm- 0.6 Kgm- 4.43 ft/lb
48		M6 - L20	8 Nm- 0.8 Kgm- 5.9 ft/lb

LUBRICATION POINTS-NOTES	LUBRICANT-INSTALLATION INSTRUCTIONS
D	Install with open end pointing to engine centre
O	Engine oil
O/G	Engine oil or WATER RESISTANT grease

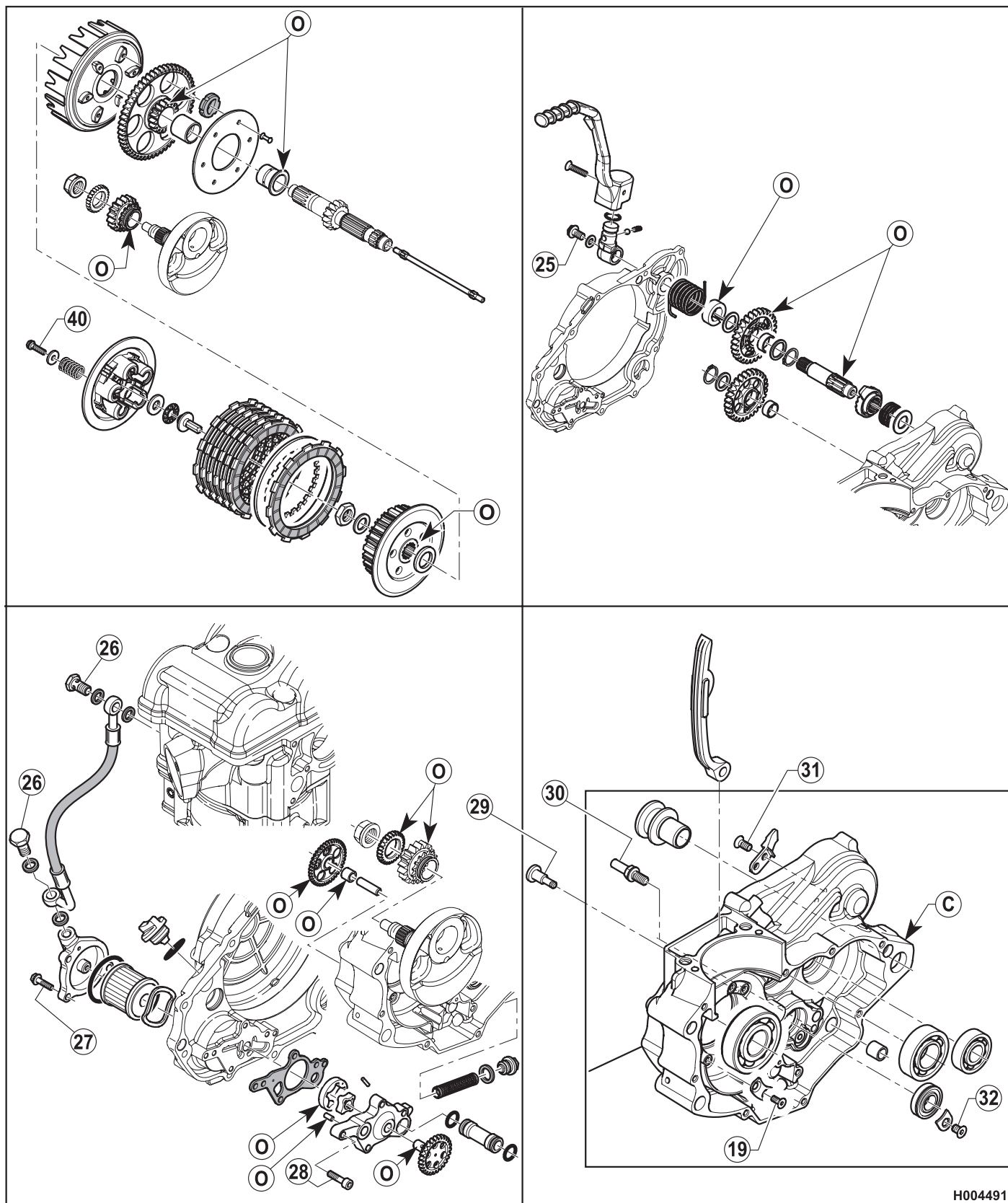




ENGINE REASSEMBLY

Assembly and lubrication instructions

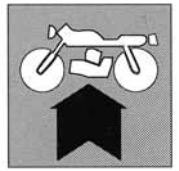
CLUTCH- KICK START- LUBRICATION- RIGHT CRANKCASE HALF



H004491



ENGINE REASSEMBLY

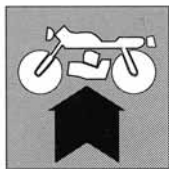


Tightening torque figures

19		M5 - L12 (+LOCTITE 270 or 272)	6 Nm- 0.6 Kgm- 4.43 ft/lb
26		M8 X 1.25 (Al)	8 Nm- 0.8 Kgm- 5.9 ft/lb
27		M5 - L16	8 Nm- 0.8 Kgm- 5.9 ft/lb
28		M5 x 0.8 - L20	6 Nm- 0.6 Kgm- 4.43 ft/lb
29		M6 x 1 (+LOCTITE 243)	8 Nm- 0.8 Kgm- 5.9 ft/lb
30		M8 x 1.25 (+LOCTITE Alt. 272)	25 Nm- 2.55 Kgm- 18.44 ft/lb
31		M6 - L14 (+LOCTITE Alt. 272)	8 Nm- 0.8 Kgm- 5.9 ft/lb
32		M6 - L10 (+LOCTITE Alt. 243)	8 Nm- 0.8 Kgm- 5.9 ft/lb
40		M6 - L20	8 Nm- 0.8 Kgm- 5.9 ft/lb

LUBRICATION POINTS-NOTES	LUBRICANT-INSTALLATION INSTRUCTIONS
O	Engine oil
O/G	Engine oil or WATER RESISTANT grease
C	Join crankcase halves using Loctite 5205

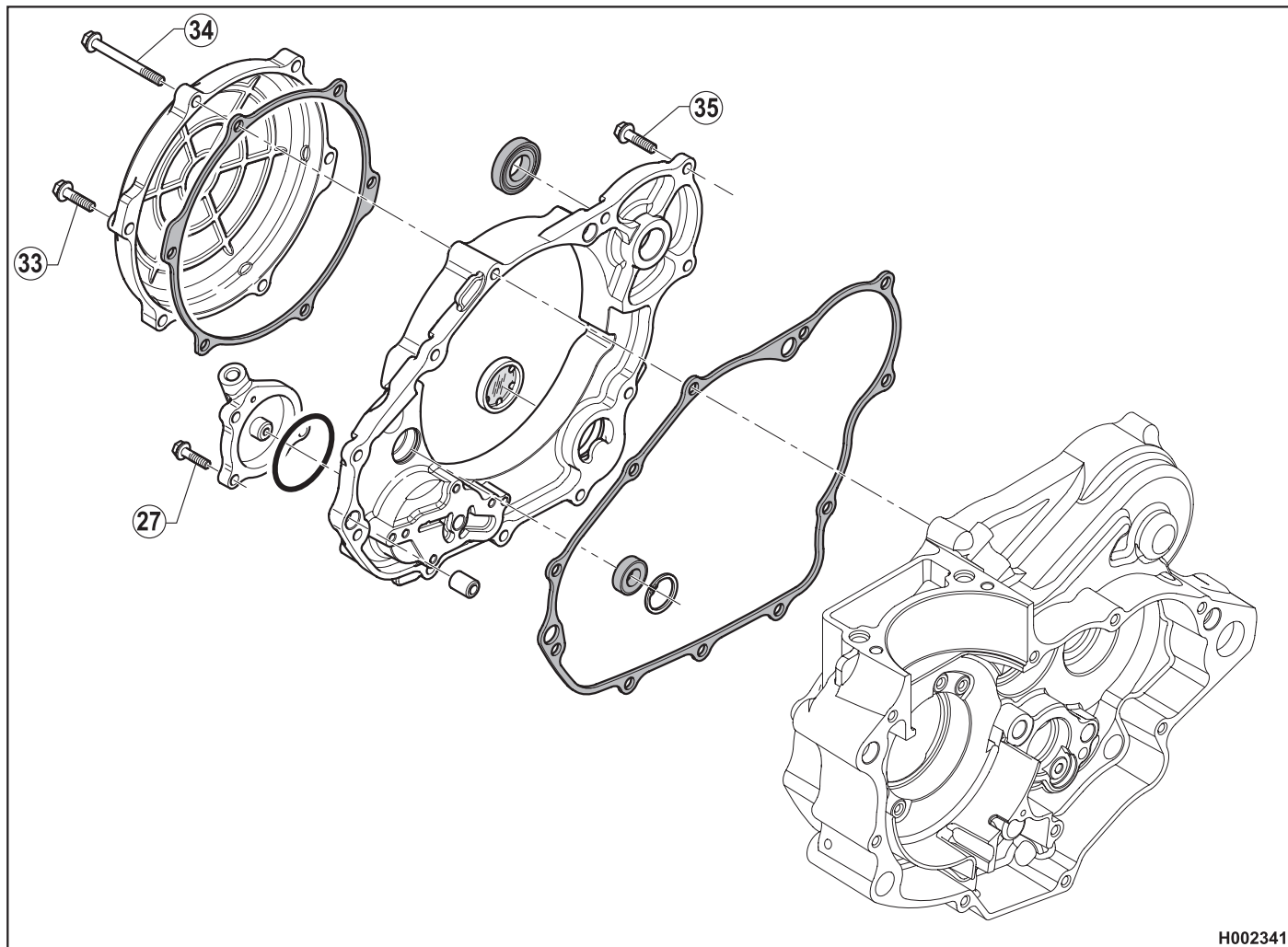




ENGINE REASSEMBLY

Assembly and lubrication instructions

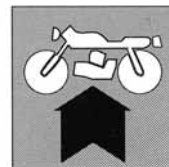
RIGHT CRANKCASE COVER



H002341



ENGINE REASSEMBLY

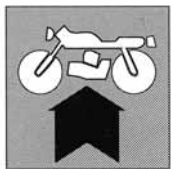


Tightening torque figures

27		M5 - L16	6 Nm- 0.6 Kgm- 4.43 ft/lb
33		M6 - L22	8 Nm- 0.8 Kgm- 5.9 ft/lb
34		M6 x 1 - L50	8 Nm- 0.8 Kgm- 5.9 ft/lb
35		M6 x 1 - L20	8 Nm- 0.8 Kgm- 5.9 ft/lb

LUBRICATION POINTS-NOTES	LUBRICANT-INSTALLATION INSTRUCTIONS
O	Engine oil
O/G	Engine oil or WATER RESISTANT grease

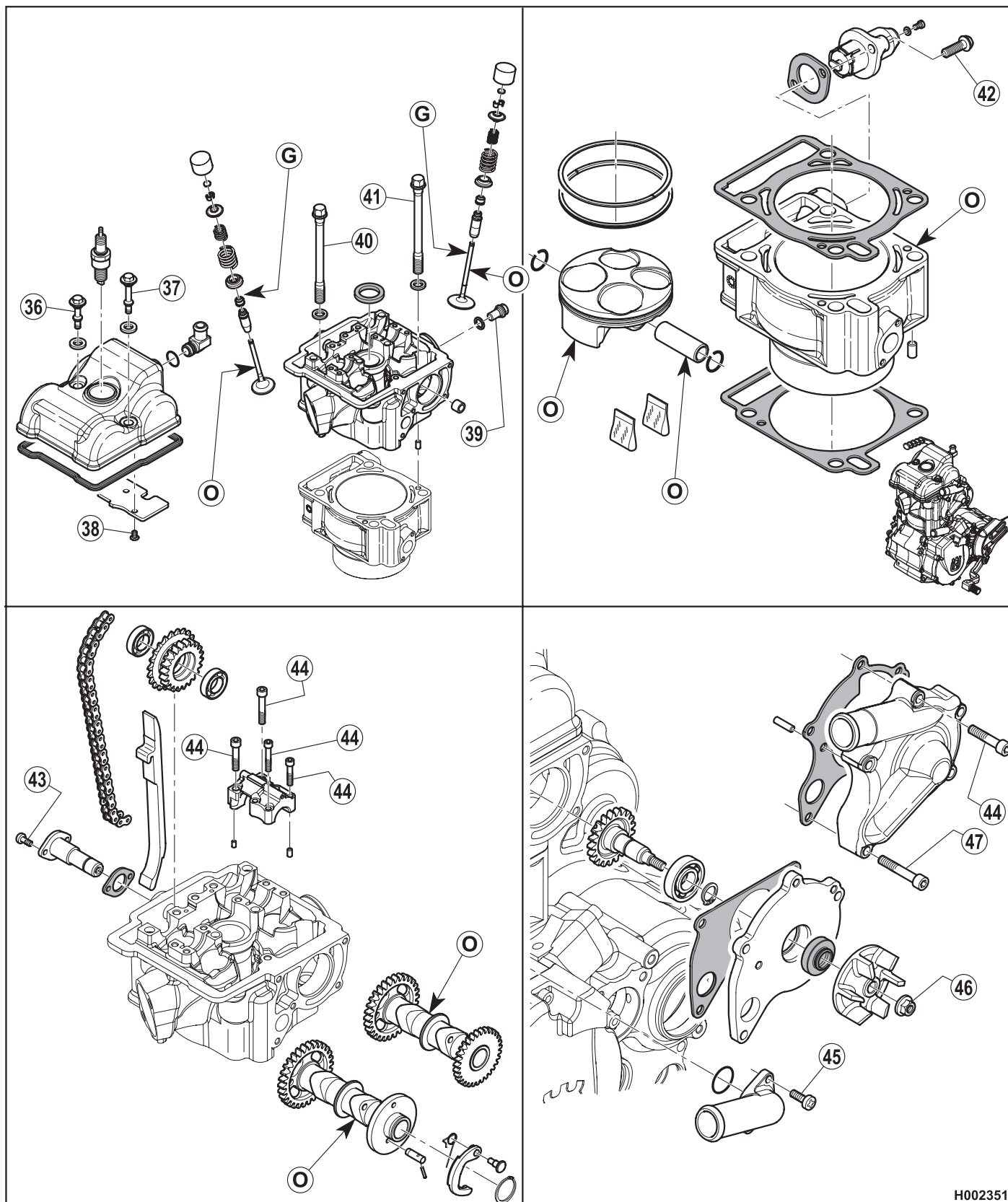




ENGINE REASSEMBLY

Assembly and lubrication instructions

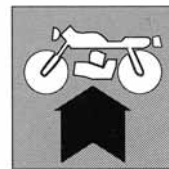
HEAD - CYLINDER - PISTON - TIMING SYSTEM - WATER PUMP - SPARK PLUG



H002351



ENGINE REASSEMBLY

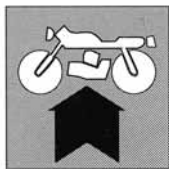


Tightening torque figures

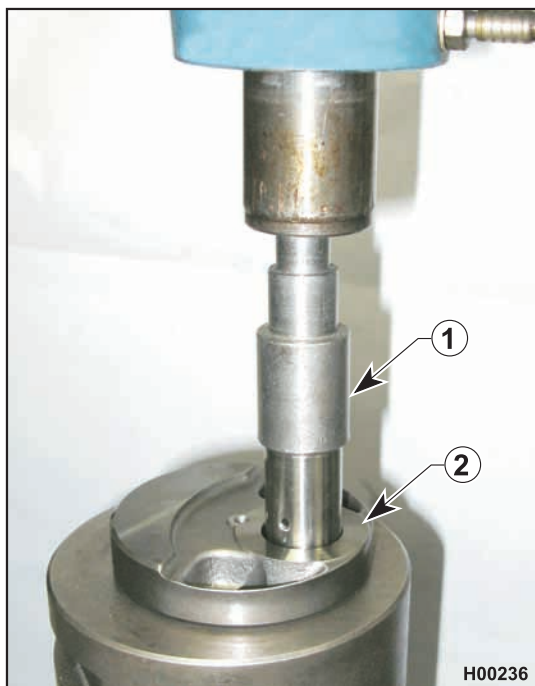
36		Special flanged screw L.23.4	8 Nm- 0.8 Kgm- 5.9 ft/lb
37		Special flanged screw L.31.3	8 Nm- 0.8 Kgm- 5.9 ft/lb
38		M5 x 0.8 - L8 (+LOCTITE 243)	6 Nm- 0.6 Kgm- 4.43 ft/lb
39		M10 x 1.25	5 Nm- 0.5 Kgm- 3.69 ft/lb
40		M10 - L104.5	40 Nm- 4 Kgm- 29.5 ft/lb
41		M10 - L104.5	40 Nm- 4 Kgm- 29.5 ft/lb
42		M6 - L20	8 Nm- 0.8 Kgm- 5.9 ft/lb
43		M4 - L10	3 Nm- 0.3 Kgm- 2.21 ft/lb
44		M5 - L25	6 Nm- 0.6 Kgm- 4.43 ft/lb
45		M4 - L12 (+LOCTITE 243)	3 Nm- 0.3 Kgm- 2.21 ft/lb
46		M5 (+LOCTITE 270 or 272)	6 Nm- 0.6 Kgm- 4.43 ft/lb
47		M5 - L30	1 Nm- 0.6 Kgm- 0.74 ft/lb

LUBRICATION POINTS-NOTES	LUBRICANT-INSTALLATION INSTRUCTIONS
F	Use sealant "AREXONS RHODORSEAL 5552" on installation
G	WATER RESISTANT grease
O	Engine oil





ENGINE REASSEMBLY



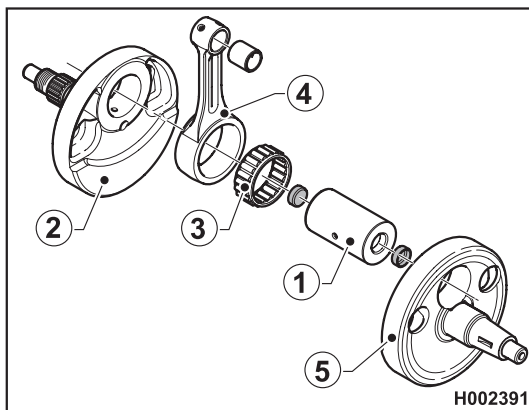
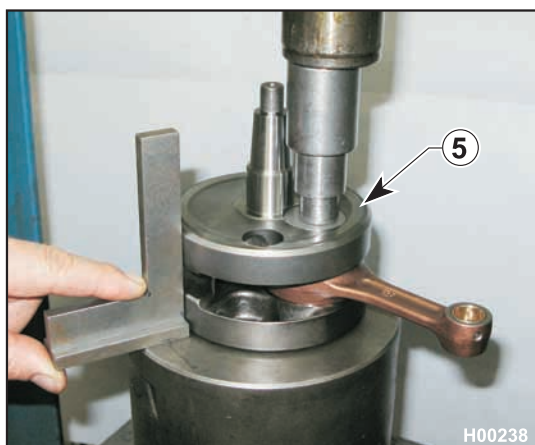
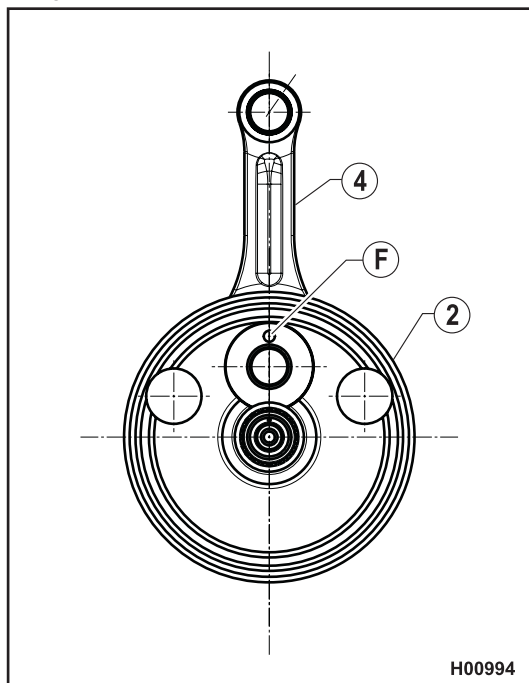
Crankshaft assembly

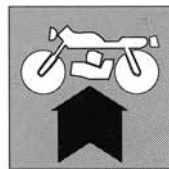
Clean the oil galleries thoroughly. Lubricate the crank pin (1) with engine oil and insert it into the flywheel half (2).



WARNING: Position the crank pin (1) so that hole "F" is lying on the same axis as connecting rod (4) and flywheel half (2).

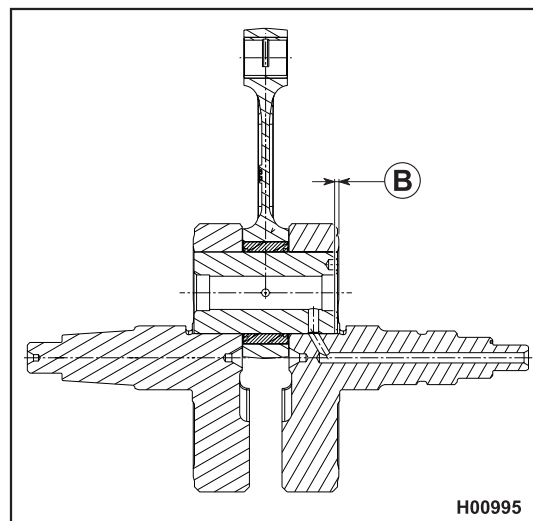
Fit the needle roller bearing (3) and lubricate it the engine oil. Install the connecting rod (4) and the second flywheel half (5) and align the two flywheel halves using a square.





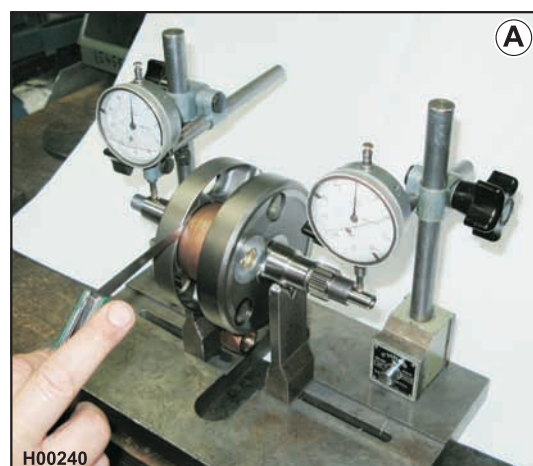
Finally, join the parts using a press.

Make sure the pin does not protrude at either ends as you join the flywheel halves. When driving the pin, observe the specified distance "B".



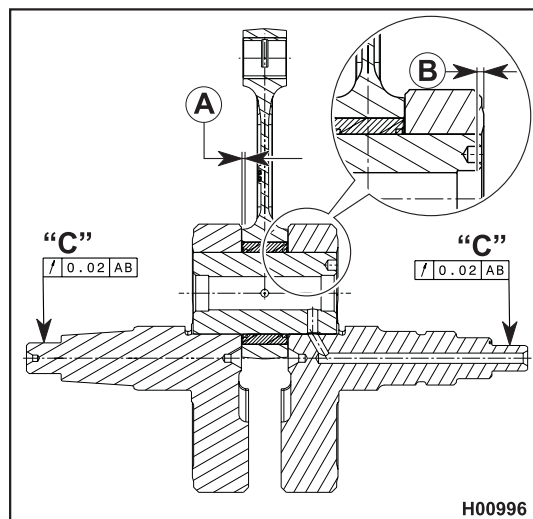
Measure connecting rod axial clearance in the flywheels. It should be 0.25 ± 0.43 mm. Measure crankshaft runout at the bearing locations "C". Runout must not exceed 0.02 mm.

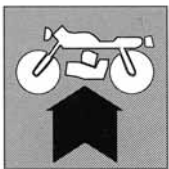
Straighten the crankshaft using a copper hammer.



A = 0.25 - 0.43 mm
(0.0098-0.0169 in.)

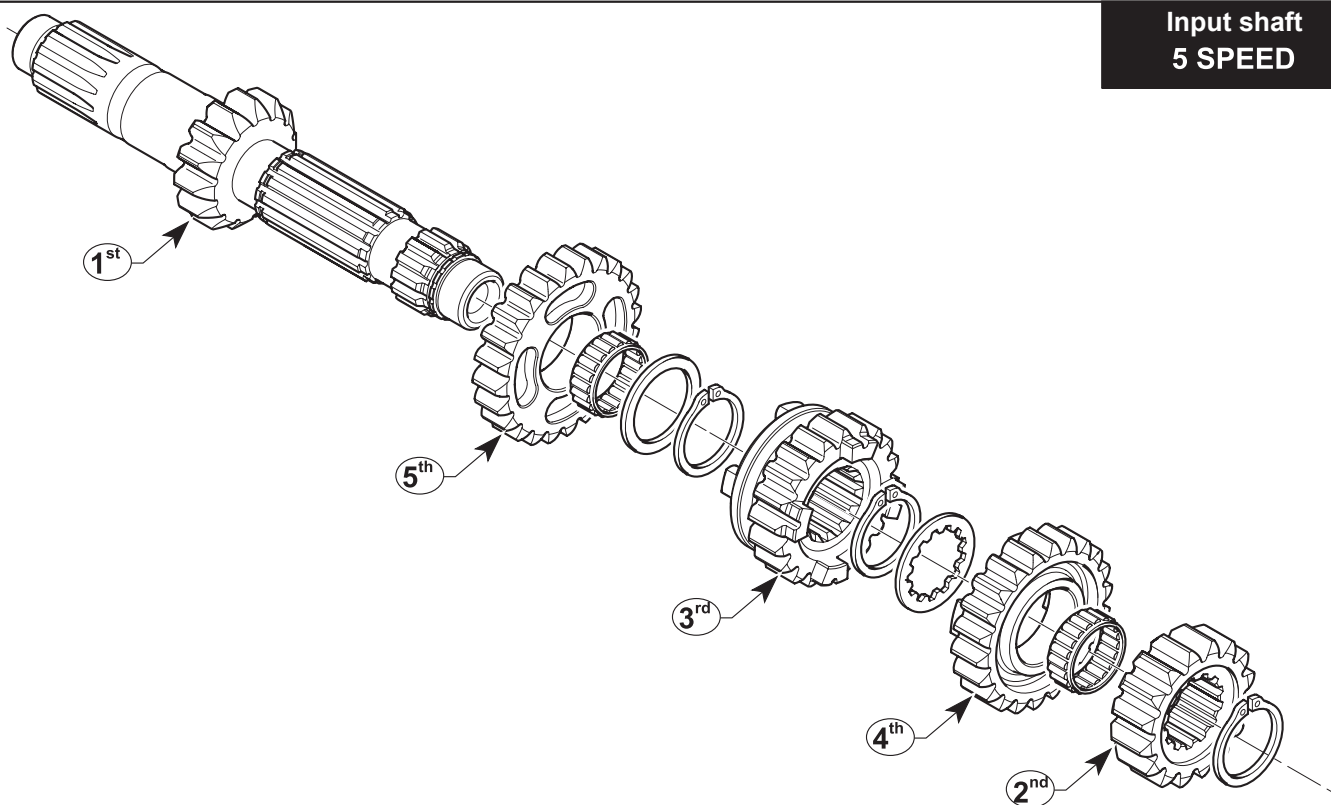
B = 0.5 mm (0.02 in.)
Aligned with flywheel half





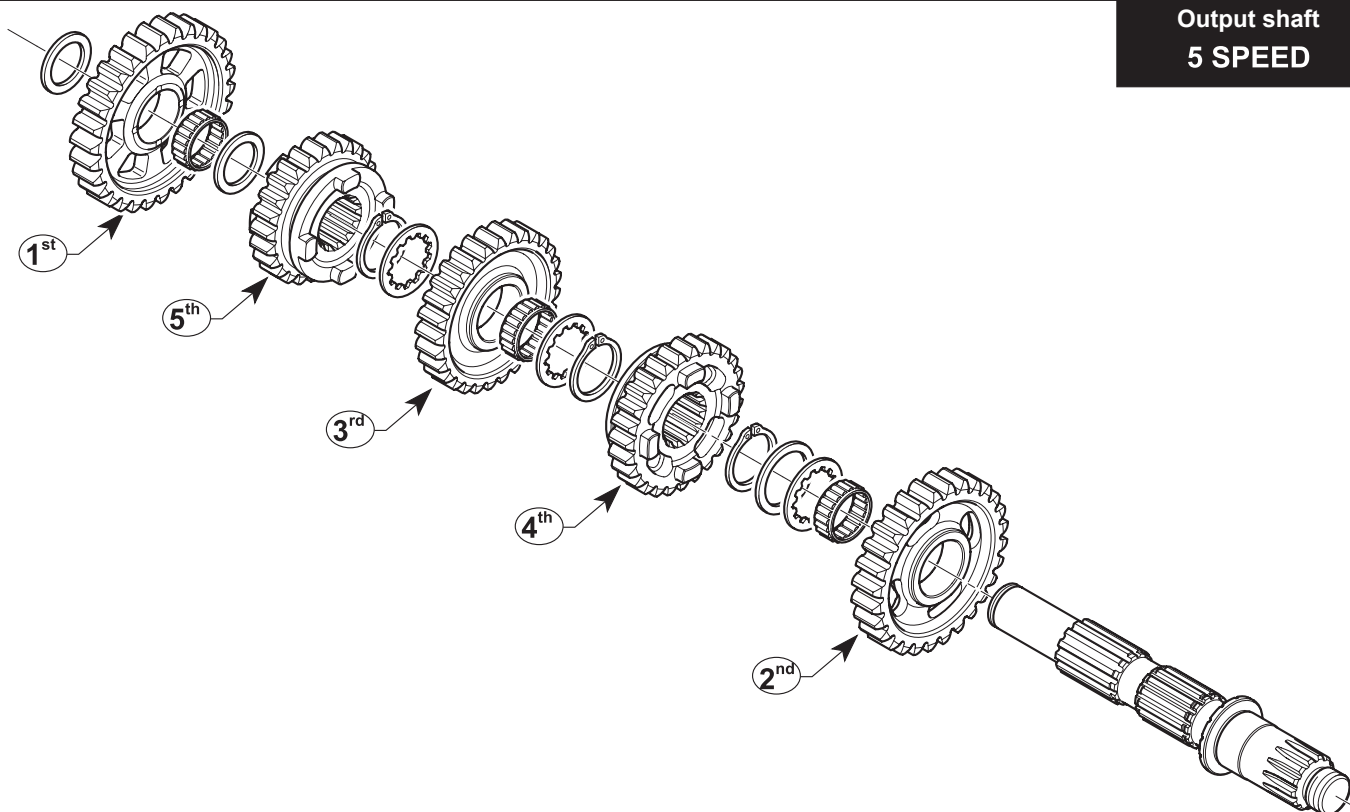
ENGINE REASSEMBLY

Input shaft
5 SPEED



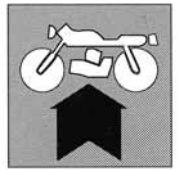
H00241

Output shaft
5 SPEED



H00242



**Input shaft (5 SPEED)**

Fit roller cage (1) and 5th gear (2) on the bushing and then install the washer (3) and the retaining ring (4). The washer must be placed between gear and retaining ring. Fit 3rd gear (5), retaining ring (6) and washer (7).

Fit the roller cage (8).

Fit 4th gear (9).

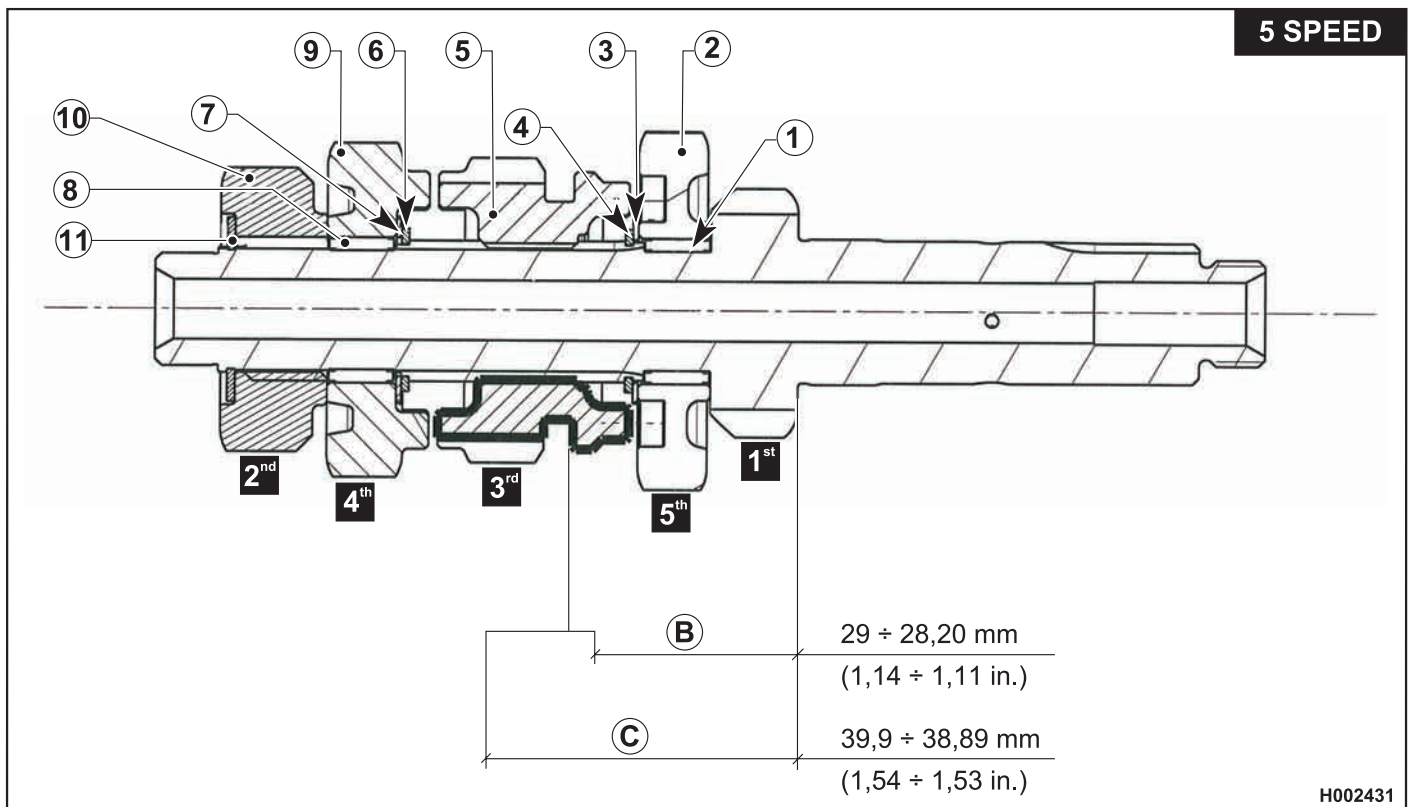
Fit 2nd gear (10).

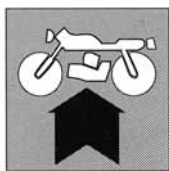
Fit the circlip (11).

B: with 5th gear engaged

C: with 4th gear engaged

D: lubricate with MOLYKOTE G-n plus





ENGINE REASSEMBLY

Output shaft (5 SPEED)

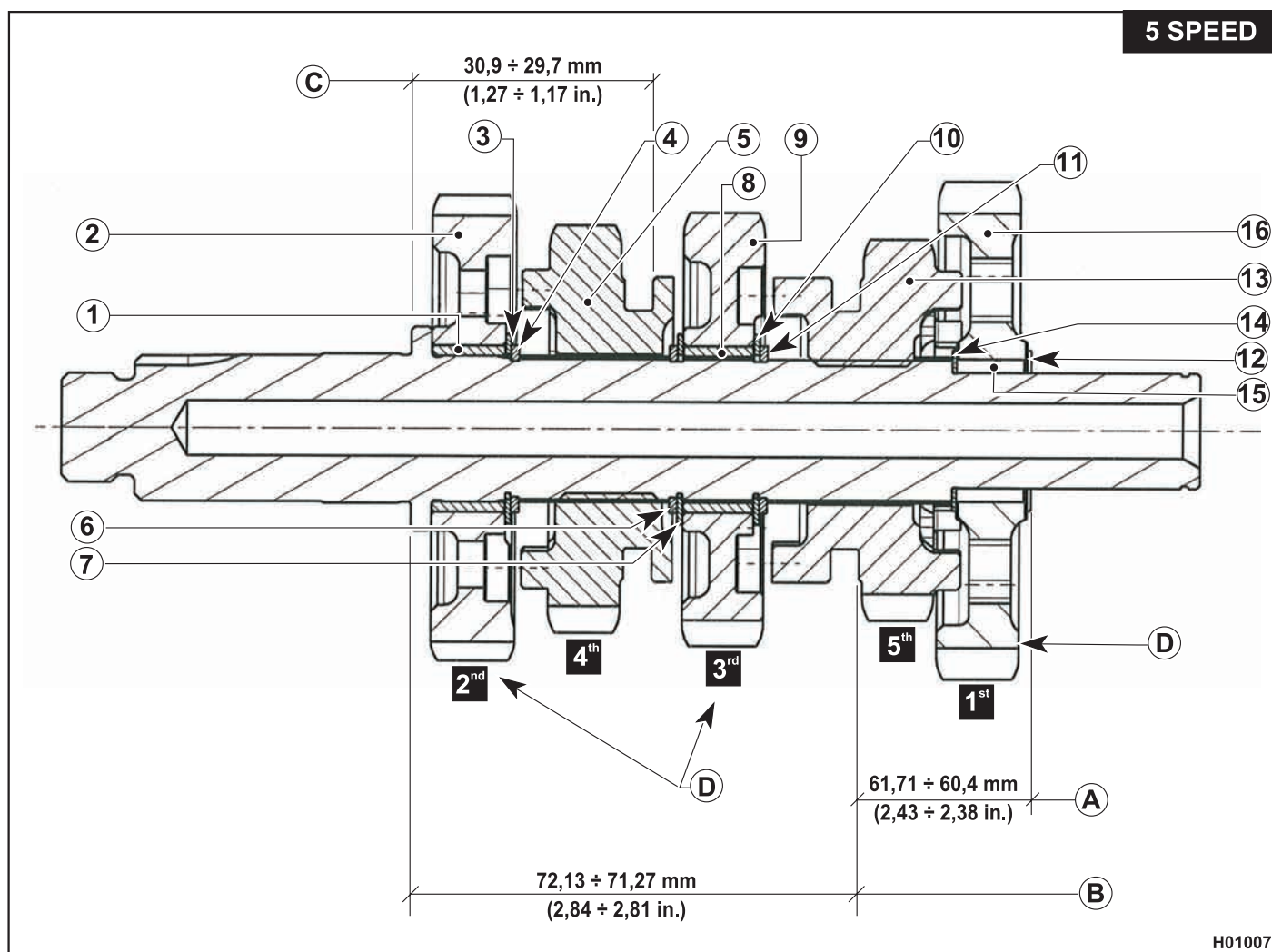
Fit the roller cage (1).
Fit 2nd gear (2), washer (3) and retaining ring (4).
Fit 4th gear (5) and retaining ring (6).
Fit the washer (7).
Fit roller cage (8) and 3rd gear (9).
Fit washer (10) and retaining ring (11).
Apply "MOLYKOTE G-n plus" on the 3rd gear (9).
Fit 5th gear (13) and washer (14).
Fit roller cage (15), 1st gear (16) and washer (12).

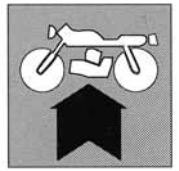
A: with 1st gear engaged

B: with 3rd gear engaged

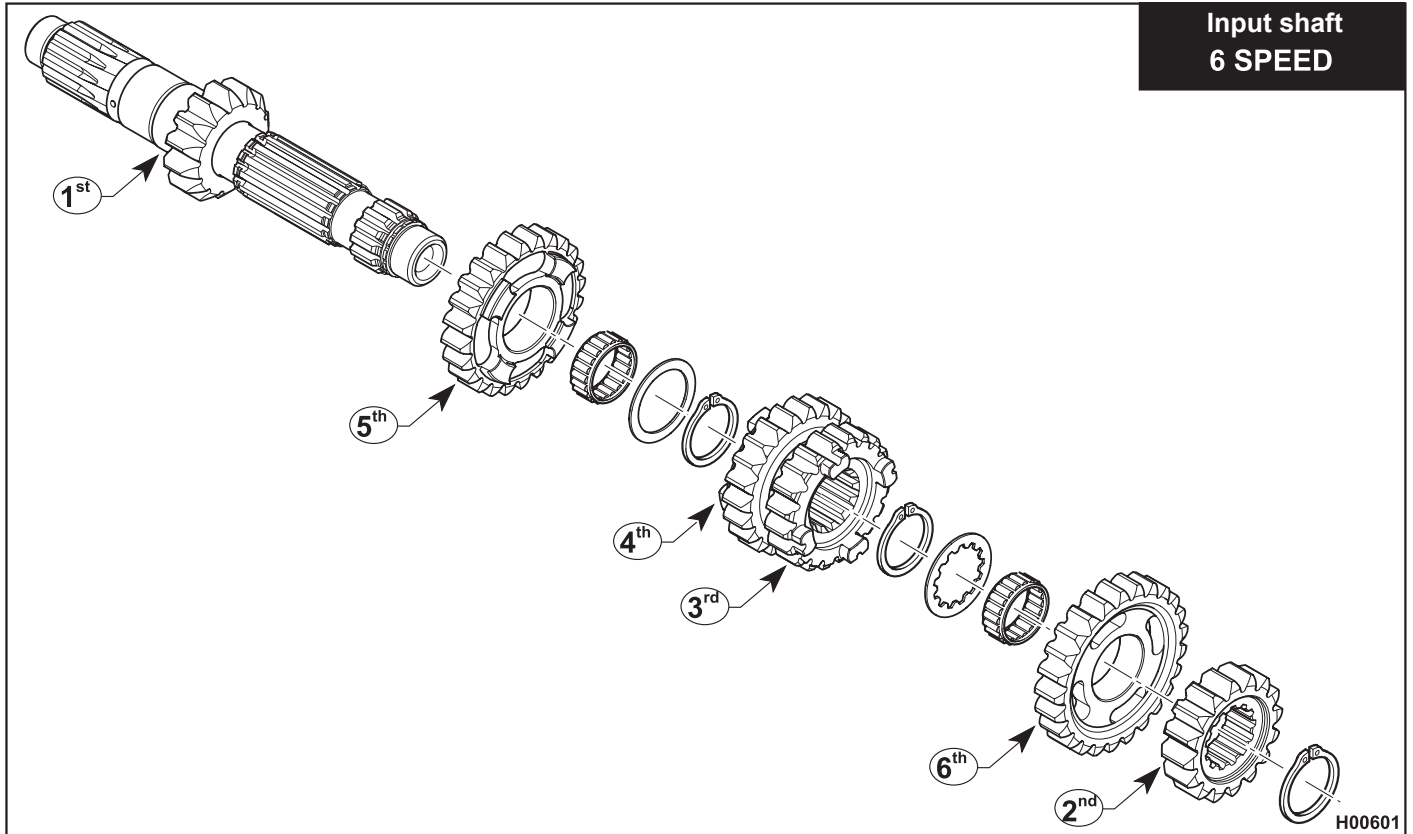
C: with 2nd gear engaged

D: lubricate with MOLYKOTE G-n plus

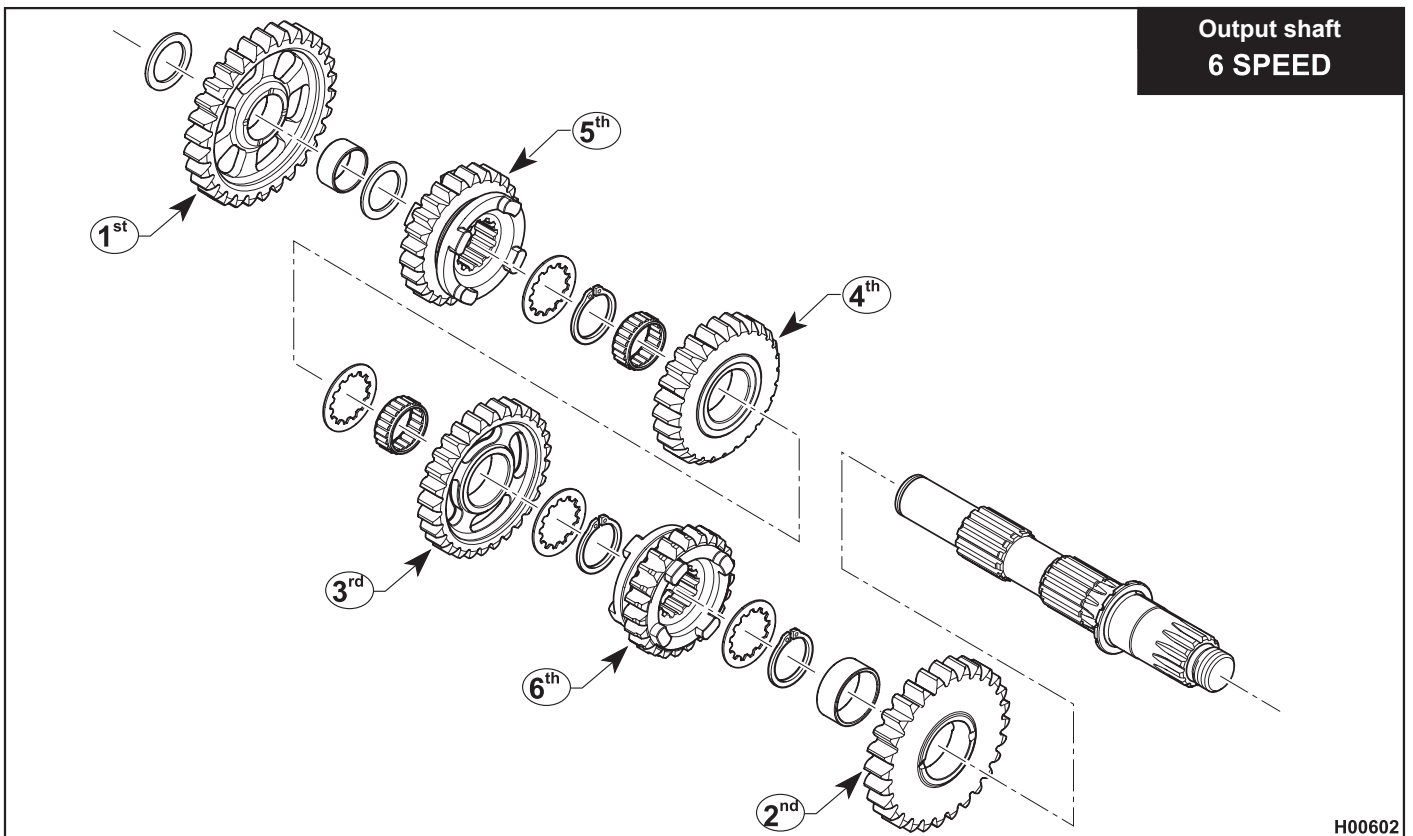


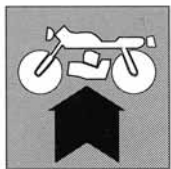


**Input shaft
6 SPEED**



**Output shaft
6 SPEED**





ENGINE REASSEMBLY

Input shaft (6 SPEED)

Fit roller cage (1) and 5th gear (2) on the bushing and then install the washer (3) and the retaining ring (4). The washer must be placed between gear and retaining ring. Fit 3rd/4th gear (5), retaining ring (6) and washer (7).

Fit the roller cage (8).

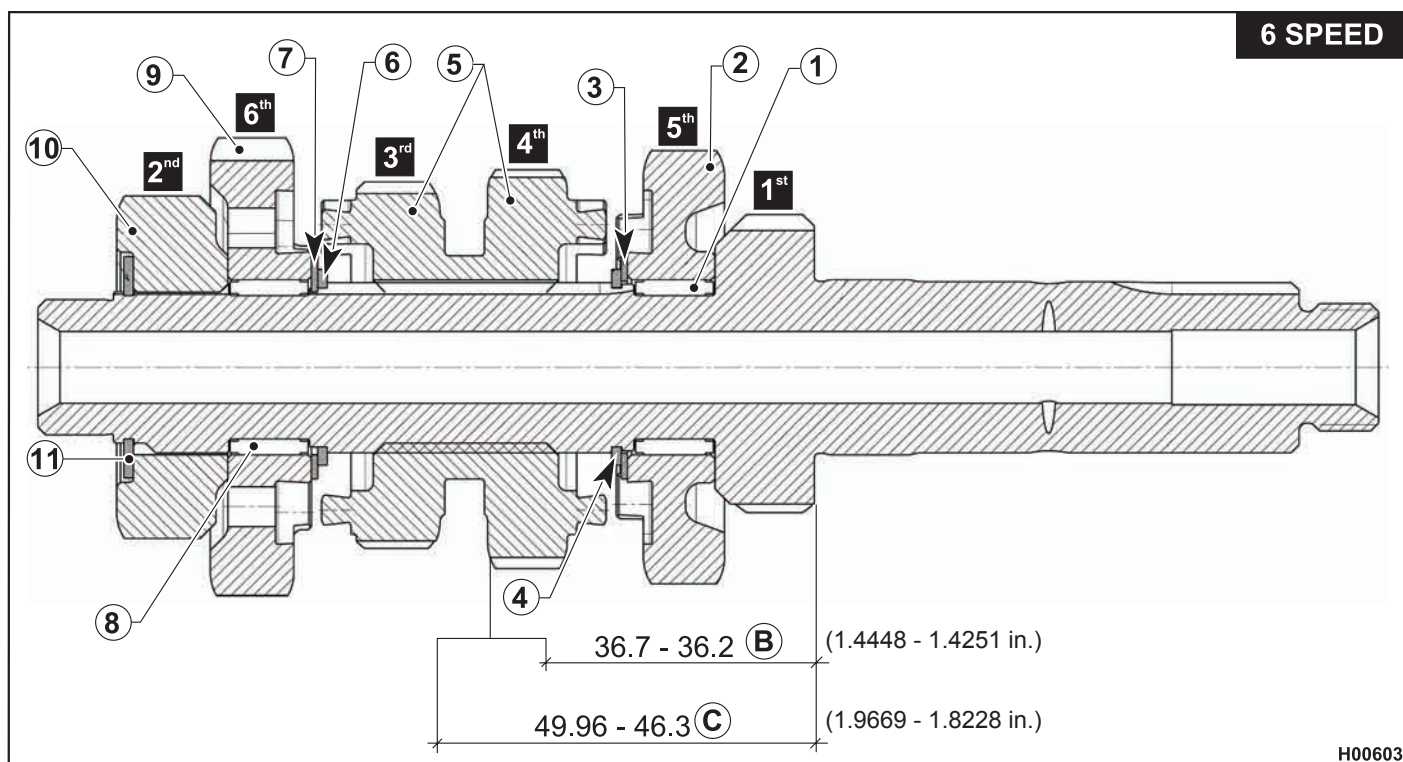
Fit 6th gear (9).

Fit 2nd gear (10).

Fit the circlip (11).

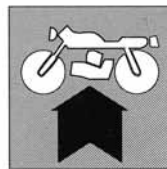
B: with 5th gear engaged and 5th gear in contact with 1st gear.

C: with 4th gear in contact with 6th gear.

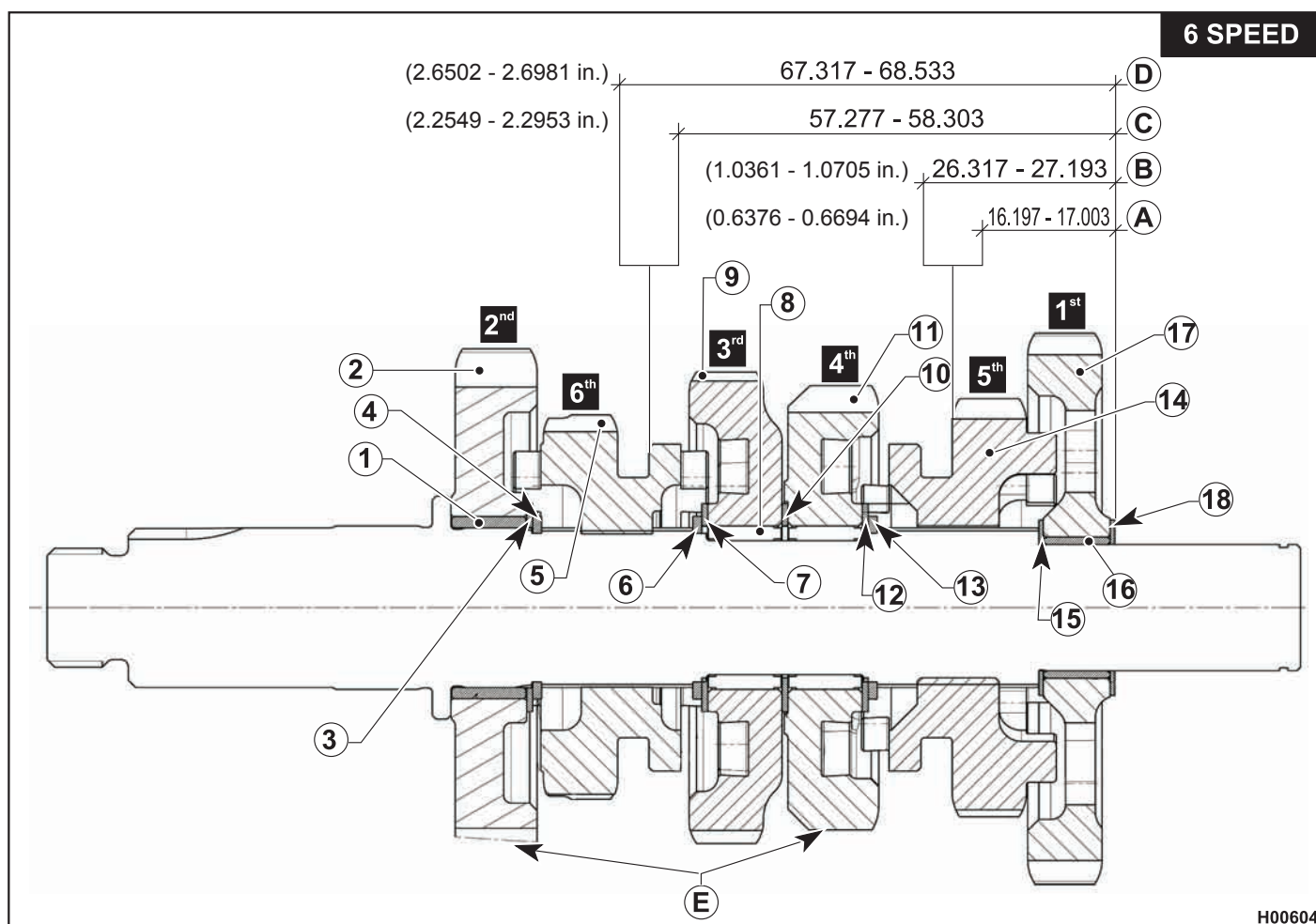


H00603



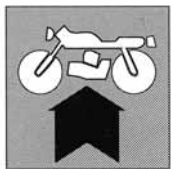
**Output shaft (6 SPEED)**

- Fit the roller cage (1).
 Fit 2nd gear (2), washer (3) and retaining ring (4).
 Fit 6th gear (5) and retaining ring (6).
 Fit the washer (7).
 Fit roller cage (8) and 3rd gear (9).
 Fit washer (10) and 4th gear (11).
 Fit washer (12) and retaining ring (13).
 Apply "MOLYKOTE G-n plus" on the 4th gear (11).
 Fit 5th gear (14) and washer (15).
 Fit roller cage (16), 1st gear (17) and washer (18).

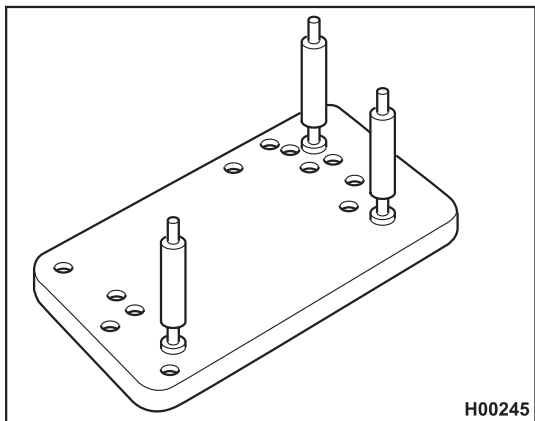


- A:** Control dimension with 1st gear engaged and 1st gear butted up on the shaft.
B: Control dimension with 4th gear engaged and 4th gear butted up against shaft, washer and circlip.
C: Control dimension with 3rd gear engaged and 1st and 3rd gears and their washers and circlips butted up together on the shaft.
D: Control dimension with 2nd gear engaged and 2nd and 1st gears butted up together on the shaft.





ENGINE REASSEMBLY



H00245

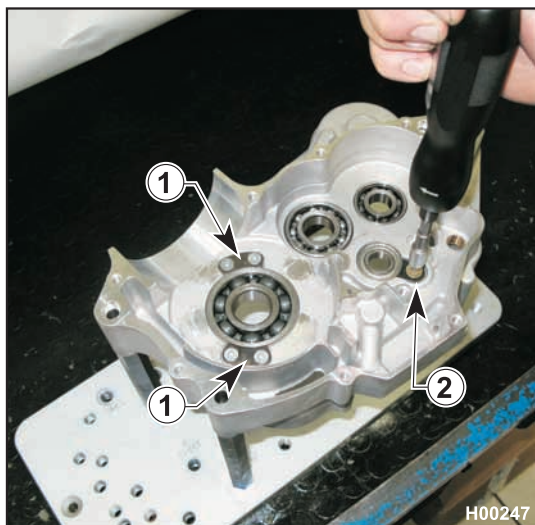
Crankcase assembly

Clean the crankcase half mating faces and place crankcase half on tool no. 8A00 90662.

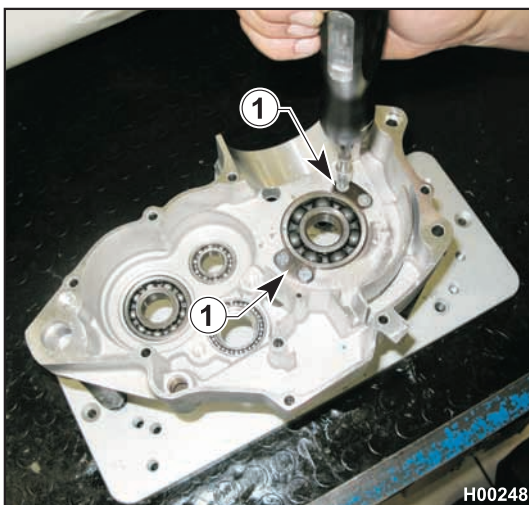


H00246

- Heat up to around 125 °C and drive the ball bearings into each crankcase half using a suitable driver tool.
- Fit the retaining plates (1) and (2) to the crankcase bearings.
(5 Nm, 0.5 Kgm, 3.6 ft/lb + Loctite 272) for crankshaft bearing retaining plate (1).
(11 Nm, 1.1 Kgm, 7.9 ft/lb + Loctite 272) for right-hand bearing retaining plate (2).



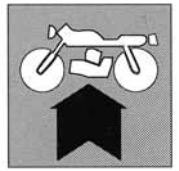
H00247



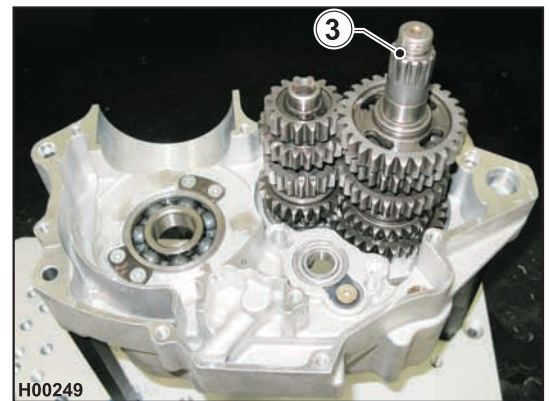
H00248



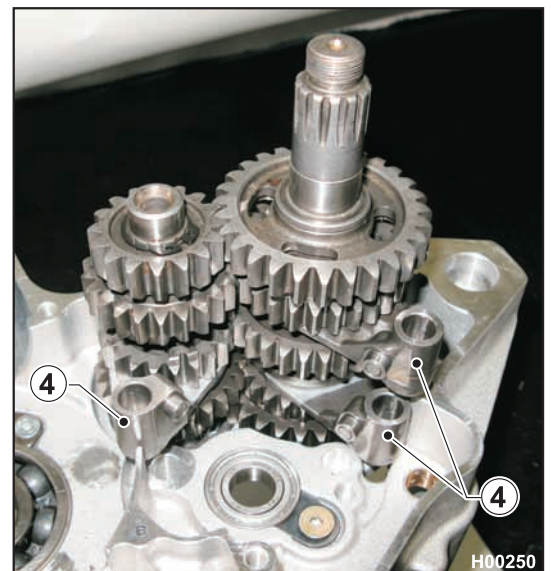
ENGINE REASSEMBLY



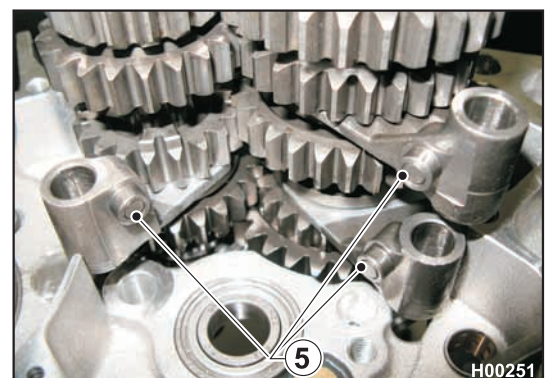
Install the input and output shaft assembly making sure the output shaft (3) shim is in place.

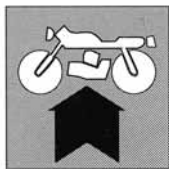


Lubricate the three shifter forks (4) with engine oil and install them.

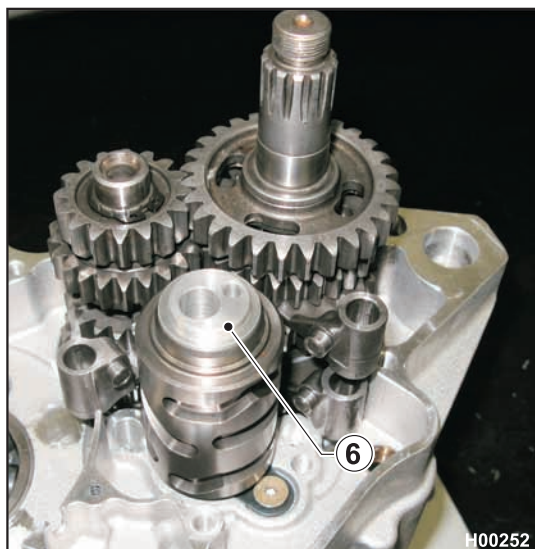


Make sure the bushings (5) are correctly in place (grease the bushings).

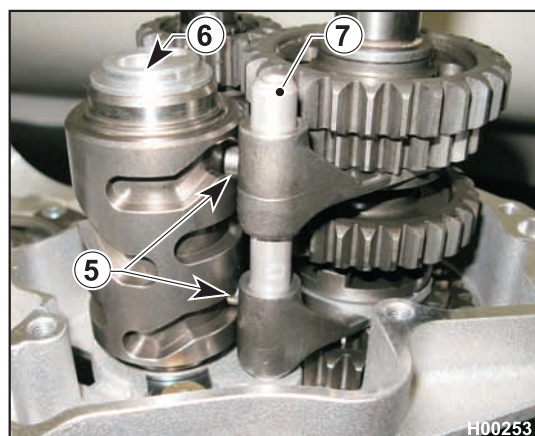




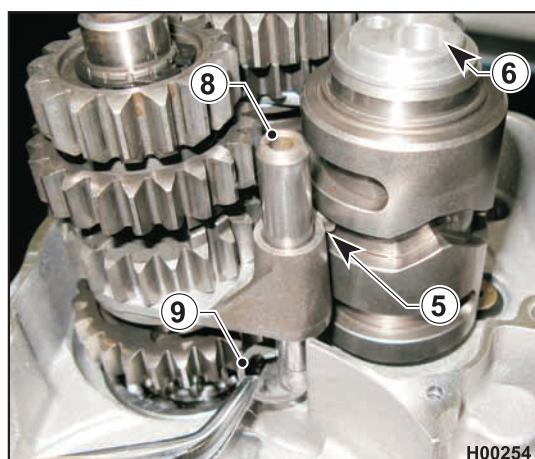
ENGINE REASSEMBLY

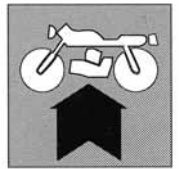


Insert the selector drum (6) into its seat.

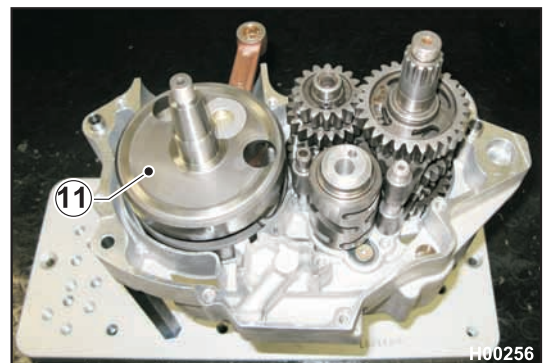
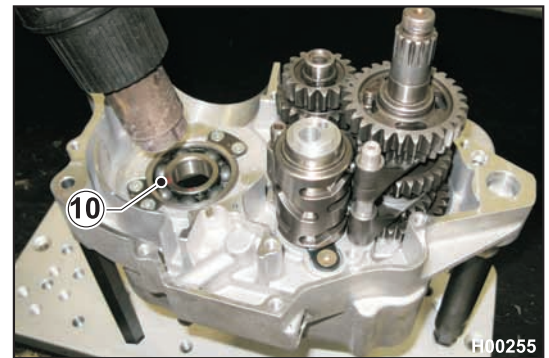


Install the fork shafts (7) and (8) and make sure the forks move freely. Make sure the fork bushings (5) are correctly located in the drum grooves (6). Insert the circlip (9) of the input shaft fork shaft. Rotate the selector drum to test operation.

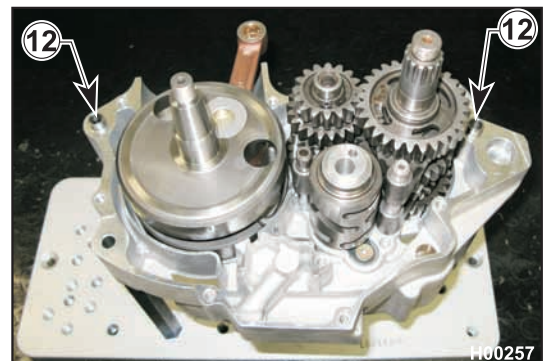




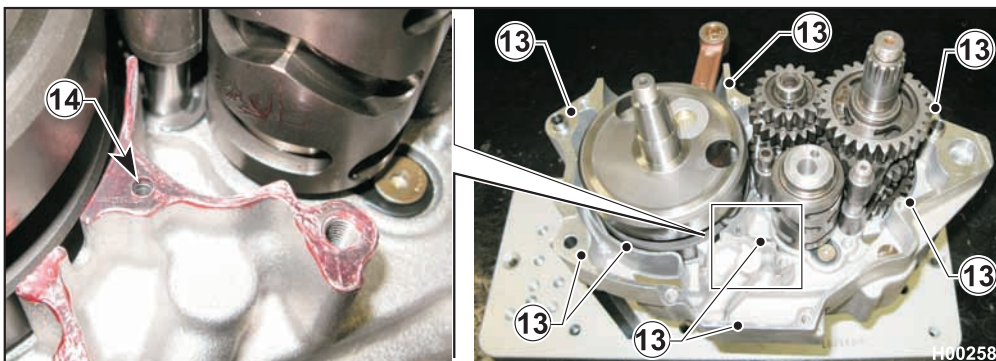
Heat up the crankshaft bearing (10) and install the crankshaft (11).

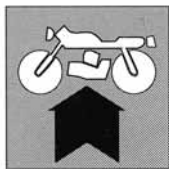


Make sure both crankcase locating bushings (12) are in place.



Apply a layer of "LOCTITE 5205" on the right crankcase mating surface (13), making sure not to obstruct the oil passage hole (14).

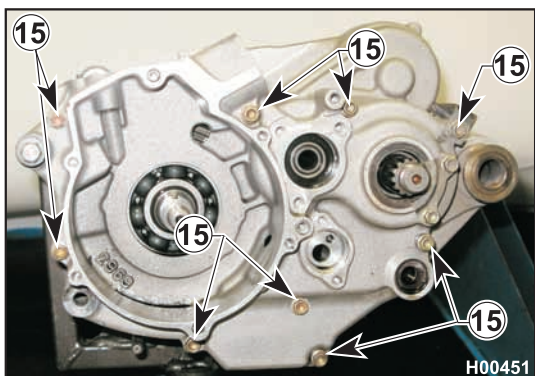




ENGINE REASSEMBLY



Heat up the left crankcase bearing housings and install the crankcase.

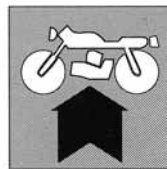


To join the crankcase halves, tap with a plastic hammer. Tighten the screws (15) using an 8 mm wrench (10 Nm, 1Kgm, 7.25 ft/lb). Make sure to fit the screws in the correct positions according the specified pattern (see Section F, paragraph "Crankcase disassembly").



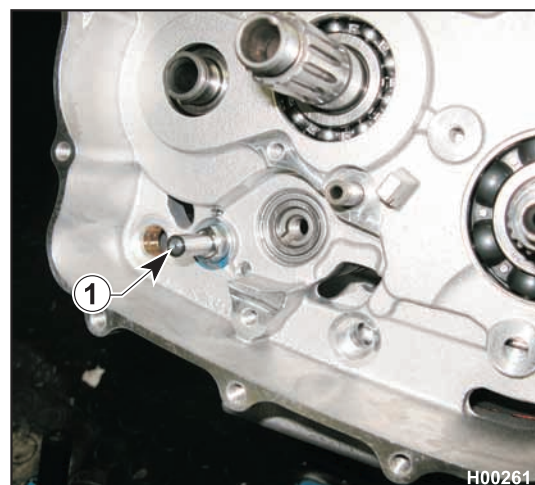
Cover the upper section of the engine with a cloth, a sponge or the like to prevent screws or other parts from accidentally falling into the engine.



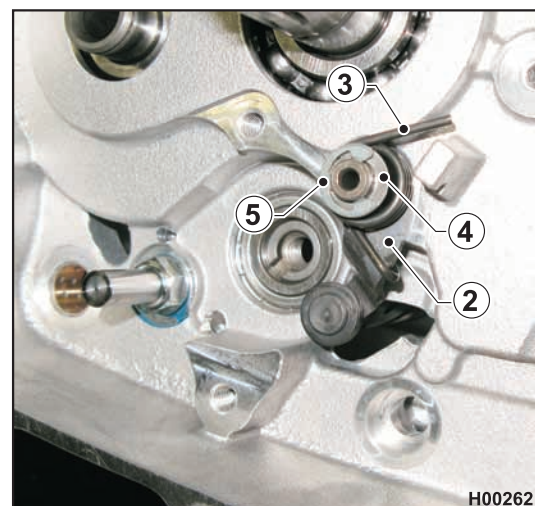


Gear shift control assembly

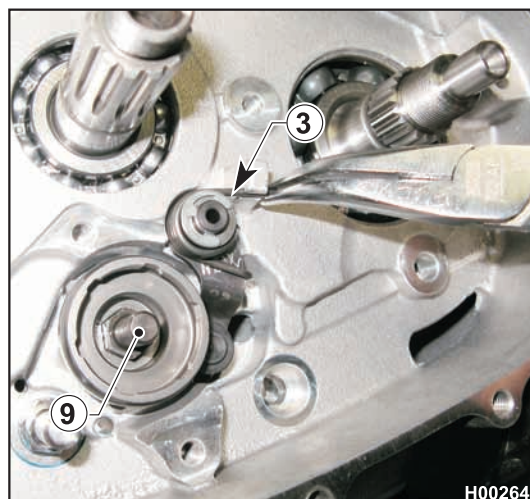
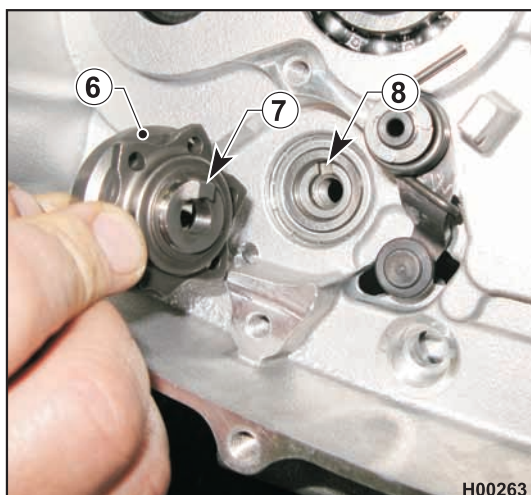
Refit the spring abutment pin (1) using a 12 mm wrench (apply Loctite 243 and tighten to 20 Nm, 2.0 Kgm, 14.5 ft/lb).

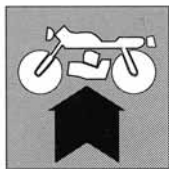


Install ratchet (2), spring (3), washer (4) and circlip (5).

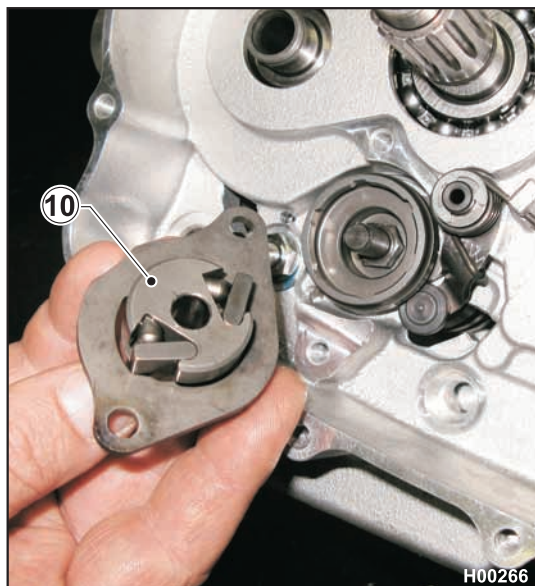


Install the selector drum (6) making sure the tab (7) locates in the recess (8) and secure drum with its screw (9). (Apply Loctite 243, tighten to 20 Nm, 2.0 Kgm, 14.5 ft/lb, use 12 mm wrench). Engage the spring (3).

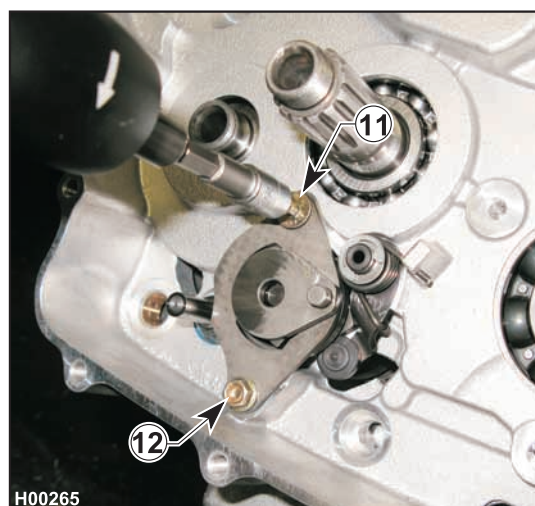




ENGINE REASSEMBLY

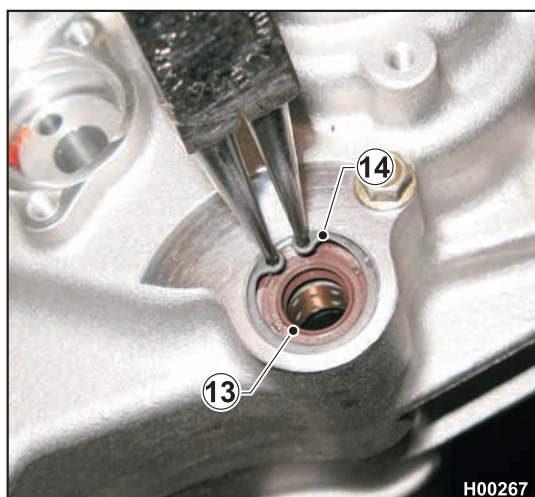


Operate shifter and transmission shaft to test gearbox for proper operation. Refit the ratchet assembly (10) together with the plate, making sure ratchets and springs are in the correct positions.



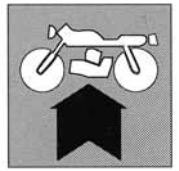
Tighten the upper screw (11) using a 4 mm Allen wrench (Loctite 243, 10 Nm, 1.0 Kgm, 7.2 ft/lb).

Tighten the lower screw (12) using an 8 mm wrench (Loctite 243, 10 Nm, 1.0 Kgm, 7.2 ft/lb).

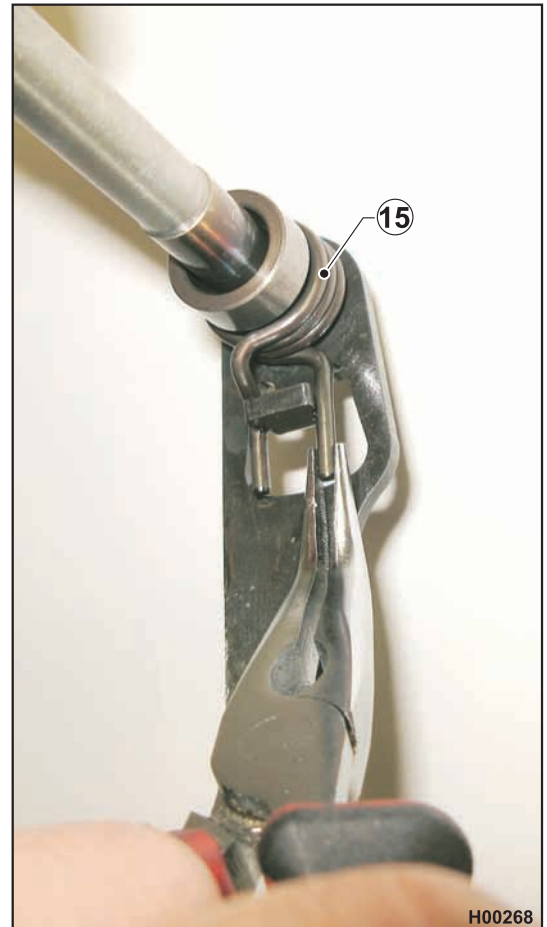


Turn the engine over and install the gear shift lever oil seal (13) and its circlip (14).

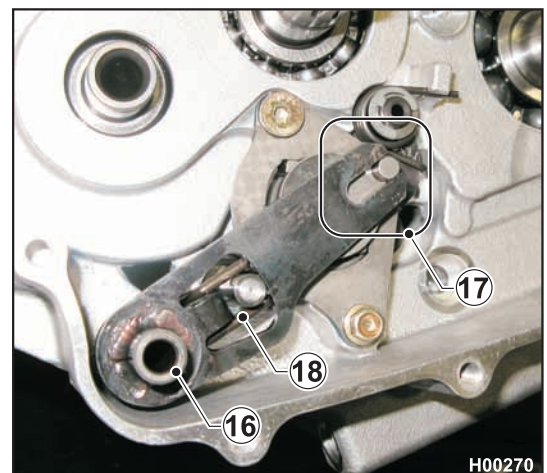


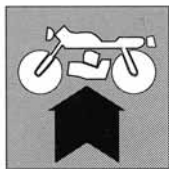


Turn the engine over.
Make sure the spring (15) of the gear shift lever shaft is positioned correctly.

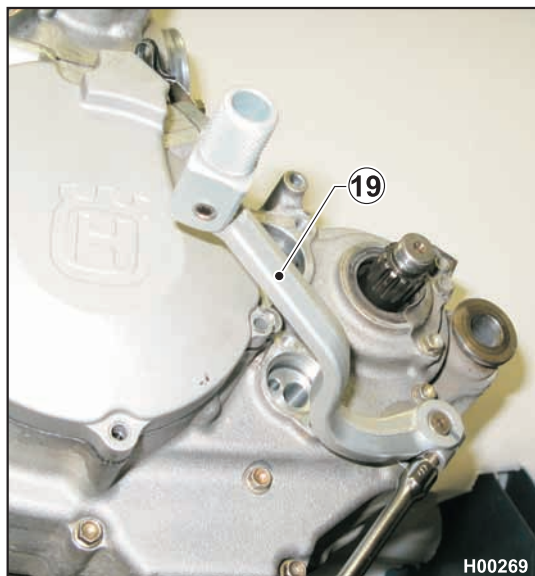


Check the gear shift lever shaft (16) and the slot of the gear selector mechanism for signs of wear.
Lubricate the shaft with engine oil and insert the shaft (16) into the crankcase so that the fork (17) slides over the ratchet detent and the spring (18) locates to its abutment pin.



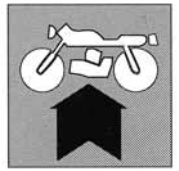


ENGINE REASSEMBLY



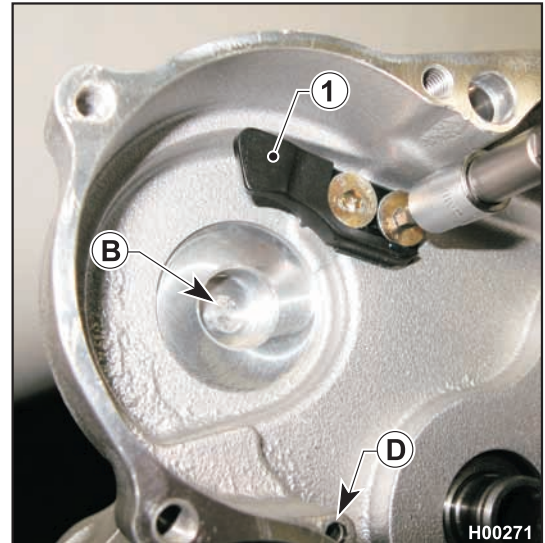
Install the gear shift lever (19) and operate the gearbox manually (8 mm wrench, 8 Nm, 0.8 Kgm, 5.8 ft/lb).



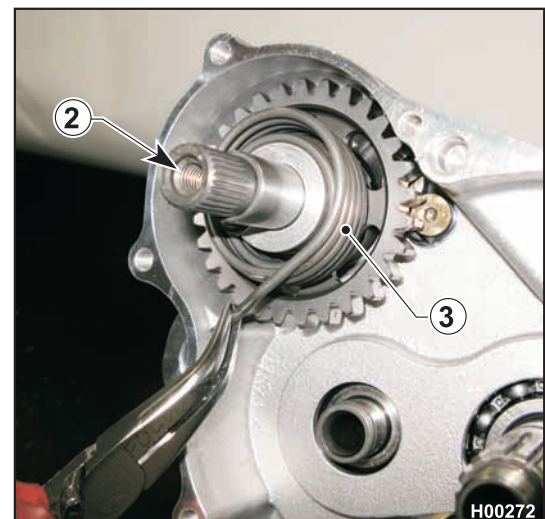


Kick start assembly

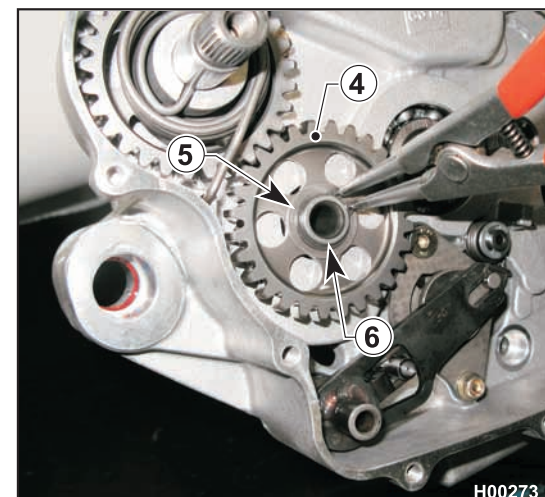
Refit the starter ratchet release plate (1) (use a 4 mm wrench, 8 Nm, 0.8 Kgm, 5.8 ft/lb, Loctite 243).

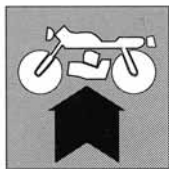


Fit the complete shaft assembly (2) to its seat (B) in the crankcase, making sure the ratchet is correctly positioned on the shaft (marks lined up) and insert the spring end (3) into the hole (D).

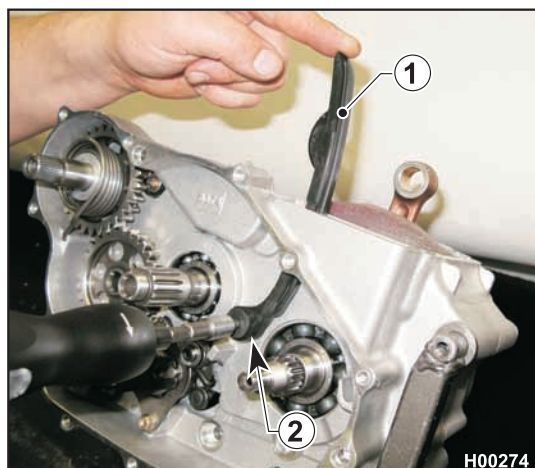


Fit transmission gear (4), washer (5) and snap ring (6).



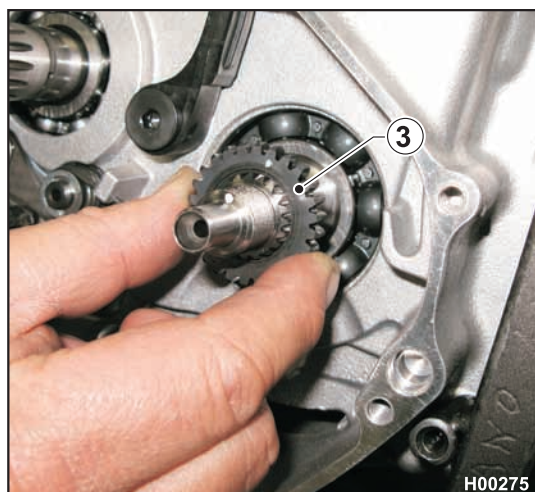


ENGINE REASSEMBLY

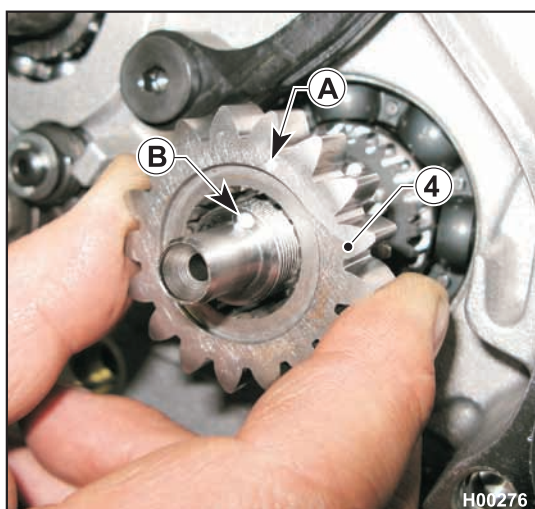


Timing chain and primary drive assembly

Install the timing chain slider (1), tighten the screw (2) using a 5 mm wrench (10 Nm, 0.1 Kgm, 7.3 ft/lb, Loctite 243) and make sure the slider moves freely.

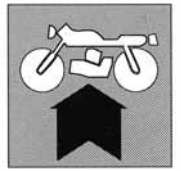


Fit the oil pump drive gear (3) making sure the side with the dot is facing outside.

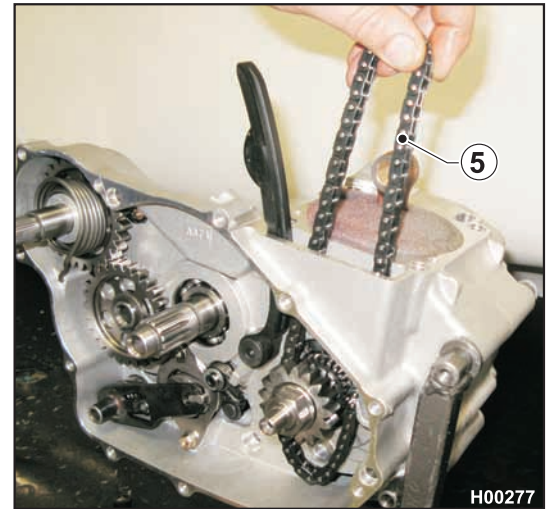


Fit the primary drive double gear (4) making sure to line up the timing dot (A) with the shaft dot (B).

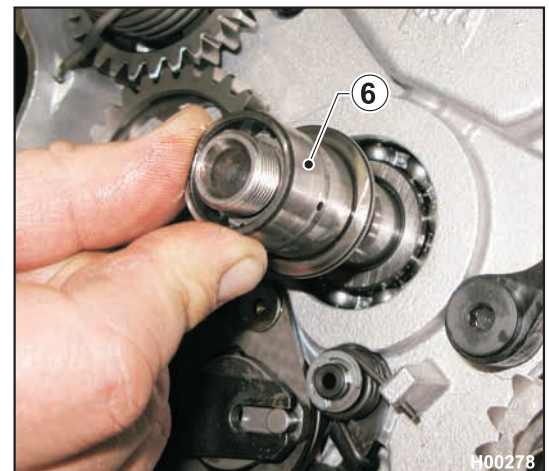




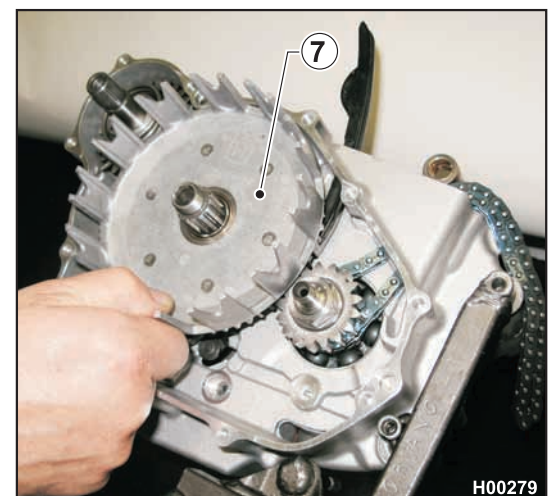
Install the timing chain (5).

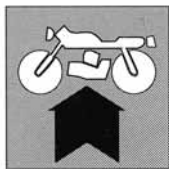


Refit the bushing (6).

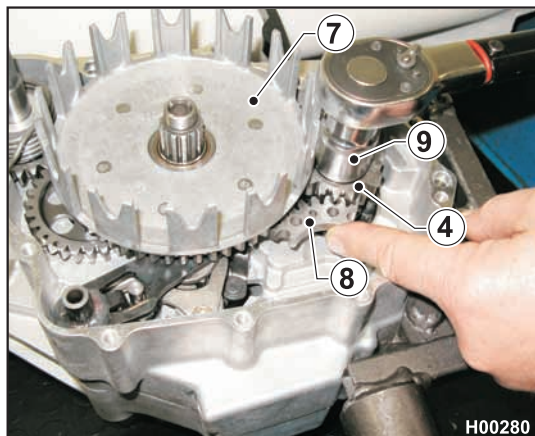


Refit the clutch housing (7).

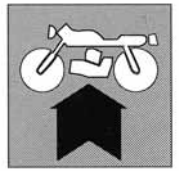




ENGINE REASSEMBLY



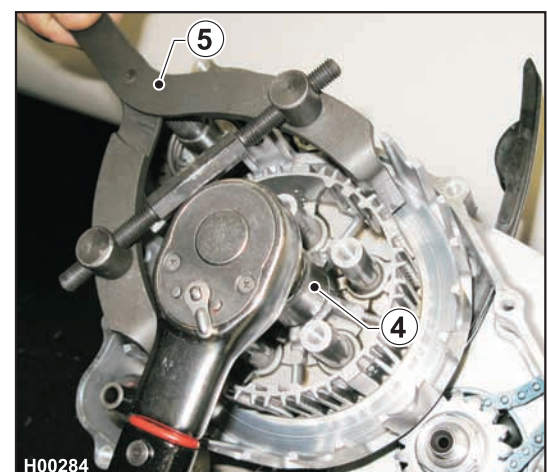
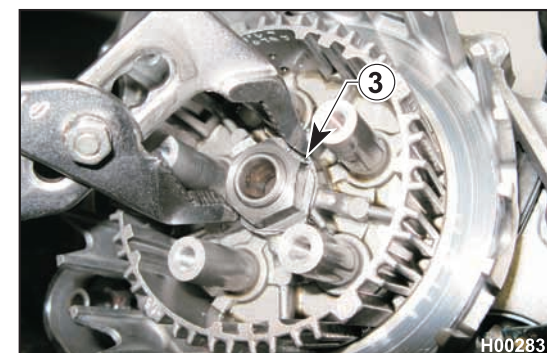
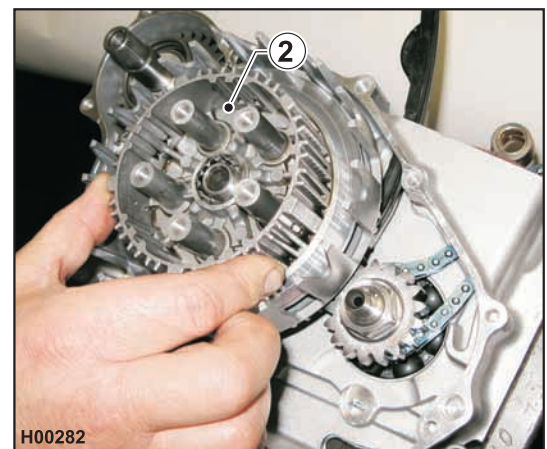
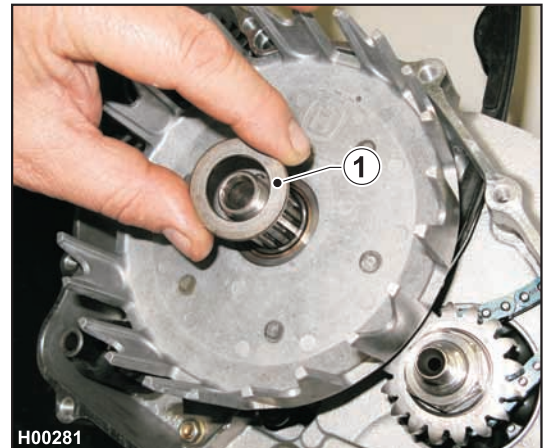
Place a dummy gear (8) or an aluminium shim between clutch housing (7) gear and double gear (4), and then tighten the primary drive shaft nut (9) (use a 22 mm wrench, 100 Nm, 10 Kgm, 72.50 ft/lb).

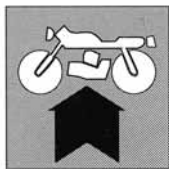


Clutch assembly

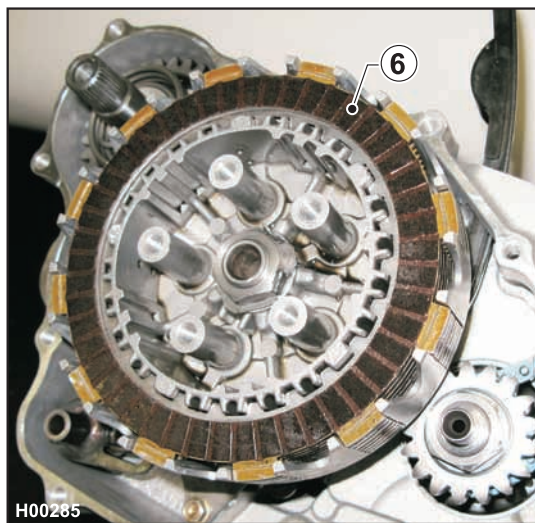
Install washer (1), hub (2), lock washer (3) and nut (4).

Use the suitable tool (5) to prevent rotation and tighten to 60 Nm, 6 Kgm, 43.5 ft/lb (use a 22 mm wrench).





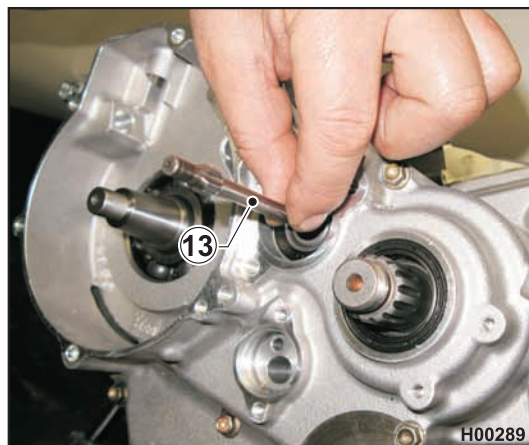
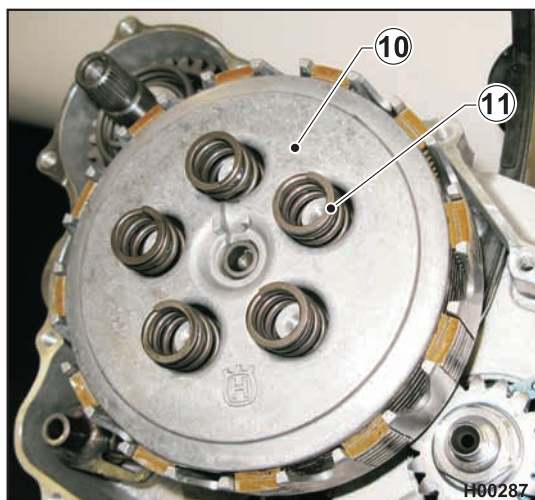
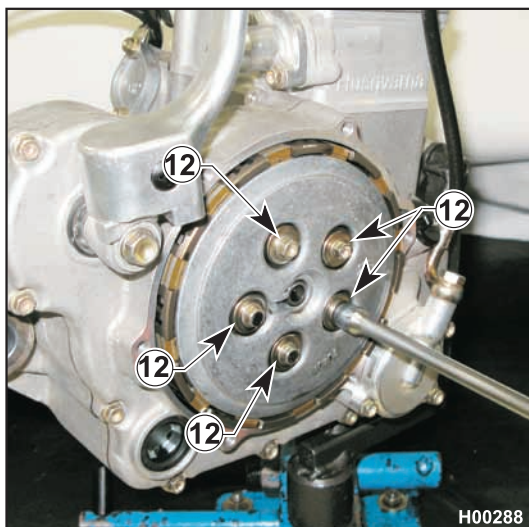
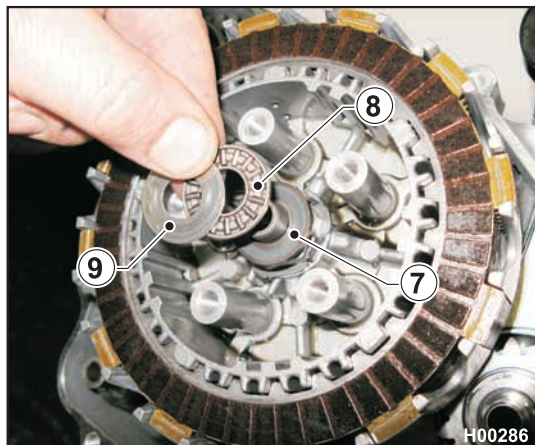
ENGINE REASSEMBLY

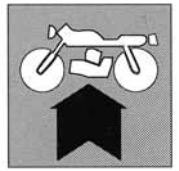


Refit the plates (6) (install a friction plate first and then a steel plate and keep alternating between friction and steel plates; the last to go in should be a steel plate). Fit actuator plate (7), thrust bearing (8), thrust washer (9), pressure plate (10) and springs (11). Tighten the spring screws (12) gradually in a cross pattern (5 Nm, 0.5 Kgm, 3.6 ft/lb).

Turn the engine over.

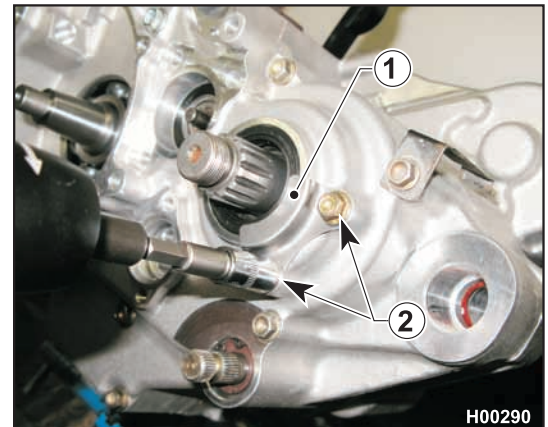
Install the clutch pushrod (13).



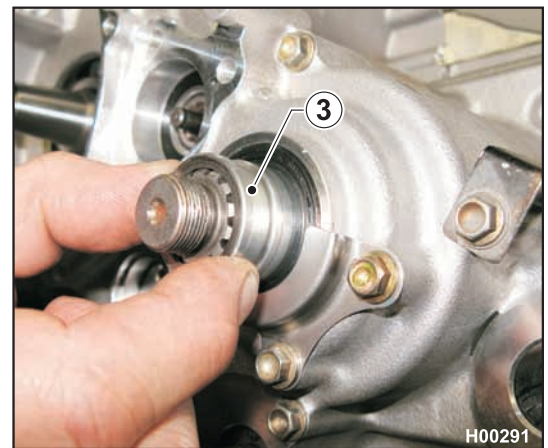


Sprocket installation

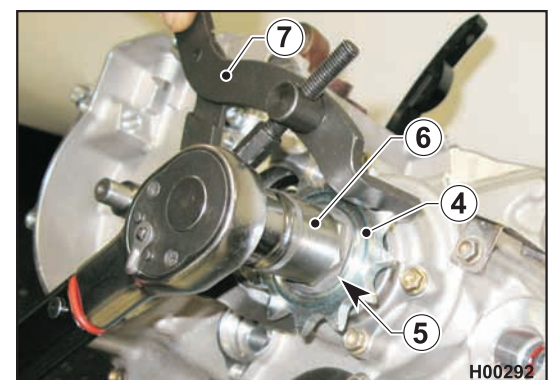
Install the oil seal retaining plate (1) and tighten the screws (2) (use an 8 mm wrench , 5.5 Nm, 0.55 Kgm, 4 ft/lb).

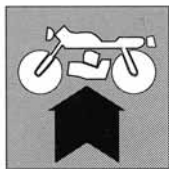


Fit the spacer (3) with the grooved side facing inwards.

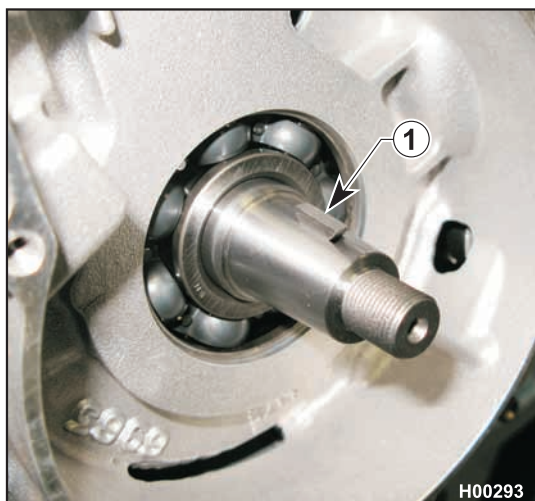


Install sprocket (4), lock washer (5) and nut (6). Hold the sprocket (4) with the suitable tool (7) to prevent rotation and tighten the nut (6) (use a 22 mm wrench, 100 Nm, 10 Kgm, 72.5 ft/lb). Bend the tabs of the lock washer.



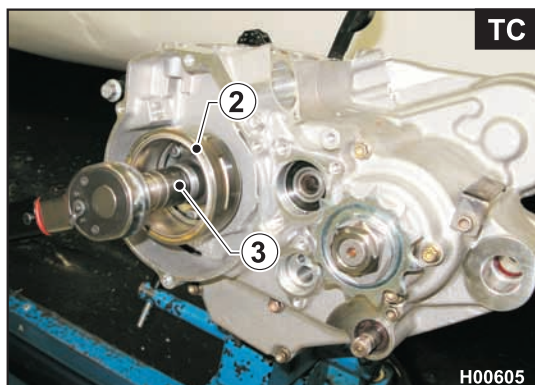


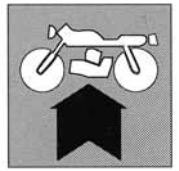
ENGINE REASSEMBLY



Flywheel installation (TC)

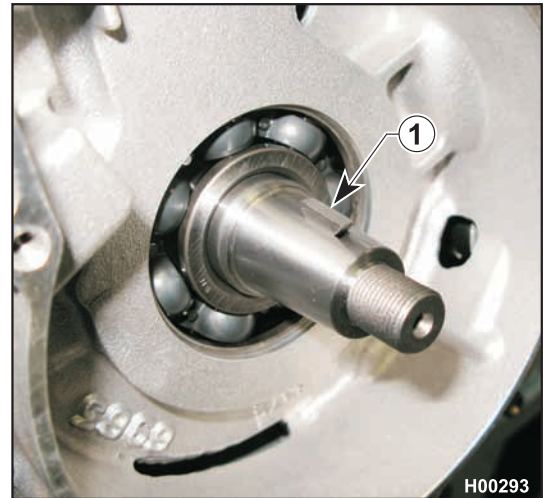
Clean flywheel rotor to remove any debris suspended in swirling oil and captured by the magnets. Fit the tab (1) into the crankshaft and refit the rotor (2). Hold the rotor (2) to prevent rotation and place an aluminium shim or dummy gear between the primary drives gears on the right side, again to prevent rotation. Tighten the nut (3) to 75 Nm, 7.5 Kgm, 54.3 ft/lb. Use a 17 mm wrench.



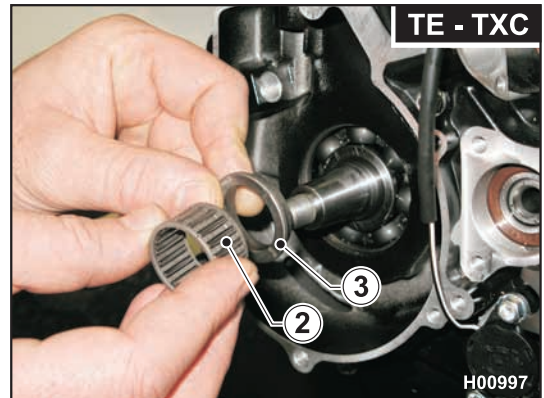


Flywheel and starter motor installation (TE - TXC)

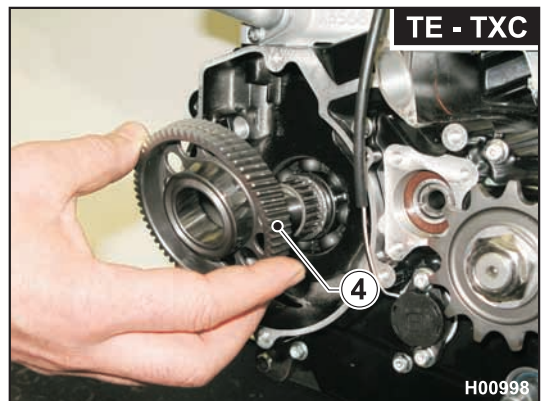
Clean flywheel rotor to remove any debris suspended in swirling oil and captured by the magnets. Fit the tab (1) to the crankshaft.

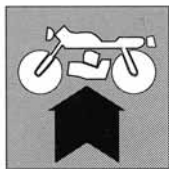


Lubricate needle roller bearing (2) and thrust ring (3) with engine oil and install them, making sure the thrust ring slots are pointing outwards.

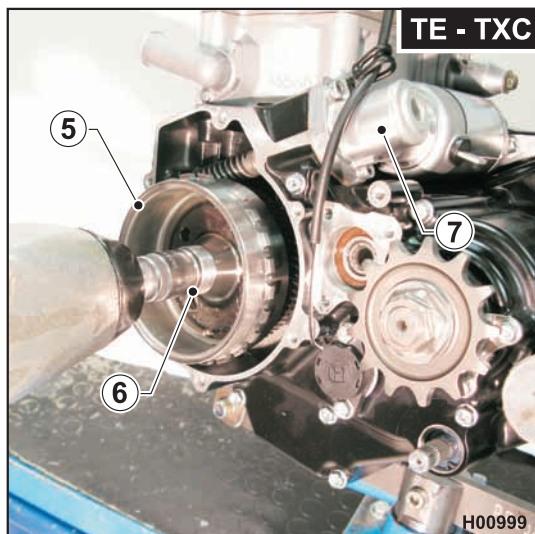


Lubricate the freewheel (4) with engine oil and refit it.





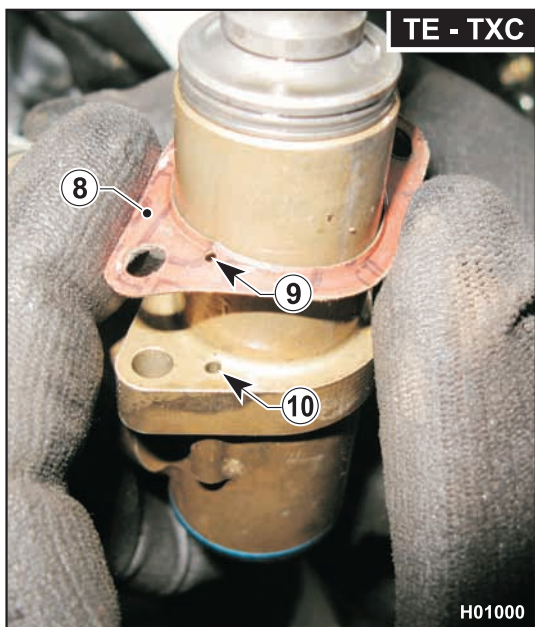
ENGINE REASSEMBLY



Flywheel installation (TC)

Refit the rotor (5). Hold the rotor (5) to prevent rotation and place an aluminium shim or dummy gear between the primary drives gears on the right side, again to prevent rotation. Tighten the nut (6) to 75 Nm, 7.5 Kgm, 54.3 ft/lb. Use a 17 mm wrench.

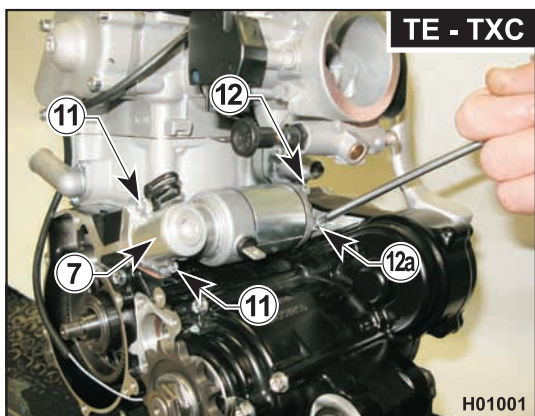
Before installing the starter motor (7), check for free (clockwise) rotation of the freewheel (4) while holding the rotor (5) steady.



Assemble the starter motor (7).



WARNING: On assembly, check the gasket (8) for damage and replace it if needed. Make sure to position it correctly with the gasket hole (9) matching the hole (10) in the starter motor flange.



Fit the starter motor (7) into place.

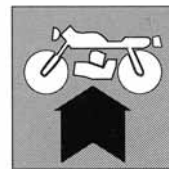
Tighten the bevel drive screws (11) using a 4 mm Allen wrench (6 Nm - 0.6Kgm - 4.43 ft/lb).

Tighten the screws (12) (12a) using a 4 mm Allen wrench (6 Nm - 0.6Kgm - 4.43 ft/lb).

12=L= 25 mm

12a=L=30 mm



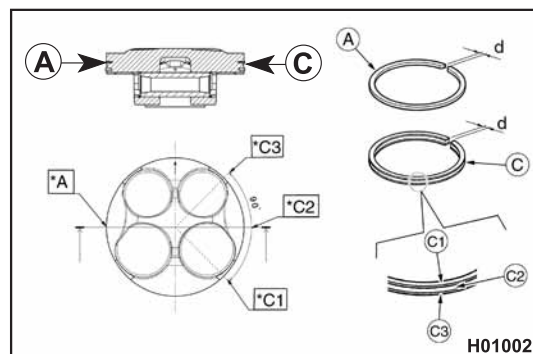


Piston ring installation

Fit the piston rings as shown in the diagram. If the piston ring is marked on one side, that side must be facing up.

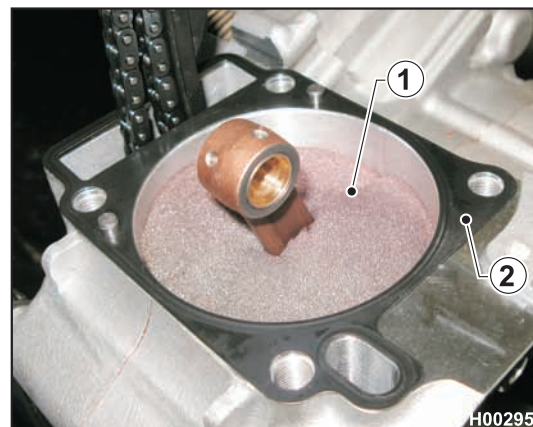
A= Compression ring
C= Oil control ring

*C1= Top oil rail end gap position
*C1= Oil rail spacer end gap position
*C1= Bottom oil rail end gap position



Piston and cylinder installation

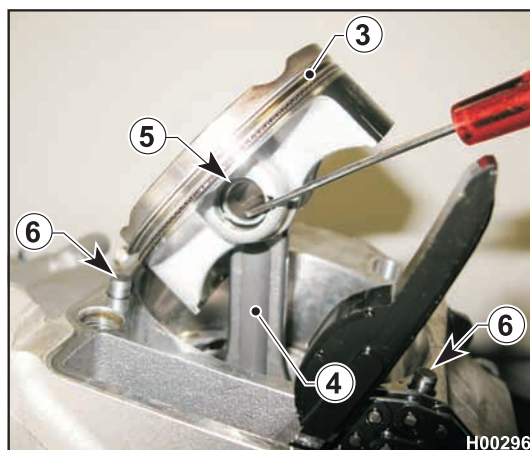
Remove the rubber protection (1).
Install a new cylinder foot gasket (2).

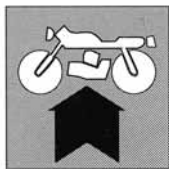


Assemble piston (3) to connecting rod (4) (lubricate with engine oil) and fit the piston pin retaining rings (5).

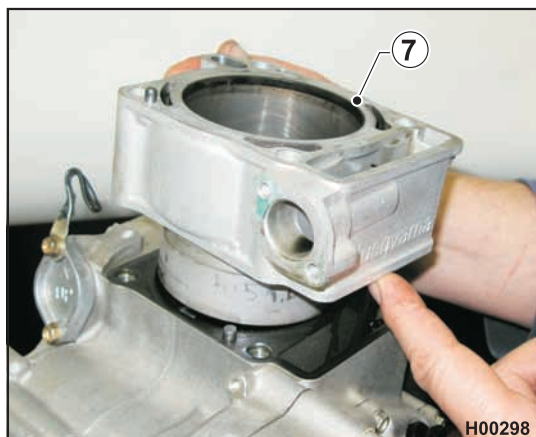
Make sure the arrow mark on the piston is pointing to the front end.

Make sure that the locating pins (6) are in place.

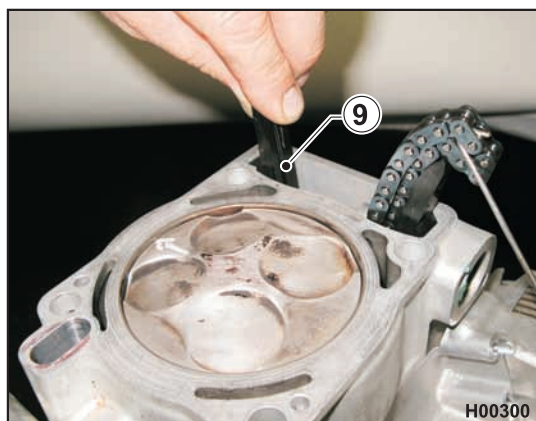
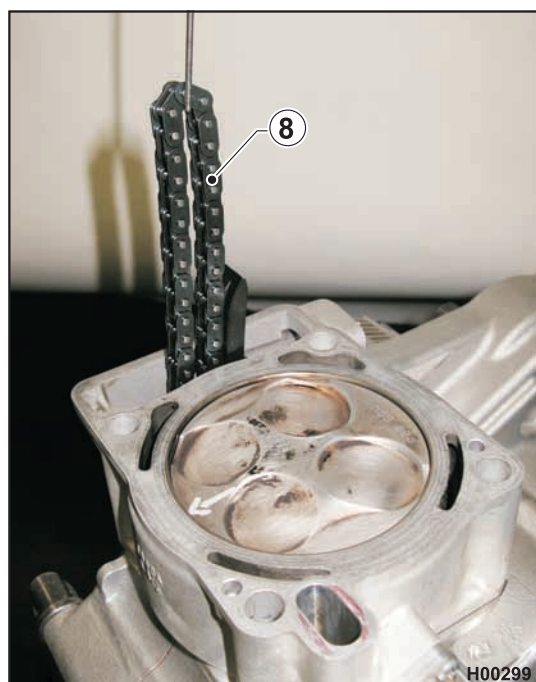




ENGINE REASSEMBLY

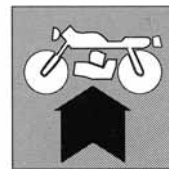


Lubricate the cylinder liner (7) with engine oil and slide it over the piston rings. Make sure to collect the timing chain (8).



Position the slider (9).

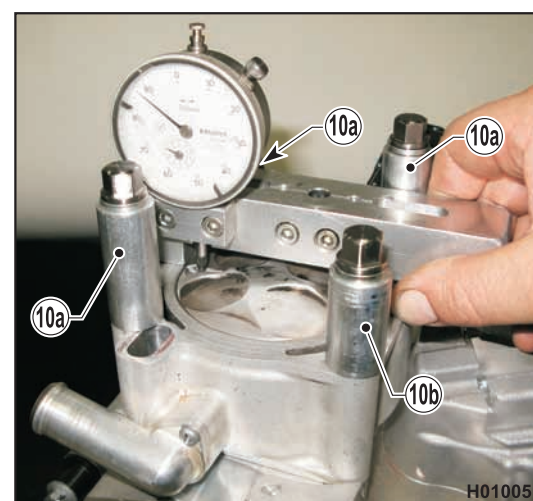
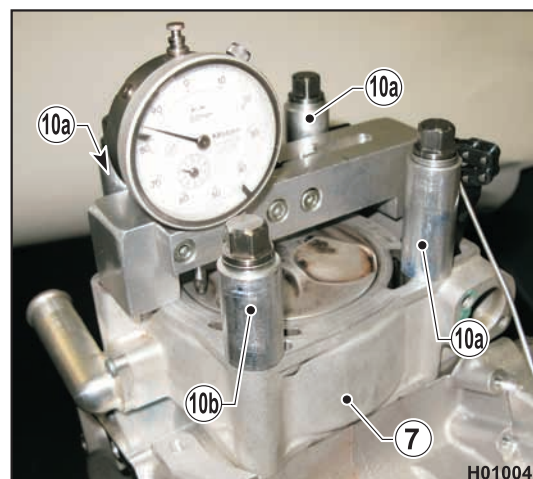
ENGINE REASSEMBLY



Fit screws and spacers (10) to temporarily secure the cylinder liner (7).
(3 spacers 10a, h= 44.2 mm; 1 spacer 10b, h= 29.2 mm)
Use a 12 mm wrench - 40 Nm, 4 Kgm, 29 ft/lb.
Make sure that the piston is at Top Dead Centre.

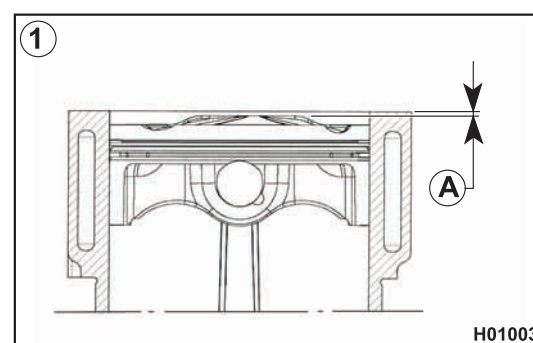
Measure distance "A" on the four machined faces of the piston and choose the appropriate head gasket according to the table below.

Remove spacers and screws (10) and fit the appropriate head gasket.



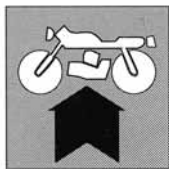
Cylinder head gasket selection table

Bring piston to T.D.C. at the end of the compression stroke, measure distance "A" between piston crown and head gasket mating face and select the appropriate gasket according to the table below.

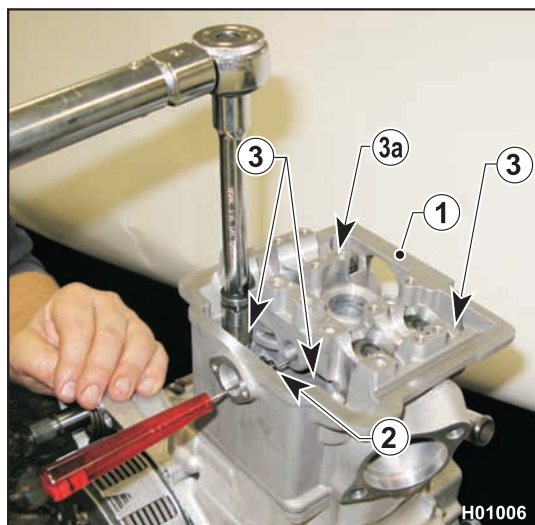


CONDITION (see diagram)	"A"	Gasket thickness	Gasket part no.
1) (piston lower than cylinder mating face)	-0.1 ± 0.05 mm	0.7 mm	8B00 A6576
1) (piston lower than cylinder mating face)	-0.2 ± 0.05 mm	0.6 mm	8A00 A6576
1) (piston lower than cylinder mating face)	-0.3 ± 0.05 mm	0.5 mm	8000 A6576





ENGINE REASSEMBLY



Cylinder head installation

For valve installation instructions, please see Section "G".

Always use a new head gasket on assembly: see the "Cylinder head gasket selection table".

Install the head (1) while supporting the timing chain (2) with a screwdriver.

Tighten the head bolts (3) gradually in a cross pattern to 40 Nm, 4 Kgm, 29 ft/lb (use a 12 mm wrench).

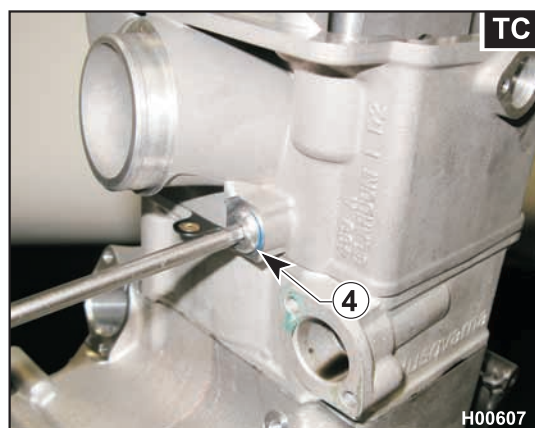


WARNING

Refit each of the bolts (3) and (3a) in its original position.

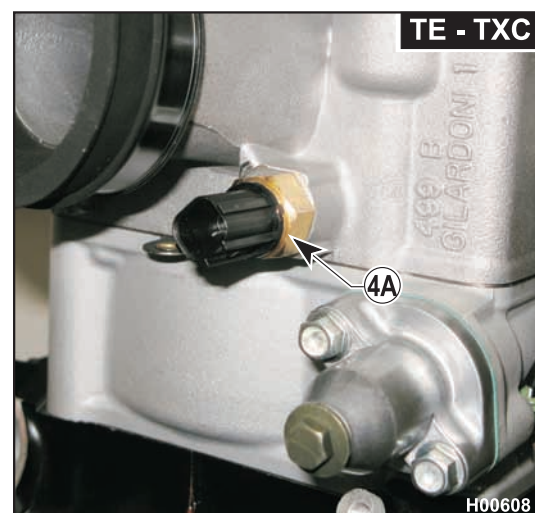
Bolt 3 = 119.5 mm long

Bolt 3a = 104.5 mm long



TC

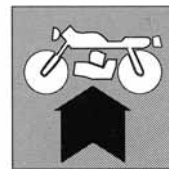
Refit the cap (4) with its gasket (use a 5 mm Allen wrench, Loctite 243, 20 Nm, 2.0 Kgm, 14.5 ft/lb).



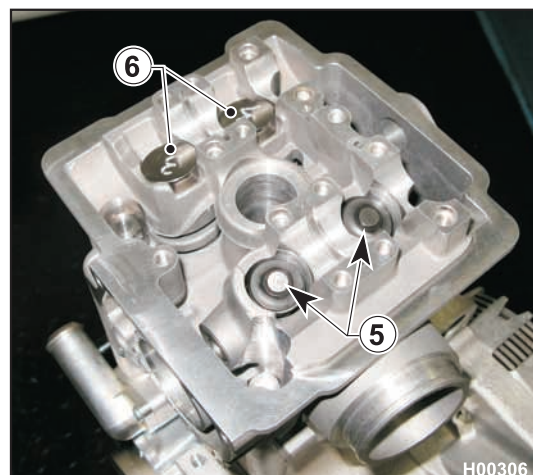
TE - TXC

Refit the water temperature sensor (4A) (use a 17 mm ring wrench 5 Nm, 0.5 Kgm, 3.69 ft/lb).





Refit the four shim (5) on the valves and the valve buckets (6) as marked on removal.

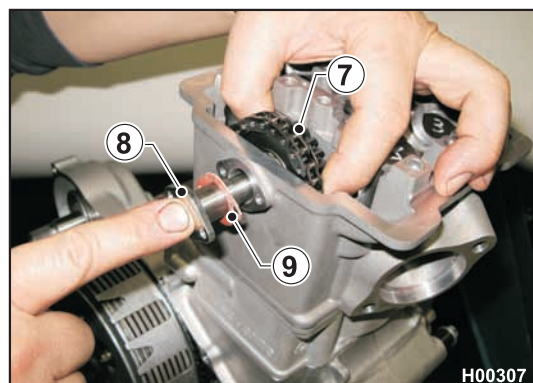


Check the bearings of the timing drive upper gear (7) and replace them if needed.



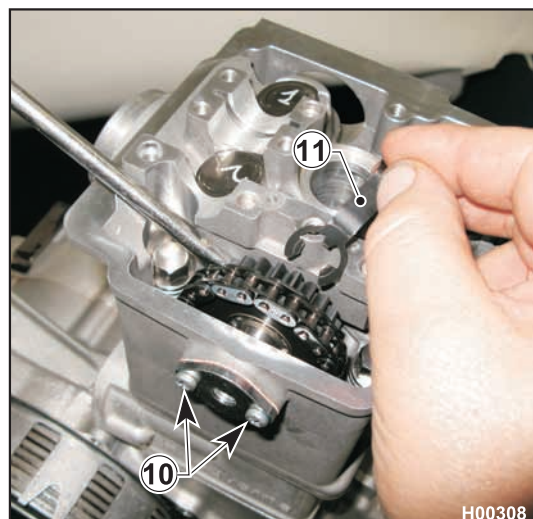
The gear (7) requires no timing.

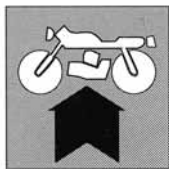
Refit the gear (7) with its shaft (8) and gasket (9).



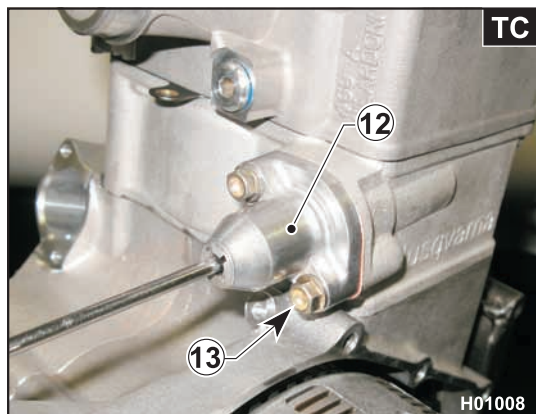
Tighten the screws (10) with a Phillips screwdriver (4 Nm, 0.4Kgm, 2.9 ft/lb, Loctite 243).

Push the gear until exposing the groove and fit the retaining ring (11).





ENGINE REASSEMBLY



Timing chain tensioner installation

Refit the chain tensioner (12) and its gasket. Tighten the two screws (13) using an 8 mm wrench (10, Nm, 1.0 Kgm, 7.25 ft/lb).



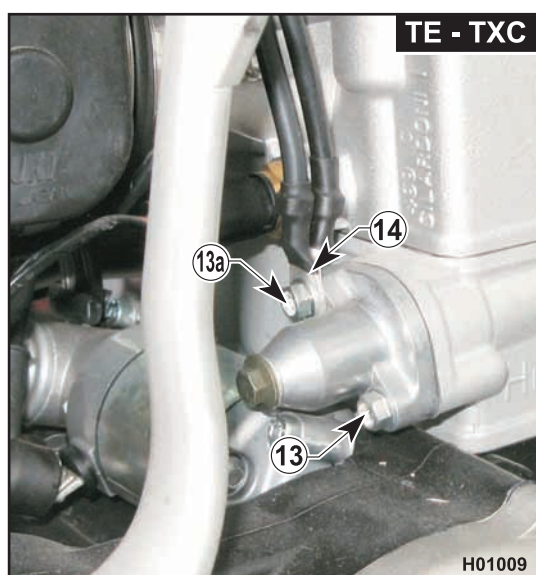
WARNING

On TE and TCX models, the two retaining screws feature two different lengths.

Screw 13A = L.25 mm

Screw 13 = L.20 mm

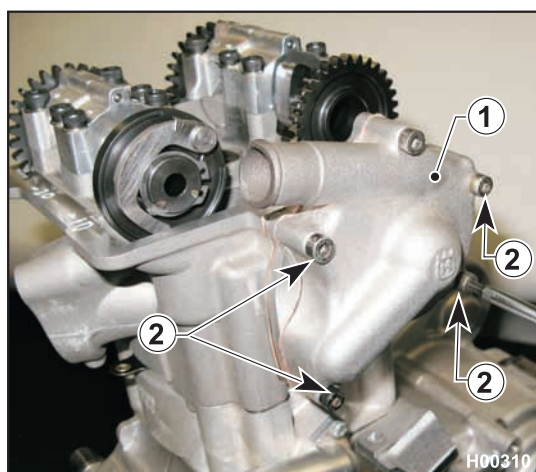
On assembly, position the screw (13a) at the uppermost position and fit the ground rings (14) before tightening.



IMPORTANT

Do not confuse the screws and do not tighten the screw (13a) unless you have fitted the ground rings; RISK OF CYLINDER FAILURE.

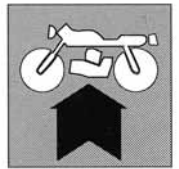
Release the chain tensioner (12) using a screwdriver (turn counter clockwise).



Water pump installation

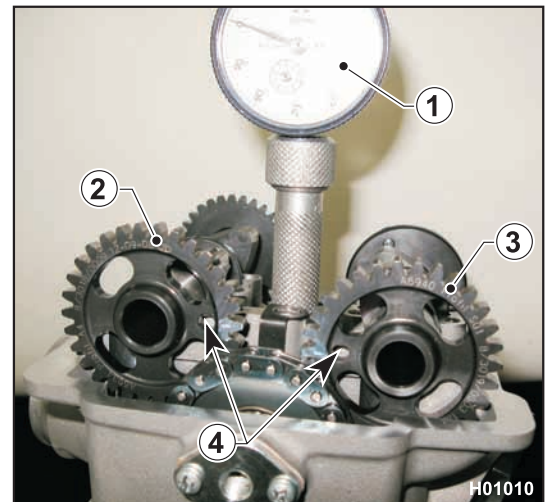
Refit the water pump (1) with its gasket. Avoid using excessive force to engage pump gear with intake camshaft gear. Tighten the screws (2) with a 4 mm Allen wrench (5.5 Nm, 0.5 Kgm, 3.98 ft/lb).



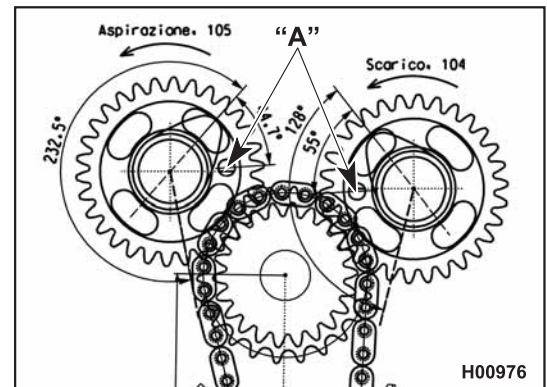


Camshaft installation

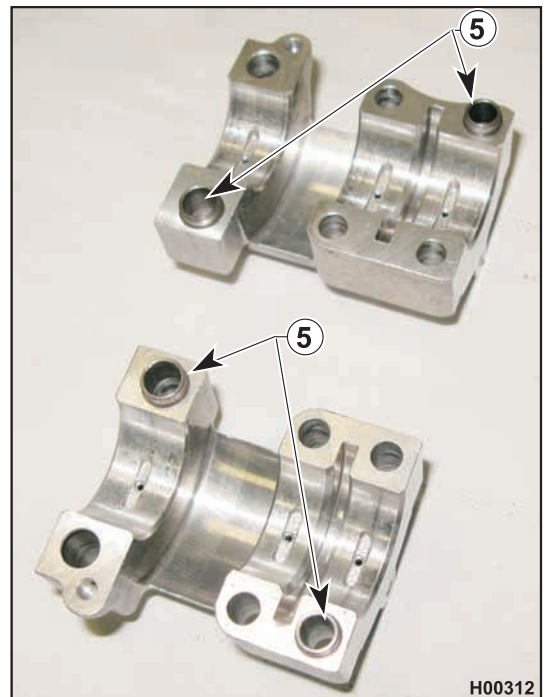
Secure a dial gauge (1) to the spark plug hole.
Turn the crankshaft manually until bringing the piston to Top Dead Centre.
Refit intake camshaft (2) and exhaust camshaft (3) with the gears positioned as shown in the figure.

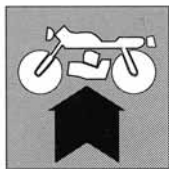


Cover parting line "A" is visible through the holes (4).

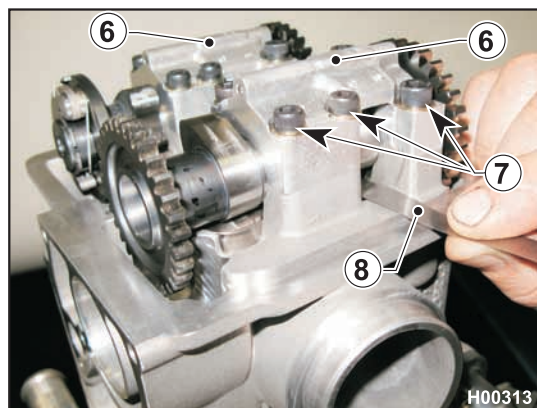


Make sure that the bushings (5) are in place in the covers.





ENGINE REASSEMBLY



Refit the camshaft covers (6) and tighten the screws (7) in a cross sequence and shown in diagram "B". Make sure to fit the screws in the correct position according to their length (see diagrams "A" and "B").

- 7a= M6x35 Allen screw
- 7b= M6x30 Allen screw
- 7c= M6x25 Allen screw
- 7d= M5x30 Allen screw

Turn the crankshaft manually a few turns to check for free, smooth rotation without any tight points, then bring it back to Top Dead Centre position.

Use a feeler gauge (8) to check clearance between valve buckets and cam lobes.

Correct values are as follows:

- intake: 15 hundredths
- exhaust: 20 hundredths.

If the value is outside the limit, remove the covers and replace the shims under the valve buckets with shims of the appropriate size so as to achieve correct clearance.

Replacement shims are available in a 1.60 mm to 2.60 mm thickness range, in 0.05 mm increments.

Thickness (S) of the new shim is determined as follows:

$$S = (G1 - G) + S1$$

S= Thickness of new shim

G1= Measured valve clearance

G= Specified valve clearance

S1= Thickness of old shim

On assembly, check the timing of the camshaft gears and measure valve clearance again.

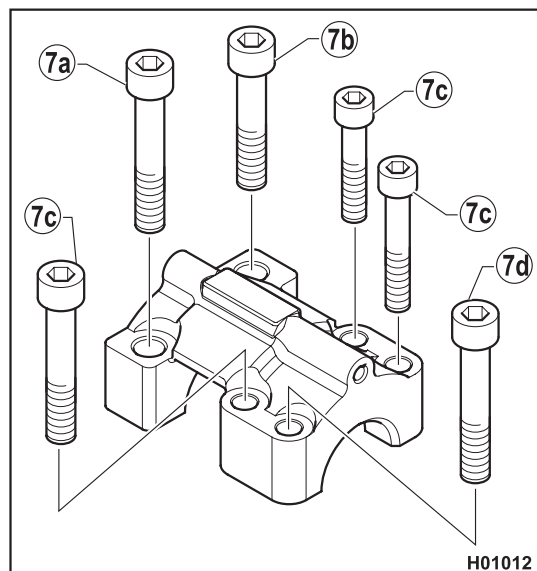


Diagram "A"

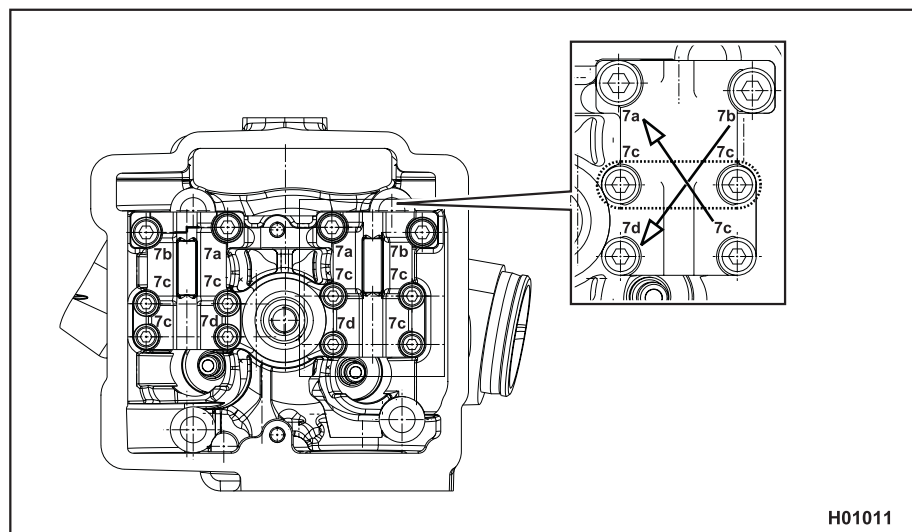
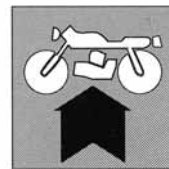


Diagram "B"





Flywheel cover installation

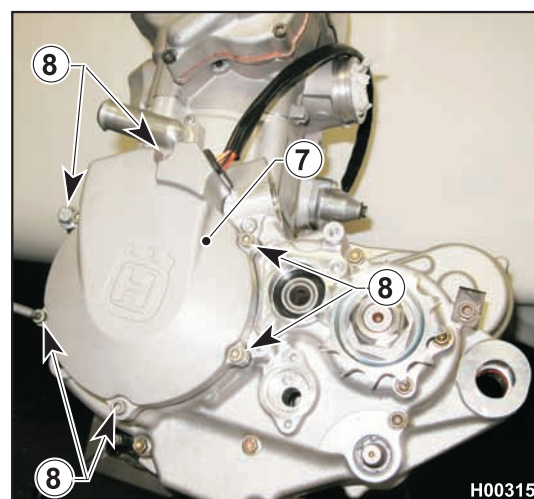
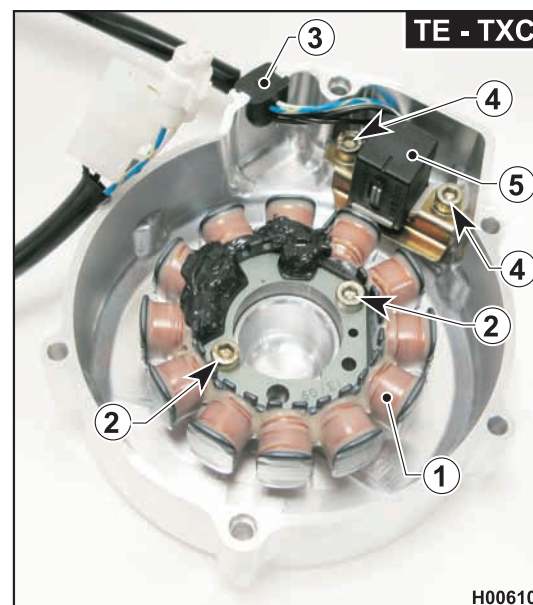
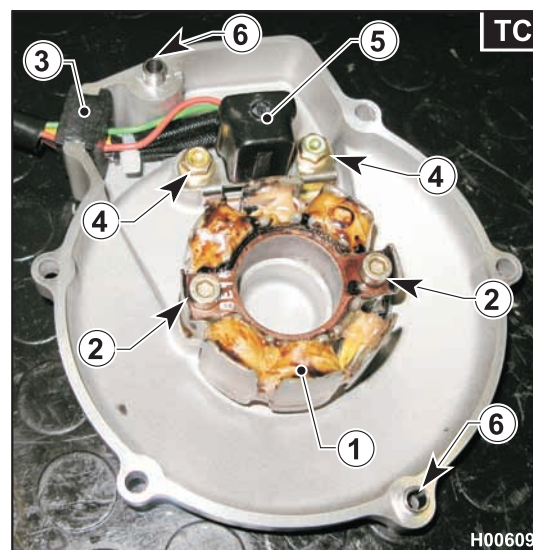
Install the stator (1) with its mark lined up with the flywheel cover mark and tighten the two retaining screws (2) (use a 4 mm Allen wrench, 6 Nm, 0.6 Kgm, 4.3 ft/lb + Loctite 272).

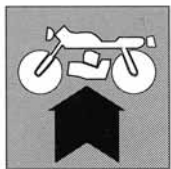
Insert the cable guide (3) into its seat in the cover and tighten the two retaining screws (4) of the pick-up sensor (5) with its plate (6 Nm, 0.6 Kgm, 4.3 ft/lb + Loctite 272).

Install the flywheel cover (7) with its gasket and tighten the six screws (8) to 6 Nm, 0.6 Kgm, 4.3 ft/lb.

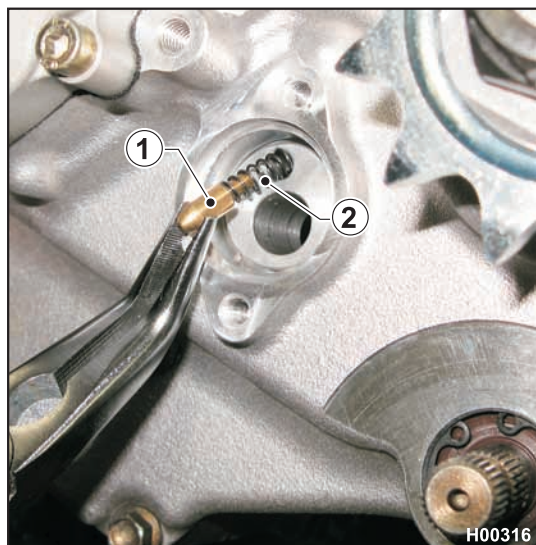


Make sure the two centring bushings (6) are in place.





ENGINE REASSEMBLY

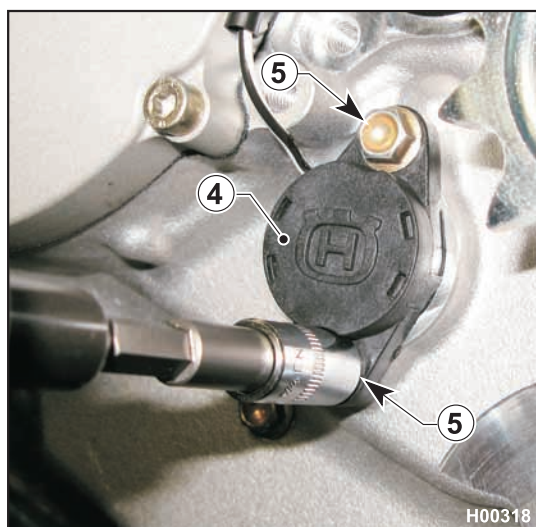
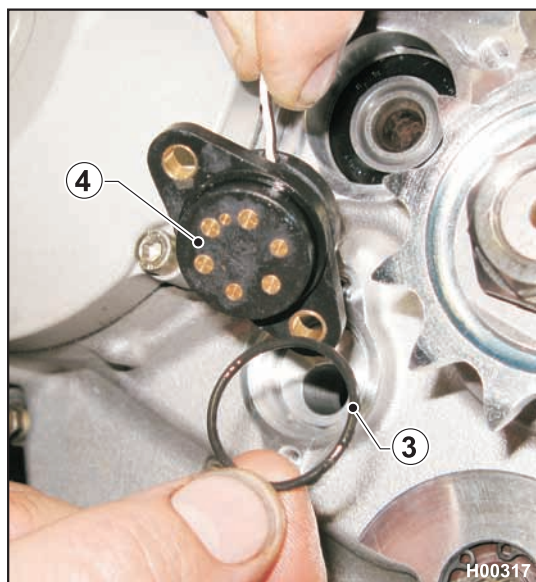


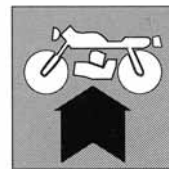
Neutral sensor installation

Refit pin (1) and spring (2).

Check the O-ring (3) of the sensor (4).

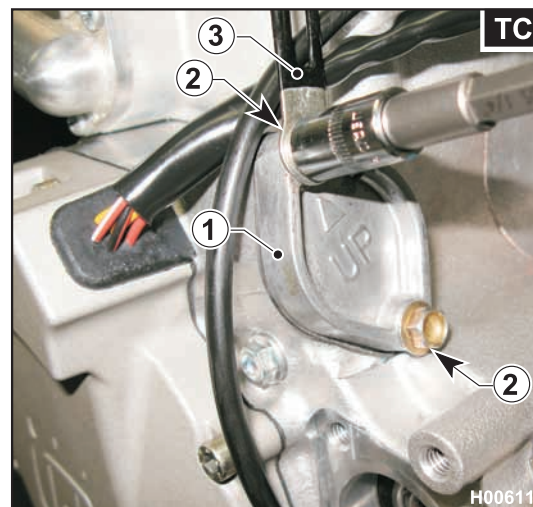
Refit the sensor (4) and tighten the screws (5) using an 8 mm wrench (5.5 Nm, 0.55 Kgm, 4 ft/lb, Loctite 243).





Starter motor seat cover installation (TC)

Refit the cover (1) with its gasket making sure the arrow is pointing "UP".
Tighten the screws (2) with the wire clip (3) placed on the upper screw.



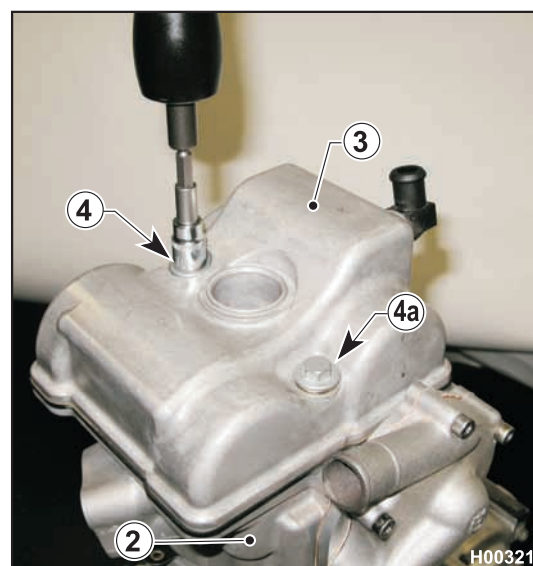
Cylinder head cover, spark plug, oil feed hose installation

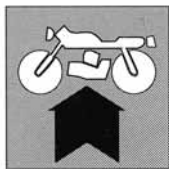
Position the central seal (1).



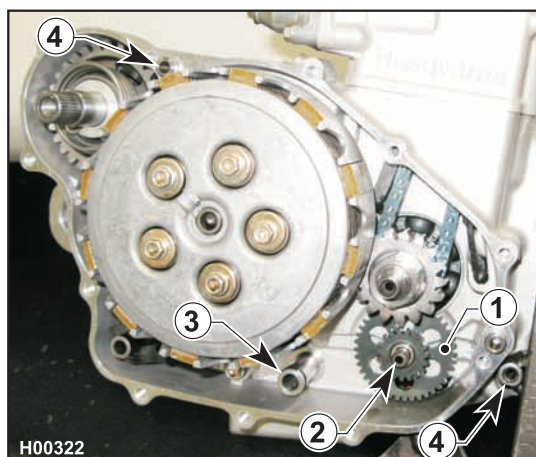
Fit the head cover (3) with its gasket to the head (2).
Tighten the screws (4) and (4a) (8 Nm, 0.8 Kgm, 5.9 ft/lb).
Screw 4 - L=23.4 mm
Screw 4a - L=31.3 mm

Install the spark plug (10-12 Nm, 1-1.23 Kgm, 7.2 -8.9 ft/lb).





ENGINE REASSEMBLY



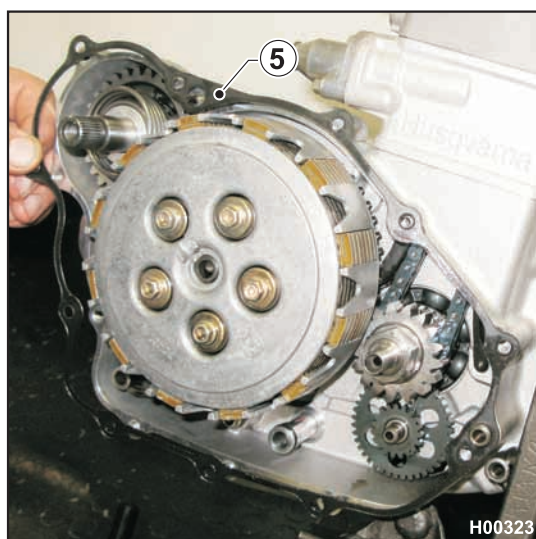
Right crankcase assembly

Refit the oil pump drive gear (1) and its shaft (2).

Check the O-rings of the oil suction stub (3) and replace them if needed.

Refit the oil suction stub (3).

Refit the centring bushings (4).

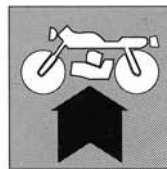


Refit the gasket (5).

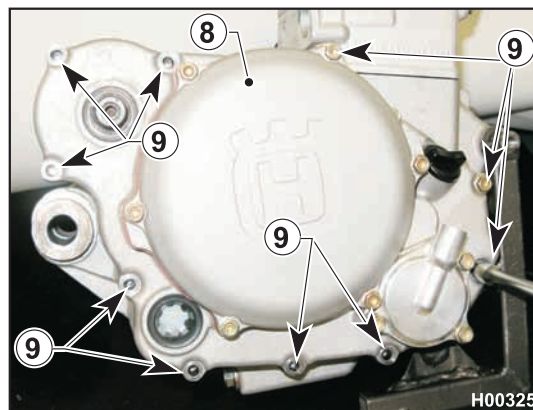


Manually check for correct installation and operation of the pump (6) and make sure the crankshaft sealing ring (7) is in the correct position.

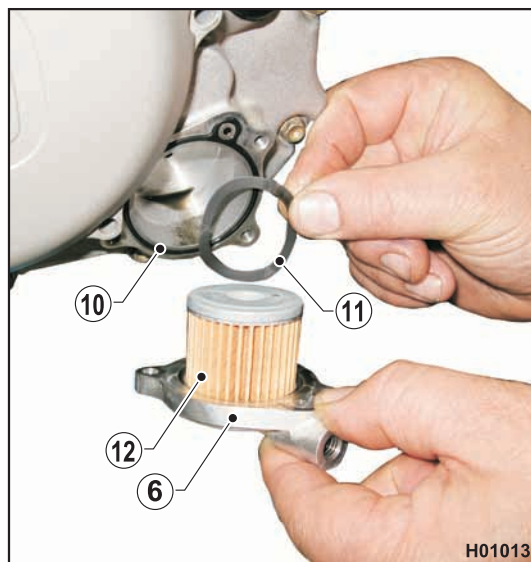
ENGINE REASSEMBLY



Install the crankcase (8) and tighten the screws (9) following a cross pattern (use an 8 mm wrench , 10 Nm, 1.0 Kgm, 7.25 ft/lb). Make sure pump gear and drive gear engage correctly.



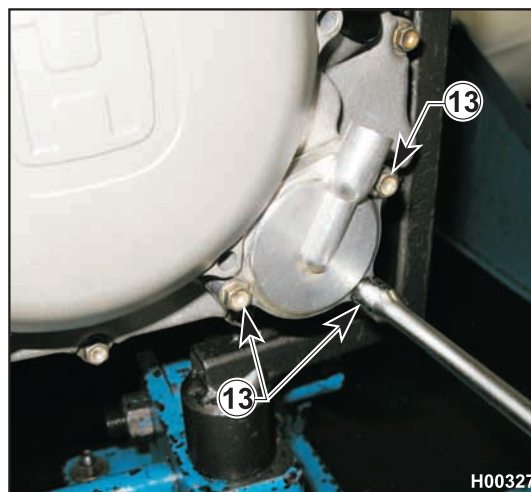
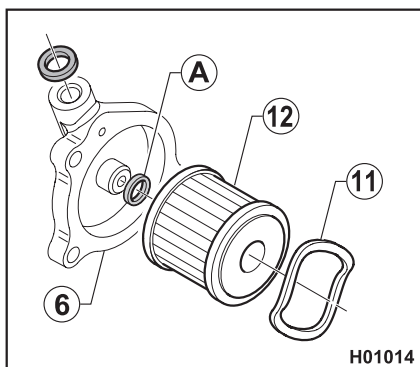
Check the O-ring (10) for damage and replace it if needed. Refit the spring (11) of the oil filter (12).

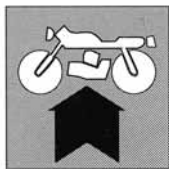


Refit the oil filter into its housing and tighten the screws (13) using an 8 mm wrench (5.5 Nm, 0.55 Kgm, 3.98 ft/lb).

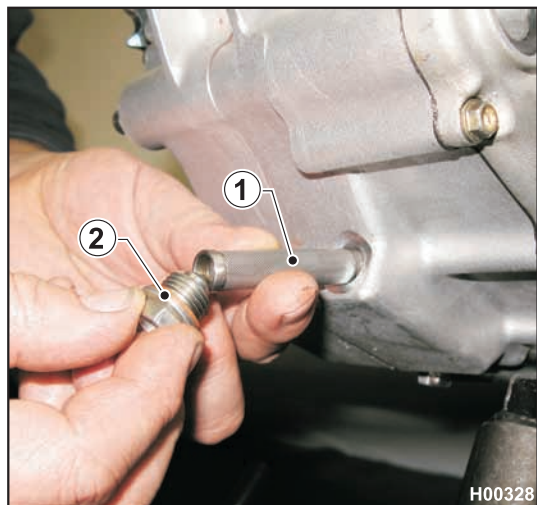


WARNING: When assembling filter to cover, make sure to fit the filter oil seal (A) first onto the cover (6).



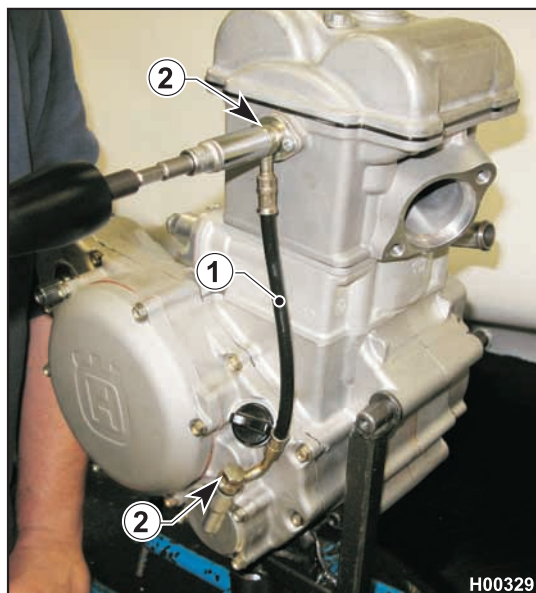


ENGINE REASSEMBLY



Filter and drain plug

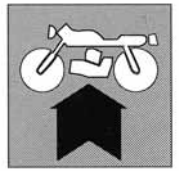
Fit the oil filter (1) and tighten the cap (2) into place with its gasket using a 12 mm wrench (25 Nm, 2.5 Kgm, 18.44 ft/lb).



Oil feed hose installation

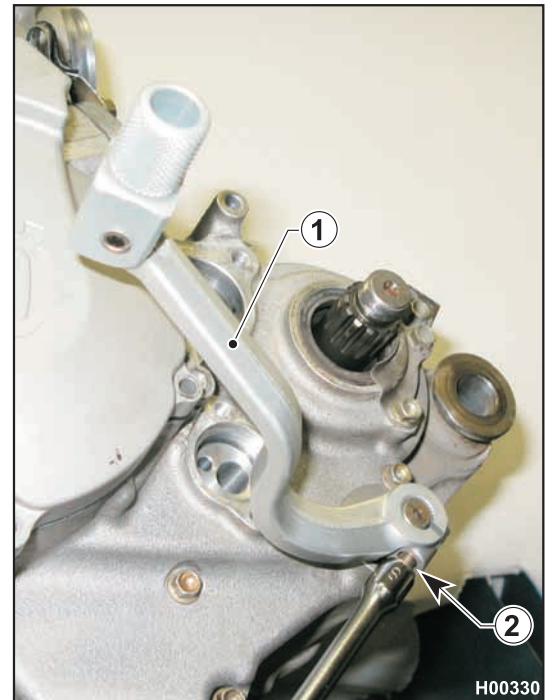
Refit the hose (1) and tighten the drilled screws (2) with their seals using a 12 mm wrench (8 Nm, 0.8 Kgm, 5.9 ft/lb).



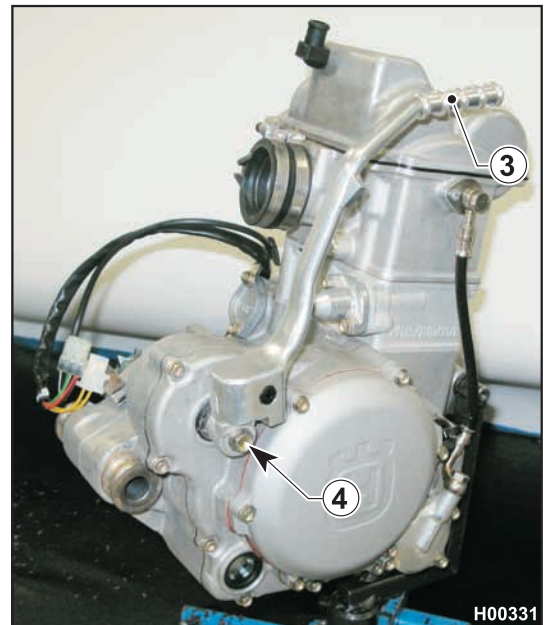


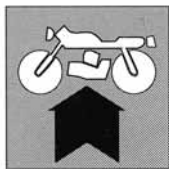
Gear shift and kick start pedal installation

Install the gear shift pedal (1) and tighten the screw (2) using an 8 mm wrench (8 Nm, 0.8 Kgm, 5.8 ft/lb).
Check the pedal (1) for damage.



Refit the kick start pedal (3) and tighten the screw (4) using a 12 mm wrench (25 Nm, 2.5 Kgm, 18.44 ft/lb + Loctite 272). Make sure that the pedal does not foul the cover.





ENGINE REASSEMBLY



Installing the engine and assembling the motorcycle

Install the engine and any parts you had removed in the order given below.

Place the engine in the chassis.

Insert the swinging arm shaft from the right-hand side and tighten its nut using a 22 mm wrench (122.5 Nm, 12.5 Kgm, 90.3 ft/lb).

Tighten the engine mounting bolts to the frame using a 12 mm wrench on the left-hand side and a 10 mm wrench on the right-hand side (35.3 Nm, 3.6 Kgm, 26 ft/lb).

Install the drive chain (fit the master link clip by setting the closed side facing the chain direction of rotation).

Install the clutch control on the engine and tighten the fitting with an 8 mm wrench (8 Nm, 0.8 Kgm, 5.8 ft/lb). Add clutch fluid.

On the left-hand side, use an 8 mm wrench to install the chain guide plate (8 Nm, 0.8 Kgm, 5.8 ft/lb). Fit the transmission sprocket cover and tighten its screws using a 6 mm wrench (10.4 Nm, 1 Kgm, 7.7 ft/lb).

Fit the spark plug cap to the spark plug. Install the rubber hose on the right-hand side of the cylinder head cover.

Refit the oil sump guard if you had removed it (14.7 Nm, 1.5 Kgm, 10.8 ft/lb).

Refit the coolant hoses with their clamps.

Refit the rear brake pedal with its bolt (41.6 Nm, 4.2 Kgm, 30.7 ft/lb + Loctite 243).

Refit the side guards of the chassis.

Refit the carburettor.

Refit the exhaust system (pipe retaining screws: 10.4 Nm, 1Kgm, 7.7 ft/lb) (exhaust pipe retaining screws: use an 8 mm wrench, 8.4 Nm, 0.8 Kgm, 5.8 ft/lb).

Refit the fuel tank together with the scoops.

Refit the fuel tank front retaining screw (10.4 Nm, 1Kgm, 7.7 ft/lb) and hook up the scoops to the spoilers on the radiators.

Refit the breather hose of the fuel tank plug on the steering stem. Refit the hose running from fuel tank to carburettor.

Refit the side panels with their retaining screws.

Refit the saddle and secure it with its rear fixing.



NOTES

1) Unless otherwise specified, standard torque values for the different thread sizes are as follows

M5x0.8 (5.6-6.2 Nm; 0.57-0.63 Kgm; 4.1-4.5 ft/lb)

M6x1 (7.6-8.4 Nm; 0.80-0.85 Kgm; 5.8-6.1 ft/lb)

M8x1.25 (24-26 Nm; 2.4-2.6 Kgm; 17.3-18.8 ft/lb)

2) For electrical connections, see relevant diagram included in Section M.

3) Bleed the clutch (see Section P).

4) Add 0.9 l of CASTROL POWER 1 RACING oil (10W-50) to the crankcase.

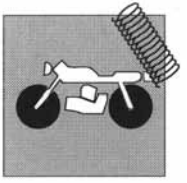
5) Add 1.1-1.3 l of AGIP COOL fluid to the right radiator.

6) Check that the kick start pedal moves freely.

7) Perform the necessary adjustments as outlined in Section D "Settings and adjustments".

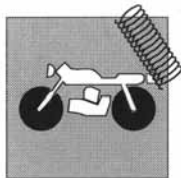


FRONT SUSPENSION



Section



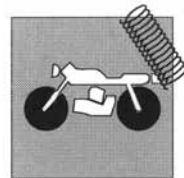


FRONT SUSPENSION

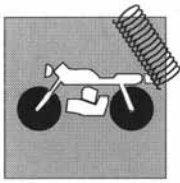
Front fork removal	I.4
Front suspension Mod. TC-TXC /2010	I.6
Service instructions for Ø48USD Kayba fork - TC-TXC 250/2010	I.6
Front suspension (TC - TXC)	I.7
Front fork disassembly (TC - TXC)	I.8
Front suspension Mod. TE /2010	I.18
Front suspension (TE)	I.18
Front suspension Mod. TC /2009	I.28
Front suspension	I.28
Service instructions for Ø50USD fork	I.29
Fork components	I.30
General overhaul instructions	I.31
Placing the fork in a vice	I.31
Troubleshooting	I.32
General maintenance	I.32
Cleaning the fork legs	I.33
Disassembly	I.33
Assembly	I.33
Bleeding	I.34
Draining oil	I.35
Cartridge removal	I.36
Checking and changing cartridge and compression valve setting	I.36
Cartridge removal	I.36
Rebound adjuster servicing	I.38
Disassembly	I.38
Assembly	I.38
Compression valve servicing	I.39
Disassembly	I.39
Assembly	I.39
Cartridge assembly	I.40
Separating inner and outer tube - sealing ring removal	I.43
Assembling inner and outer tube - sealing ring installation	I.44
Cartridge assembly	I.45
Oil filling	I.46
Installing the fork on the motorcycle	I.46
Settings	I.47
Rider sag adjustment	I.47
How to measure sag	I.47
Spring preload adjustment	I.48
Rebound adjustment	I.48
Compression adjustment	I.49



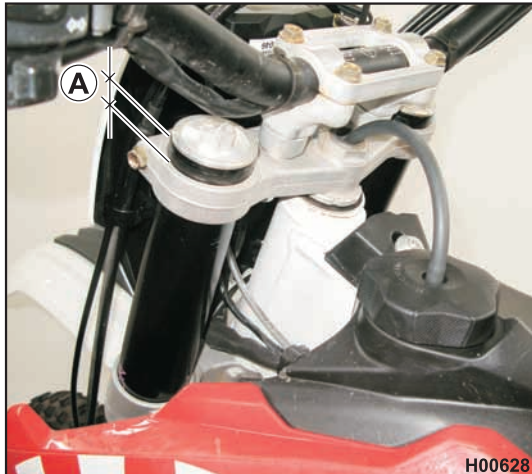
FRONT SUSPENSION



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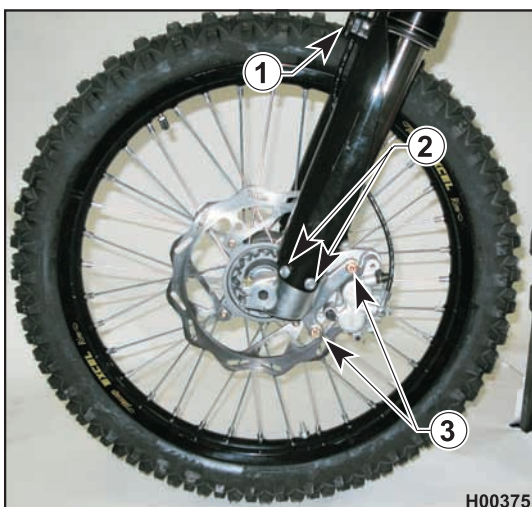


FRONT SUSPENSION



Front fork removal

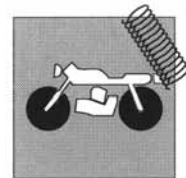
Measure height "A" (it will need to be restored to original value on assembly). Set a block under the engine and see that the front wheel is lifted from the ground and then proceed as follows:



- remove the screws (1) and the brake line clamp on the left-hand side;
- remove the six screws (2) and the fork leg guards;
- remove the brake calliper from the L.H. fork leg loosening the two retaining screws (3);
- remove the front wheel as described in Section "Y";



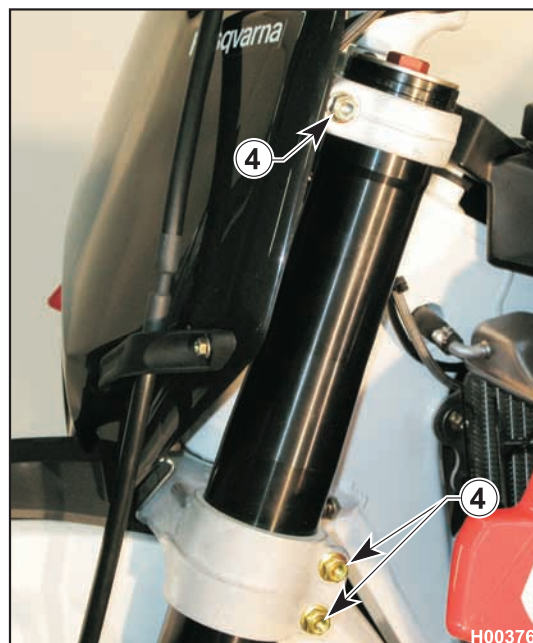
FRONT SUSPENSION

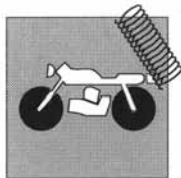


- loosen the bolts (4) that secure the fork legs to steering head and bottom yoke;
- remove the fork legs.

Refit fork legs and front wheel as described in Section "Y".

Set height "A" back to original value.





FRONT SUSPENSION

Front suspension Mod. TC-TXC /2010

Service instructions for Ø48USD Kayba fork - TC-TXC 250/2010

GENERAL

The fork uses a multi-valve damping system with rebound and compression adjustment and spring preload adjustment for static load.

Compression damping is controlled by a special valve located at the top of each fork leg. Rebound damping is controlled by a sealed cartridge located inside each inner tube.

Each fork leg has outer adjusters for compression and rebound damping.

Both fork legs have bleed valves to bleed air from the outer tube and drain screws to drain cartridge oil.

INNER TUBES: Special high-strength steel, chrome-plated and TIN-coated.

OUTER TUBES: CNC-machined aluminium alloy, anodised and polished inside.

SLIDING BUSHES: Teflon®-coated, stiction-free.

SEALS: Computer-designed sealing rings ensure maximum sealing on compression and minimal friction on rebound.

SPRINGS: Steel springs, different spring rates (K) available. (See Table for more detailed information).

OIL: Special KAYABA formulation prevents foaming and retains same viscosity under any operating conditions; stiction-free. Use SAE 5 oil for extremely cold weather.

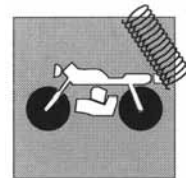
SPRING TABLE

Fork static load is determined by the spring contained in each upper leg: suspension response may be changed by changing the spring or the tube spacer that determines its preload, with no need to alter fork settings. "Spring+tube spacer" kits available as spare parts are listed below.

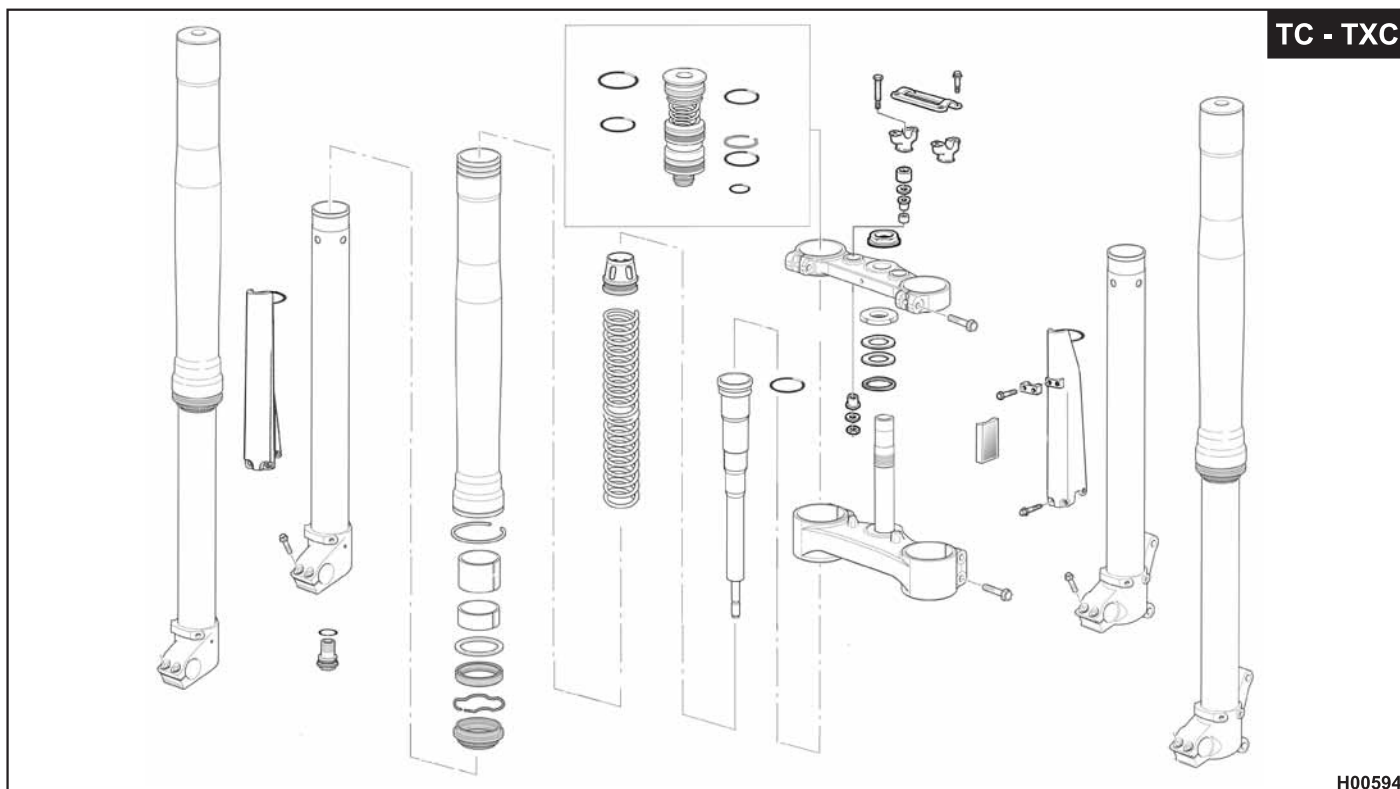
MODEL	SPRING RATE K (N/mm)	PART NO.
TXC-TC	4.5	8000 H2669
TE	4.2	8000 H2690



FRONT SUSPENSION



TC - TXC

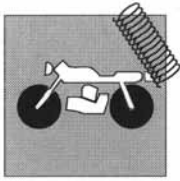


H00594

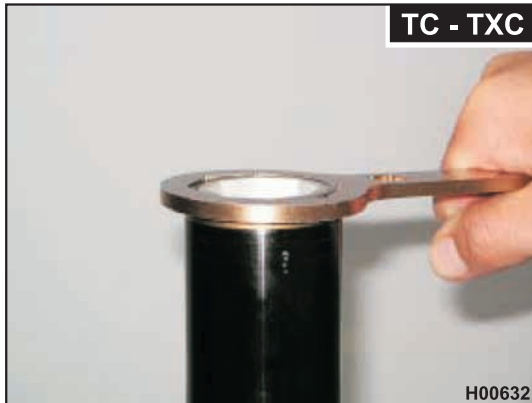
Front suspension (TC - TXC)

Front suspension is handled by a KAYABA upside-down telescopic hydraulic fork with advanced axle and 48 mm legs. Wheel travel is 300 mm.





FRONT SUSPENSION



Front fork disassembly (TC - TXC)

Loosen the cap nut at the top of each outer tube.

(Note: it is good practice to moderately slacken the cap nuts before removing the fork legs from the motorcycle).



Drain oil from the damper unit.



Clamp the wheel axle carrier in a vice and loosen the adjuster screw.



Push down the inner tube.

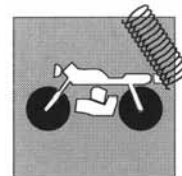
Slip the tool shown in the figure between wheel axle carrier and cartridge nut.

Hold the nut with a wrench and remove the adjuster screw.

Be careful not to hurt your fingers.



FRONT SUSPENSION



Take the cartridge out of the outer tube.



Do not remove the nut at the bottom end of the cartridge.

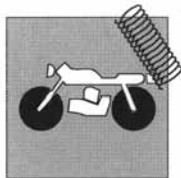


Remove the bottom valve assembly from the cartridge.
Hold the cartridge octagonal nut with the suitable tool to prevent rotation.
Use a similar tool in the octagonal recess of the bottom valve assembly.
Use a key to slacken the bottom valve assembly.



Check the O-rings on the bottom valve assembly for damage.
Replace as required.





FRONT SUSPENSION



If outer tube and inner tube are still assembled together, place the fork leg upside down and allow at least 20 minutes for oil to drain.



Remove the dust seal using a flat head screwdriver.



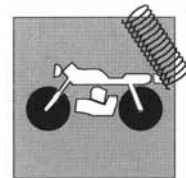
Remove the retaining ring using a flat head screwdriver.



Pull the inner tube until separating it from the outer tube.
Note: to facilitate removal, quickly (but carefully) pump the tubes back and forth until separating them.



FRONT SUSPENSION



Remove the sealing rings and the metal rings mounted on the inner tube.
Do not reuse any metal parts after removal.
Replace them with new components.
Replace damaged sealing rings.
Washer and retaining ring may be reused if they are not damaged.



Check the rebound adjuster rod for distortion or damage.
Replace as required.



Check the rebound adjuster.
Replace damaged O-rings.
Replace the complete assembly (do not reuse it).



Check the spring.
Replace it if:
outside diameter is damaged or exceedingly worn.
Free length is 449 mm (17.7 in.) or less.

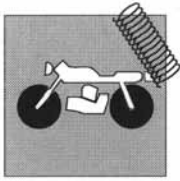


Check the inner tube.
Replace if distorted.
(Never attempt to repair or reuse a distorted fork tube).
If the tube shows surface defects, sand the surface.
If repair is not possible, replace the tube.
(Never reuse an inner tube if scored or showing bulges on the outer surface).

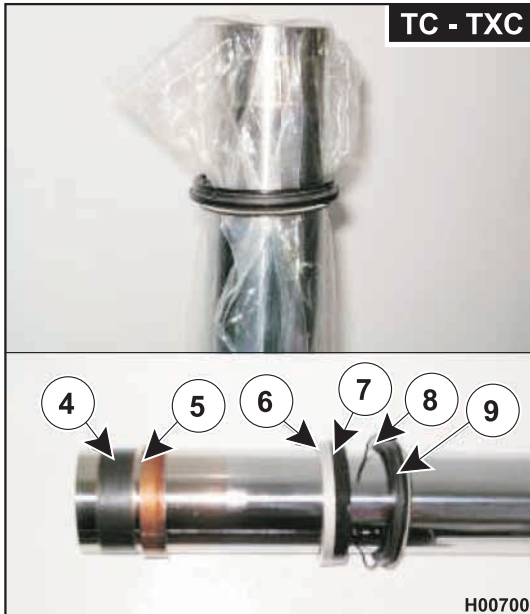


Check the outer tube.
Replace the tube if any distortion is detected or if the sliding surface is damaged.





FRONT SUSPENSION



Mount sealing rings and metal parts on the inner tube.
See the figure below for the installation sequence.

Note 1: Grease the edge of the sealing ring.

Note 2: Before sliding the sealing ring over the inner tube, cover tube edge with plastic as shown in the figure.

This will avoid damage to the oil seal lip.

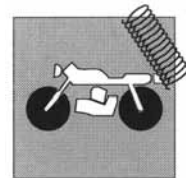


Fit metal bushing and washer to outer tube using an appropriate installer.
Fit the oil seal to the outer tube and push it home using an appropriate installer.
Make sure that the retaining ring groove inside the outer tube is fully visible.



Install the retaining ring.
Make sure that the retaining ring is fully seated in the groove inside the outer tube.

FRONT SUSPENSION



Fit the dust seal to the outer tube.
Make sure that there is not play between dust seal and outer tube.



Refit the cartridge.
Tighten the nut all the way onto the rebound adjuster rod.
Make sure rebound adjuster rod thread length is at least 15 mm (0.6 in.).

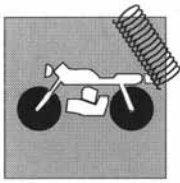


Fill the cartridge with the specified oil.

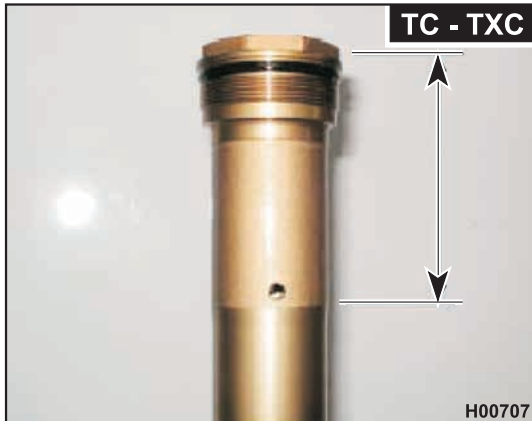


Pump the piston rod up and down repeatedly to remove any air from the cylinder.





FRONT SUSPENSION



Pull the piston rod until fully extended.
Check oil level. It should be about 145 mm (5.7 in.).



Push the piston rod all the way down and install the bottom valve assembly.
With the bottom valve assembly installed, check that the piston rod is fully extended.



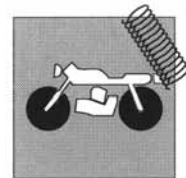
Hold the cartridge octagonal nut to prevent rotation.
Use a similar tool in the octagonal recess of the bottom valve assembly.
Tighten the bottom valve assembly to 29 Nm (21.4 ft/lb) using a wrench.



Hold the cartridge with the piston rod end pointing downwards as shown in the figure.
Pump the piston rod up and down a dozen times to help oil reach all points of the unit.



FRONT SUSPENSION



Drain excess oil from the cartridge pushing the damper unit all the way home. Be careful not to distort or damage the piston rod or any other parts. Please note that excess oil may flow out from the hole located before the reservoir.

If you see no oil flowing out, it means that there isn't enough oil in the cartridge.

Add oil to the cartridge before refitting it.



Drain excess oil from the reservoir.

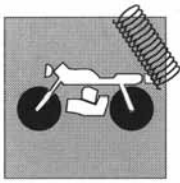


Clean off any excess oil from the cartridge.
Install spring guide and spring on the cartridge.



Insert the cartridge into the inner tube.





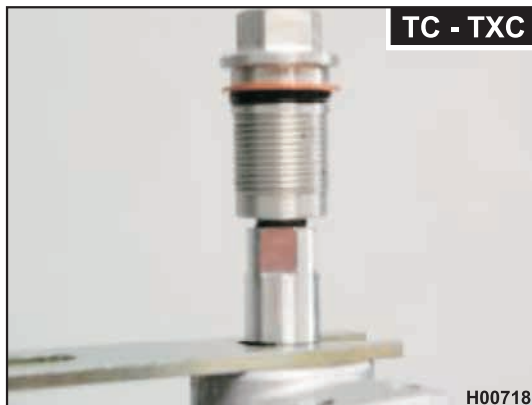
FRONT SUSPENSION



Push down the inner tube.

Slip the tool shown in the figure between wheel axle carrier and cartridge nut. Insert the rebound adjuster rod into the piston rod and tighten the adjuster screw.

Be careful not to hurt your fingers.



Tighten the adjuster screw all the way in.

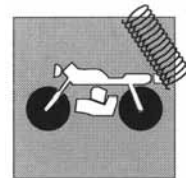
Make sure that there is some play between the bottom edge of the adjuster screw and the upper edge of the nut.



Tighten nut and adjuster to 28 Nm (20.6 ft/lb) using a wrench.



FRONT SUSPENSION



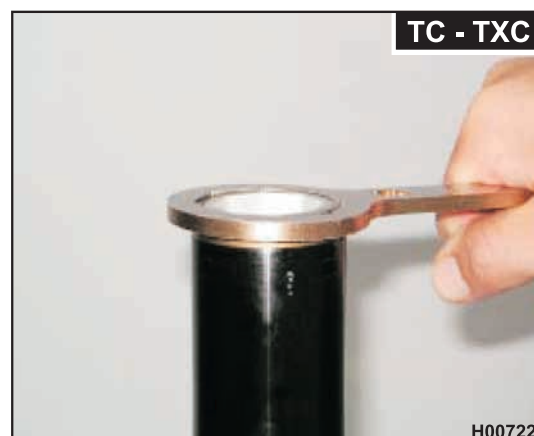
Clamp the wheel axle carrier in a vice and tighten the adjuster screw onto the carrier to 55 Nm (40.5 ft/lb).

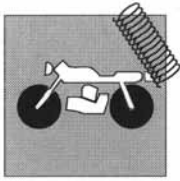


Fill the outer tube with the specified quantity of oil.



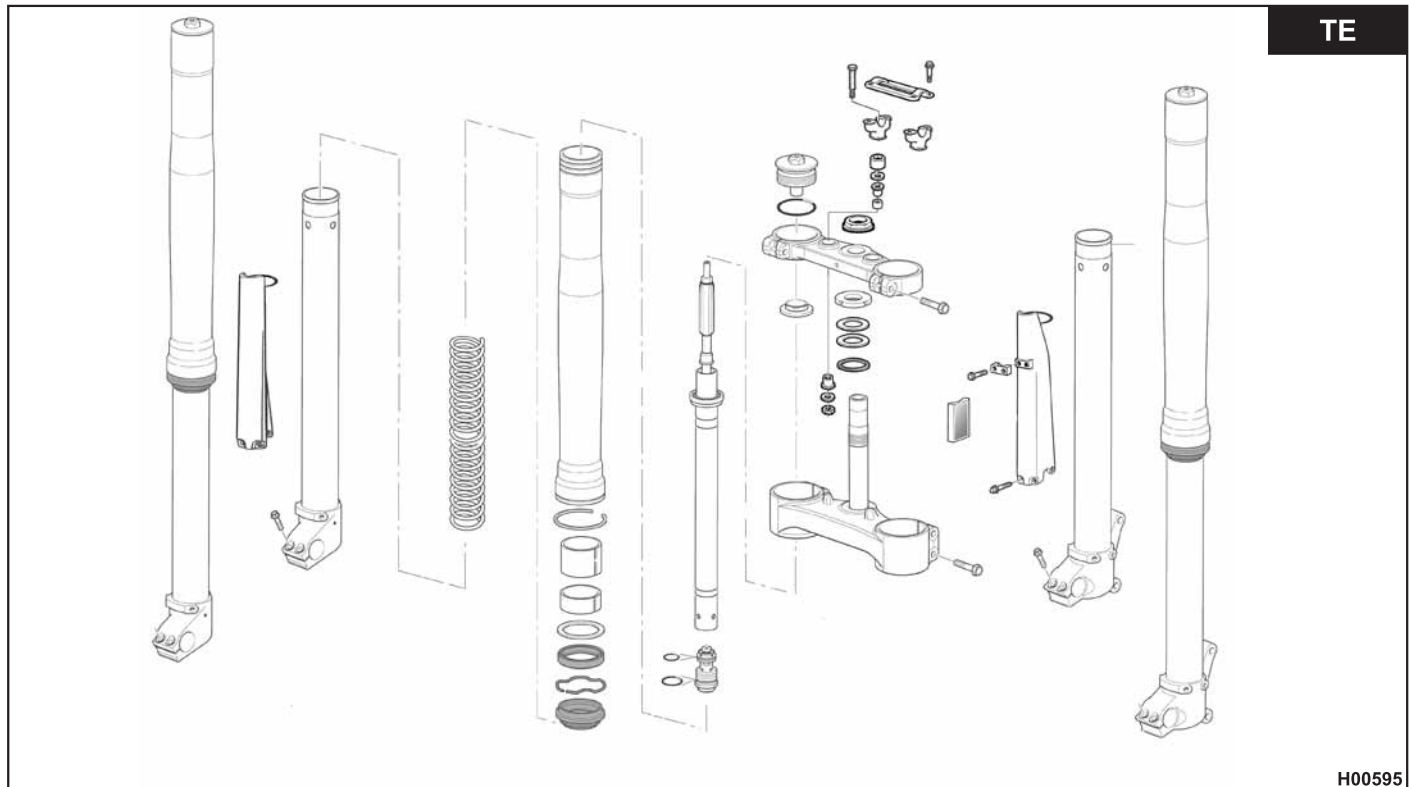
Tighten the cylinder onto the outer tube to 29 Nm (21.4 ft/lb).





FRONT SUSPENSION

Front suspension Mod. TE /2010

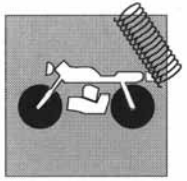


Front suspension (TE)

Front suspension is handled by a KAYABA upside-down telescopic hydraulic fork with advanced axle and 48 mm legs. Wheel travel is 300 mm.



FRONT SUSPENSION



Loosen the cap nut at the top of each outer tube.
(Note: it is good practice to moderately slacken the cap nuts before removing the fork legs from the motorcycle).



Loosen the fork cap nut and the nut with a wrench.

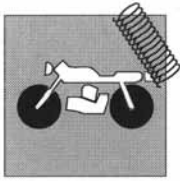


Remove top cap nut, spring retainer, spring and rebound adjuster rod.



Drain the oil.
Pump the piston rod up and down to drain oil from the cylinder.





FRONT SUSPENSION



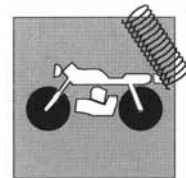
Remove nut, spring guide, O-ring and collar bushing.



Hold the cartridge top end steady.
Loosen and remove the bottom valve assembly.



FRONT SUSPENSION

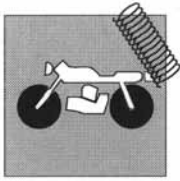


Take the cartridge out of the outer tube.



Remove the dust seal using a flat head screwdriver.





FRONT SUSPENSION



Remove the retaining ring using a flat head screwdriver.



Pull the inner tube until separating it from the outer tube.
Note: to facilitate removal, quickly (but carefully) pump the tubes back and forth until separating them.



Remove the sealing rings and the metal rings mounted on the inner tube.
Do not reuse any metal parts after removal.
Replace them with new components.
Replace damaged sealing rings.
Washer and retaining ring may be reused if they are not damaged.



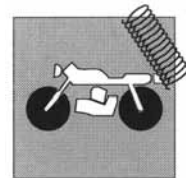
Check the rebound adjuster rod for distortion or damage.
Replace as required.



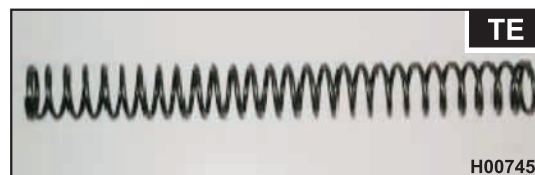
Loosen and remove the bottom valve assembly.
Replace damaged O-rings.
Replace the complete assembly (do not reuse it).



FRONT SUSPENSION



Check the spring.
Replace it if:
outside diameter is damaged or exceedingly worn.
Free length is 457 mm (18 in.) or less.



Check the inner tube.
Replace if distorted.
(Never attempt to repair or reuse a distorted fork tube).
If the tube shows surface defects, sand the surface.
If repair is not possible, replace the tube.
(Never reuse an inner tube if scored or showing bulges on the outer surface).

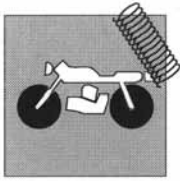


Check the outer tube.
Replace the tube if any distortion is detected or if the sliding surface is damaged.



Mount sealing rings and metal parts on the inner tube.
See the figure below for the installation sequence.
Note 1: Grease the edge of the sealing ring.
Note 2: Before sliding the sealing ring over the inner tube, cover tube edge with plastic as shown in the figure.
This will avoid damage to the oil seal lip.





FRONT SUSPENSION



Fit metal bushing and washer to outer tube using an appropriate installer.
Fit the oil seal to the outer tube and push it home using an appropriate installer.
Make sure that the retaining ring groove inside the outer tube is fully visible.



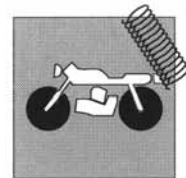
Install the retaining ring.
Make sure that the retaining ring is fully seated in the groove inside the outer tube.



Fit the dust seal to the outer tube.
Make sure that there is not play between dust seal and outer tube.



FRONT SUSPENSION

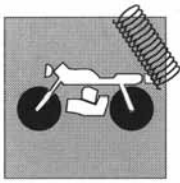


Insert the cartridge into the outer tube.

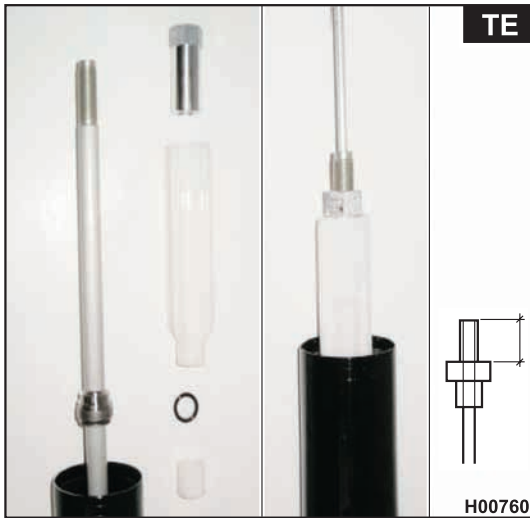


Hold the cartridge top end into place.
Tighten the bottom valve assembly to 55 Nm (40.5 ft/lb).





FRONT SUSPENSION



TE

Fit collar bushing, O-ring, spring guide and nut onto piston rod.
Insert the rebound adjuster rod into the piston rod.
Make sure that at least an 18 mm (0.71 in.) portion of the rebound adjuster rod protrudes from the piston rod.

H00760



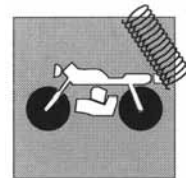
TE

Oil filling.
Fill with the specified quantity of oil.
Fill the damper unit with the specified quantity of oil.
Slowly pump the piston rod up and down to help oil reach all points of the cartridge.
Note: if you haven't drained all oil from the damper unit on disassembly, follow the procedure outlined below (Filling oil to specified level).

H00762



FRONT SUSPENSION



Filling oil to specific level

Fill the damper unit with oil up to the top edge of the outer tube.

Slowly pump the outer tube up and down to help oil flow equally into both inner and outer tube.

Now slowly pump the piston rod up and down to help oil reach all points of the cartridge.

(Note: add oil if level in the damper unit is too low).

Finally top up to the upper edge of the outer tube.

Allow the fork leg to rest until no more air bubbles can be seen, then top up oil to specified level.

Insert the rebound adjuster rod into the piston rod.

Insert spring and spring guide retainer and tighten the cap nut.



Tighten fork cap nut and nut to 28 Nm (20.6 ft/lb).



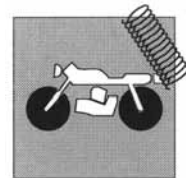
Tighten cap nut onto outer tube to 30 Nm (22 ft/lb).





H00342

Front suspension is handled by a MARZOCCHI USD telescopic upside-down hydraulic fork with advanced axle and 50 mm legs. Wheel travel is 300 mm.



Service instructions for Ø50USD fork

GENERAL

The fork uses a multi-valve damping system with rebound and compression adjustment and spring preload adjustment for static load.

Compression damping is controlled by a special valve located at the top of each fork leg. Rebound damping is controlled by a sealed cartridge located inside each inner tube.

Each fork leg has outer adjusters for compression and rebound damping.

Both fork legs have bleed valves to bleed air from the outer tube and drain screws to drain cartridge oil.

INNER TUBES: Special high-strength steel, chrome-plated and TIN-coated.

OUTER TUBES: CNC-machined aluminium alloy, anodised and polished inside.

SLIDING BUSHES: Teflon®-coated, stiction-free.

SEALS: Computer-designed sealing rings ensure maximum sealing on compression and minimal friction on rebound.

SPRINGS: Steel springs, different spring rates (K) available. (See Table for more detailed information).

OIL: Special MARZOCCHI formulation prevents foaming and retains same viscosity under any operating conditions; stiction-free.

Use MARZOCCHI SAE 5 oil item no. 55 00 03 for extremely cold weather.

SPRING TABLE

Fork static load is determined by the spring contained in each upper leg: suspension response may be changed by changing the spring or the tube spacer that determines its preload, with no need to alter fork settings. "Spring+tube spacer" kits available as spare parts are listed below.

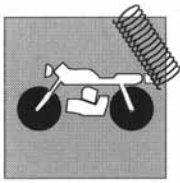
SPRING RATE K (N/mm)

4.8

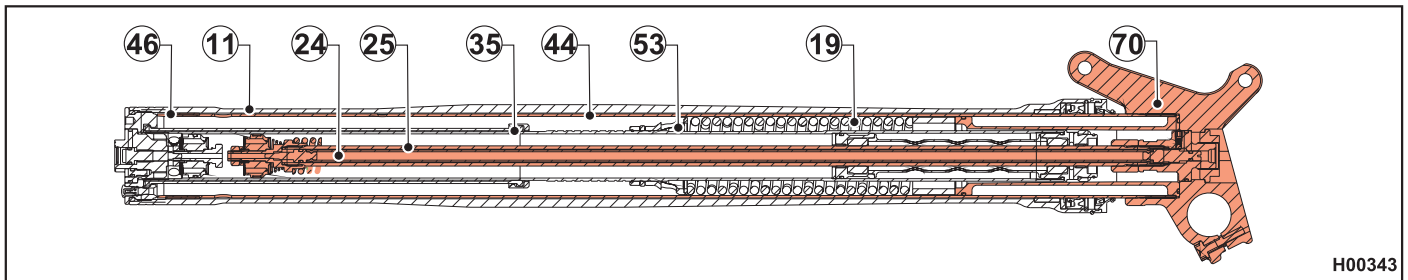
PART NO.

8000 H1994





FRONT SUSPENSION



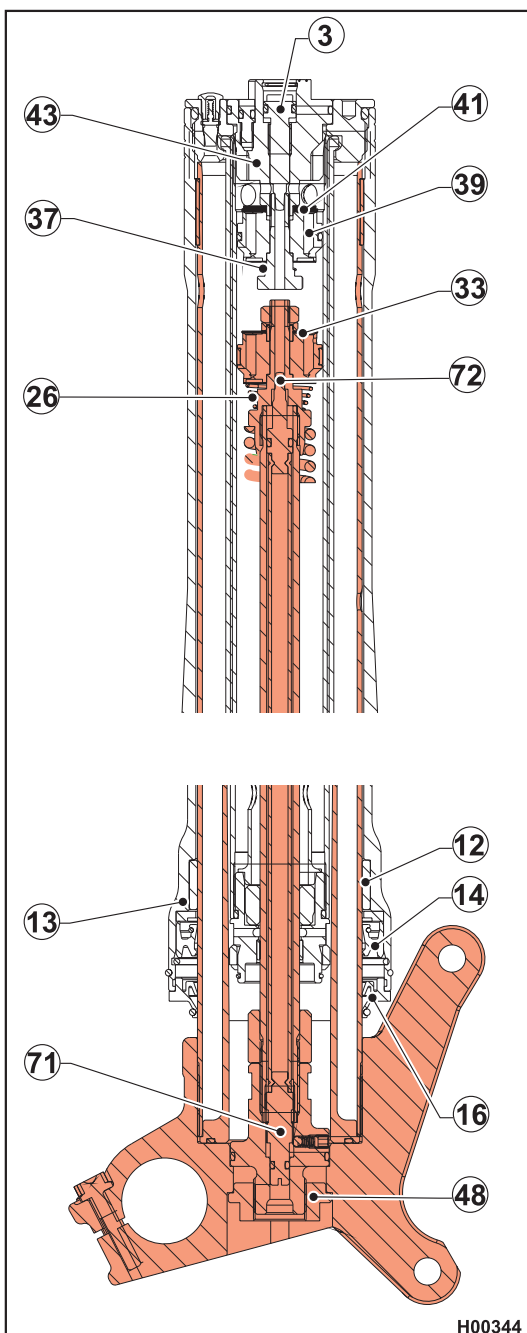
H00343

Fork components

The SHIVER 50 Factory Works fork uses a multi-valve damping system with the same configuration on both fork leg.

Each fork leg is a complete suspension system to be set up separately.

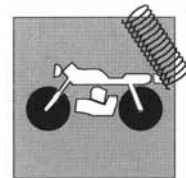
- 3) Compression adjuster
- 11) Outer tube
- 12) Bottom sliding bushing
- 13) Retainer
- 14) Sealing ring
- 16) Dust seal
- 19) Spring
- 24) Rebound adjuster rod
- 25) Rod
- 26/37) Washer return spring
- 33) Rebound damping piston washers
- 35) Cartridge case
- 39) Compression piston
- 41) Compression valve washers
- 43) Compression valve
- 44) Inner tube
- 46) Top sliding bushing
- 48) Bottom nut
- 53) Spring preload adjuster
- 70) Wheel axle carrier
- 71) Rebound adjuster
- 72) Rebound adjuster taper needle



H00344

In the next figure, moving parts that support the wheel are shown in grey, whereas those parts that are fixed to the motorcycle chassis are shown in white.





General overhaul instructions

- After taking the fork apart, always use new, genuine Marzocchi seals on assembly.
- When tightening two screws or nuts close to each other, always follow a 1-2-1 pattern and use a torque wrench; observe the specified tightening torque values (see Tightening torque figures table).
- Never use flammable or corrosive solvent to clean parts, or you might damage the seals. If needed, use specific detergents, preferably biodegradable, non corrosive, non flammable or with high flash point, compatible with seal materials.
- Always lubricate the mating surfaces of fork parts before assembly.
If the fork is to be left unused for long periods of time, lubricate all mating parts with fork oil.
- Never release lubricants, solvents or detergents that are not fully biodegradable into the environment; collect them suitable containers and dispose of them according to applicable rules.
- Always grease sealing ring lips before assembly.
- Use only metric tools. Never use (US) imperial tools. (US) imperial tools of sizes close to those of metric tools may damage bolts and screws and make them impossible to remove.
- Use a screwdriver of the appropriate type and size to unscrew slot head or Phillips screws.
- When using a screwdriver to install or remove metal retaining rings, O-rings, pilot bushings or seals, avoid damaging the components with the tip of the screwdriver.
- Use only genuine Marzocchi parts.
- Before servicing the front fork, make sure to have a Marzocchi service kit for your fork (if applicable) available, including the necessary parts for a complete fork service or overhaul.
- Perform service in a clean, orderly, well lit environment. Avoid servicing the fork outdoors.
- Make sure the work area is free from metal filing or dust.
- Thoroughly wash the motorcycle and especially the fork before servicing.
- Never use jet cleaners to wash the motorcycle.
- Even using a gardening hose might cause the pressurised water jet to get past the seals and affect the proper operation of your Marzocchi fork. Clean motorcycle and Marzocchi forks thoroughly with water and neutral soap.
- It is good practice to service one fork leg at a time.
- Do not make changes to fork components.

Placing the fork in a vice

Certain maintenance procedures may require clamping the fork in a vice in order to tighten fork components.



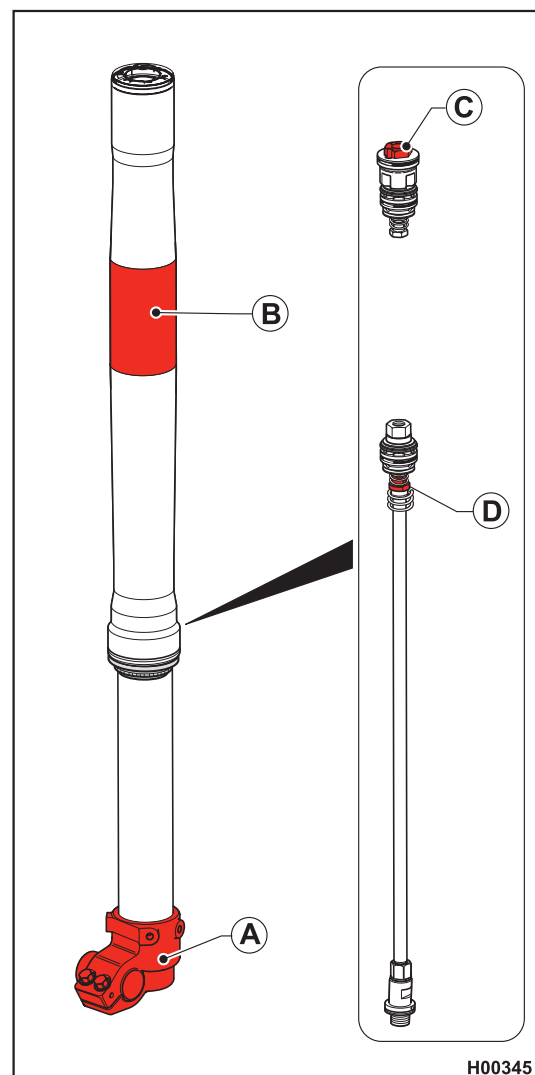
WARNING

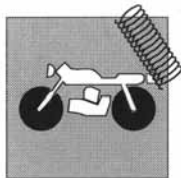
Improper use of a vice may cause irreparable damage to the fork, leading to accidents, injury or death.

- Closely follow these instructions:
- Only use a vice when strictly necessary.
- Always use a vice with soft jaws.
- Do not overtighten when clamping the fork.
- Parts of parts that could damage and cause the suspension to malfunction when out-of-round must never be clamped in a vice.

Fork areas that can be clamped in a vice are highlighted in the diagram.

- A Wheel axle carrier.
- B Outer tube area normally clamped in the bottom yoke.
- C Compression valve nut.
- D Cartridge, at tube spacer/case nut.





FRONT SUSPENSION


Troubleshooting - Causes - Remedy

Possible troubles that may occur in service are covered in this paragraph. For each trouble, possible causes and suggested remedy is indicated.

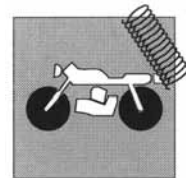
TROUBLE	CAUSE	REMEDY
Oil leaks past the sealing ring	<ol style="list-style-type: none"> 1. Worn sealing ring 2. Scored inner tube 3. Dirty sealing ring 	<ol style="list-style-type: none"> 1. Replace sealing ring 2. Replace tube and sealing ring 3. Replace sealing ring and dust seal and change oil
Oil leaks from fork leg bottom	<ol style="list-style-type: none"> 1. Damaged rebound adjuster O-ring 2. Loose rebound adjuster unit 	<ol style="list-style-type: none"> 1. Replace O-ring 2. Tighten rebound adjuster unit
Loss of feedback	<ol style="list-style-type: none"> 1. Worn sliding bushings 2. Spent oil 	<ol style="list-style-type: none"> 1. Replace sliding bushings 2. Change oil
Unsmooth movement of legs	<ol style="list-style-type: none"> 1. Fork leg improperly aligned 	<ol style="list-style-type: none"> 1. Loosen wheel axle and achieve correct alignment
Fork response unaffected by changes to setting	<ol style="list-style-type: none"> 1. Needle inside rod is stuck 2. Adjuster screw stuck 3. Debris in oil 4. Valves clogged by debris 	<ol style="list-style-type: none"> 1. Clean or replace rod 2. Remove and clean adjuster screw 3. Change oil and thoroughly clean internal components of fork 4. Change oil and thoroughly clean internal components of fork
Fork feels too soft regardless of setting	<ol style="list-style-type: none"> 1. Low oil level 2. Spring too soft or unserviceable 3. Oil viscosity too low 	<ol style="list-style-type: none"> 1. Top up to correct level 2. Replace spring 3. Change to oil with higher viscosity rating
Fork feels too stiff regardless of setting	<ol style="list-style-type: none"> 1. Oil level too high 2. Oil viscosity too high 3. Spring too stiff or unserviceable 	<ol style="list-style-type: none"> 1. Top up to correct level 2. Change to oil with lower viscosity rating 3. Replace spring

General maintenance

	Usage			
	Intensive		Normal	
	Motocross	Enduro	Motocross	Enduro
Check torque of nuts and bolts	Before each use			
Clean dust seals use	After each race	After each race	After each use	After each
Change oil	6 hours	20 hours	30 hours	60 hours
Change sealing rings	6 hours	20 hours	30 hours	60 hours

 When the motorcycle is used on muddy or sandy terrain, shorten maintenance intervals by 30%.





Cleaning the fork legs



This can be done with the fork installed.

The dust seals of Marzocchi forks are grease lubricated so the inner tubes will slide more easily, especially after long period of inactivity.

This grease may melt in service and run down the inner tubes, so the fork will look like it is leaking oil.

Inspect the suspension to establish whether an oil leak exists. Clean the outer surfaces of the fork, especially inner tubes and dust seals, thoroughly after each use.



WARNING

Do not ride a motorcycle with a leaking fork. Eliminate any oil leaks before using the motorcycle.

Disassembly

Thoroughly clean the inner tube (44) before disassembly.

Pry the dust seal (16) off the outer tube (11) with a small screwdriver, taking care not to scratch or damage inner and outer tube.

Slide the dust seal over the inner tube and blow the inner side of the dust seal and its seat in the outer tube with compressed air.

Lubricate the dust seal and the visible surface of the sealing ring with silicone-based grease.



WARNING

Any bugs sticking to the fork legs must be cleaned off promptly, or they may cause severe damage to the suspension.



WARNING

Never use metal tools to dislodge dirt.

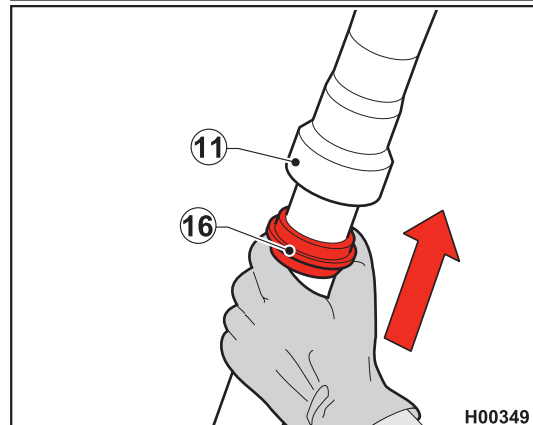
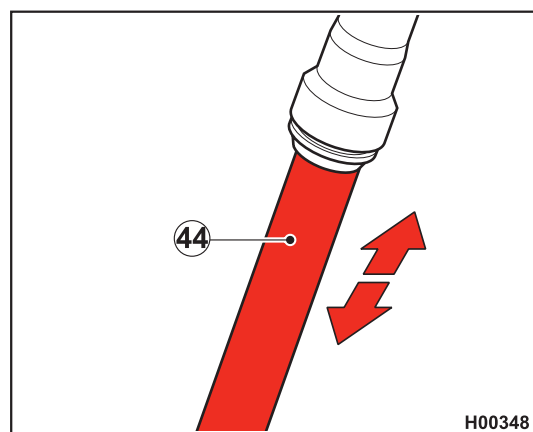
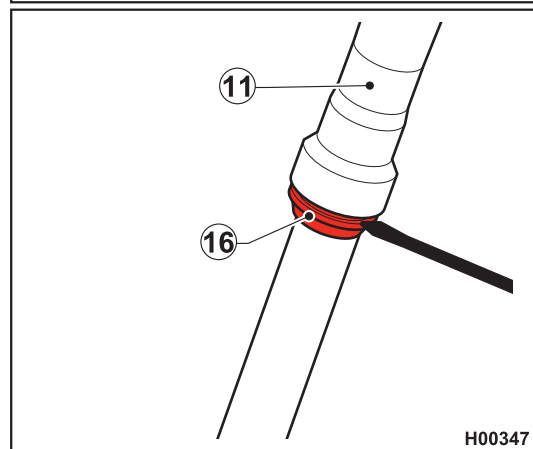
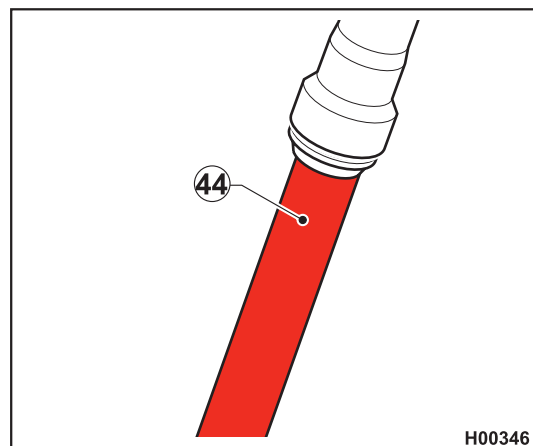
Pump the fork legs through a short stroke and remove any dirt from the inner tubes (44).

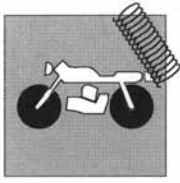
Wipe off any oil/grease and dirt with a soft cloth.

Lubricate the dust seal and the visible surface of the sealing ring with silicone-based grease.

Assembly

Slide the dust seal (16) over the outer tube (11) and push it into place with your hands.





FRONT SUSPENSION

Bleeding



Perform this procedure with the fork legs removed and fully extended or with the fork installed and the front wheel lifted off the ground.

Air entering into the fork legs in service will affect pressure and may cause the fork to malfunction. This is due to the special configuration of the sealing rings that hold air inside the fork legs.

Both fork legs should be bled monthly or after each race.

You can tell that a fork needs bleeding when SAG decreases or when the suspension feels hard (as the additional pressure introduced by air increases preload).

You will need a small pin punch to perform this procedure.

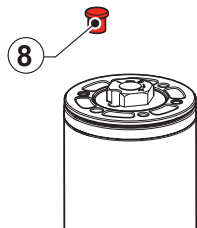
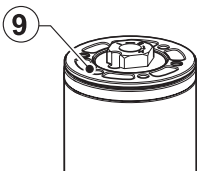
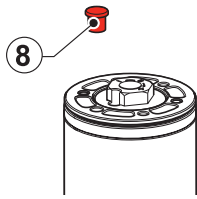
Air bleed valves are located on the top caps of each fork leg.

If the fork is not operating properly or movement is becoming less smooth, perform the following procedure:

Remove the protection plug (8).

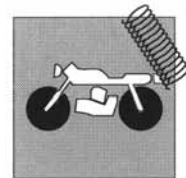
Push down the air valve (9) using a small pin punch and release all pressure from the fork leg.

Refit the protection plug (8).



H00350





Draining oil



WARNING

This procedure can only be done with the fork removed.



It is good practice to slightly slacken the cap nut before removing the fork leg from the yokes.

Follow the motorcycle manufacturer's instructions to remove the fork leg from the yokes.

Clamp the fork leg (11) in a vice.

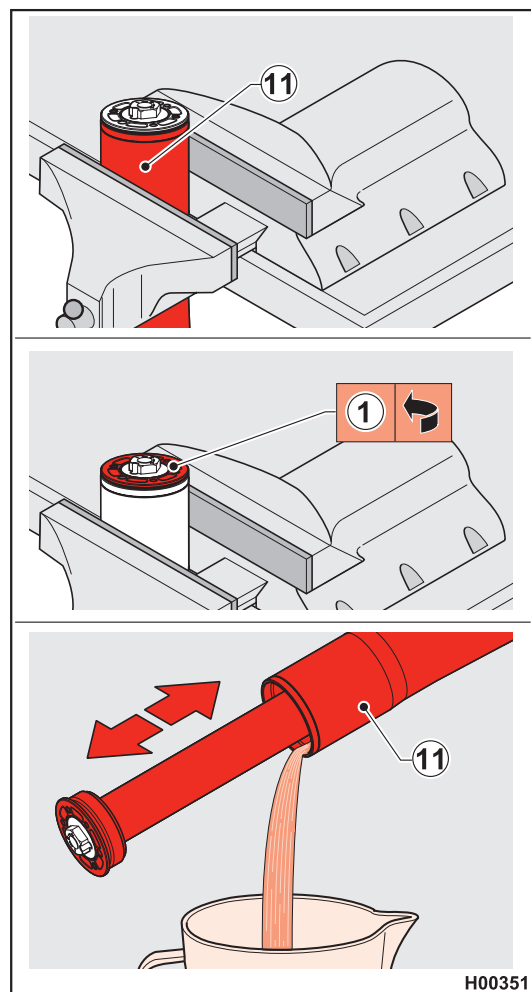
Fully unscrew the cap nut (1) from the inner tube using a 4 mm pin wrench.

Slowly push down the outer tube (11) over the inner tube.

Take the fork leg (11) out of the vice and tilt it into a pan with suitable capacity to drain oil; pump the fork repeatedly to help all oil drain out.

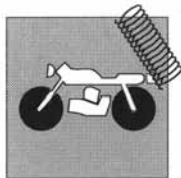


Look at the appearance, thickness and quality of drained oil to assess the condition of seals and pilots; a thick, dark oil with solid matter floating in it indicates that pilot bushes and seals need replacing.

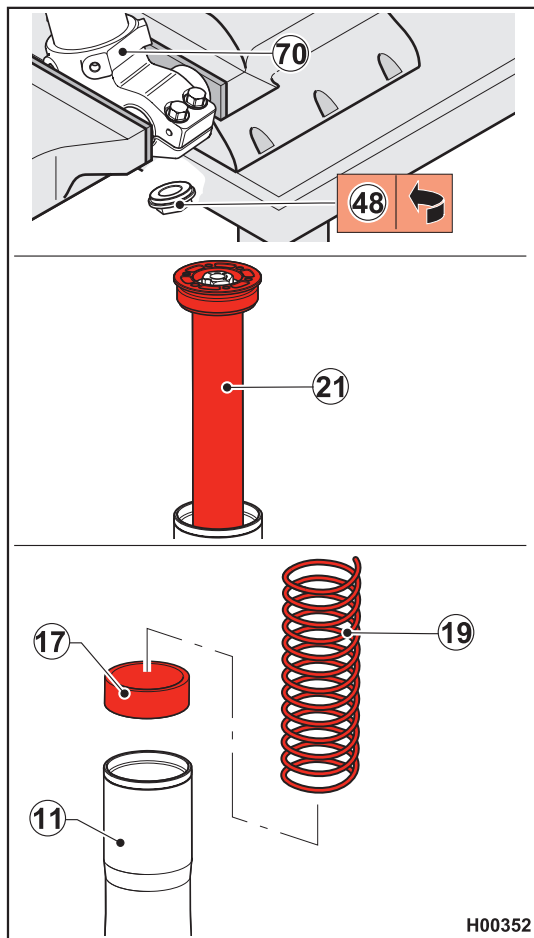


H00351





FRONT SUSPENSION



Cartridge removal



WARNING!

Drain all oil from the fork leg before performing this procedure.

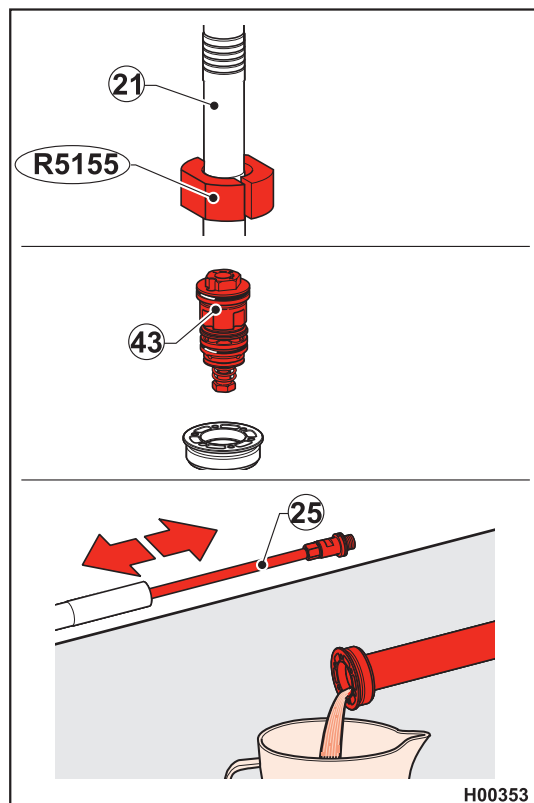
Clamp the wheel axle carrier (70) in a vice.

Loosen the bottom lock nut of the cartridge (48) using a 21 mm socket wrench.

Remove the cartridge bottom lock nut (48).

Slide the complete cartridge assembly (21) out of the inner tube.

Slide spring (19) and preload spacer (17) out of the outer tube (11).



Checking and changing cartridge and compression valve setting

Cartridge disassembly

Turn the rebound adjuster to fully closed position (fully clockwise).

Clamp the cartridge (21) in a vice as shown in the diagram using the suitable protector (R5155).

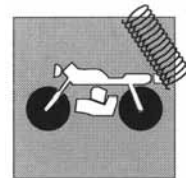
Loosen the compression valve unit (43) with a 21 mm wrench.

Remove the complete compression valve unit (43).

Take the cartridge out of the vice and tilt it into a pan with suitable capacity to drain oil; pump repeatedly pushing and pulling the damper rod (25) in and out several times to help all oil drain out.



FRONT SUSPENSION



Hold the rebound adjuster (24) using a 17 mm open-end wrench and loosen the check nut (27) with another 17 mm open-end wrench.

Remove rebound adjuster (24) and check nut (27) from the damper rod.

Apply adhesive tape over the threaded end of the rod (25). Apply one turn only, stretching the tape taut and do not overlap it.

Push the rod (25) towards the cartridge until sliding it out.

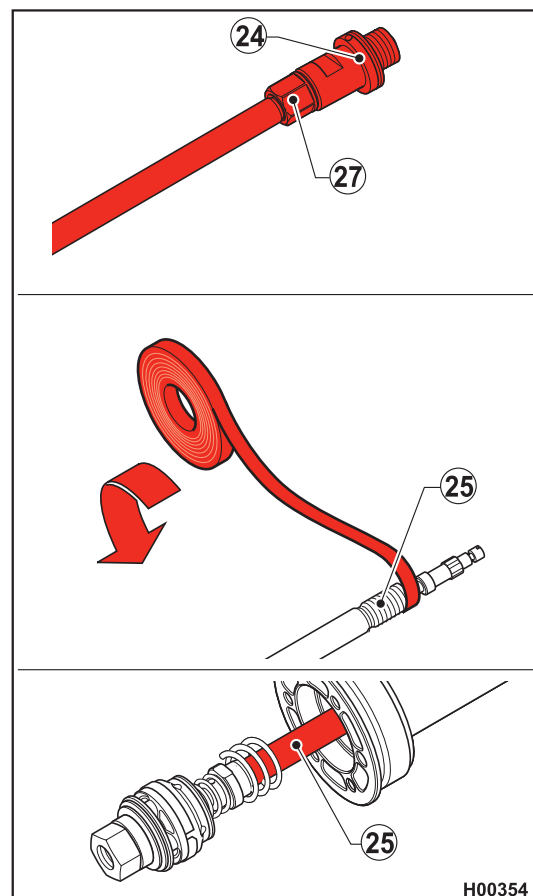


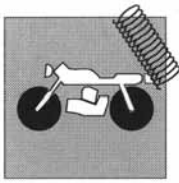
Damper and compression valve can be fully serviced. Overhaul and setting procedures for damper and compression valve are covered in paragraphs 4.7.2/4.7.3.

Check the piston ring for wear.

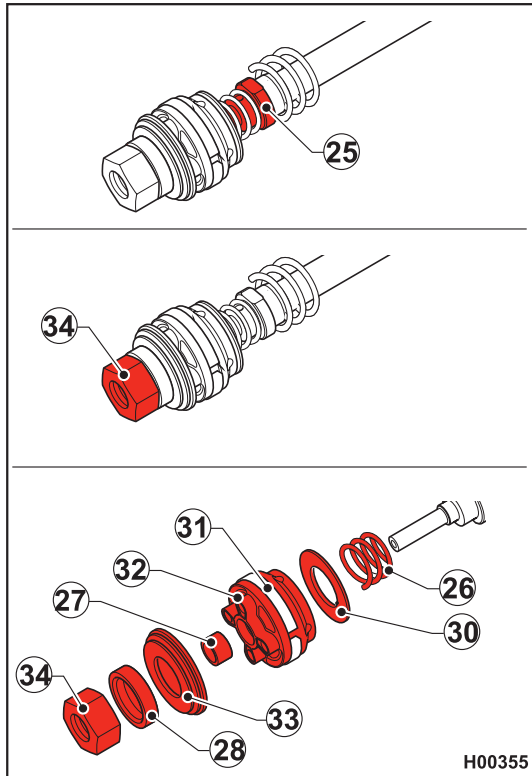


For cartridge and compression valve assembly instructions, see paragraph 4.7.4.





FRONT SUSPENSION



Rebound adjuster servicing

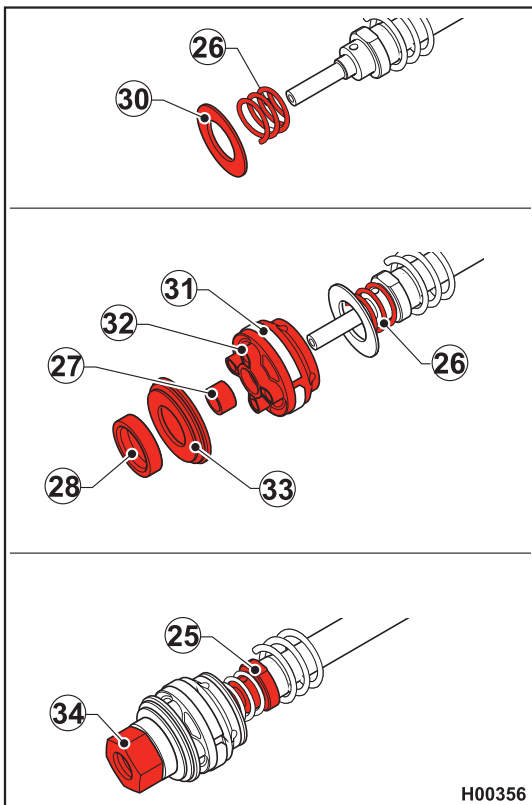
Disassembly

Push back the return spring, away from rod end.

Clamp the end of the rod (25) at the 17 mm nut in a vice. Be careful not to damage the washers and do not overtighten.

Loosen the nut (34) using a 10 mm wrench.

Remove in the order: nut (34), calibrated spacer (28), washer or washer stack controlling rebound damping (33), washer centring bushing (27), piston (32) with its ring (31), by-pass washer or washer stack (30) and spring (26).



Assembly



Washers (33) and piston (32) control rebound damping. When needed, the fork's rebound response may be tuned by choosing washers (33) and a piston (32) with different specifications. The by-pass washers (30) control compression damping. When needed, the fork's compression response may be tuned by choosing washers (30) with different specifications.



WARNING

Use only genuine Marzocchi washers and pistons. Do not make changes to fork components.

Replace the piston ring (31) if needed.

Slide spring (26) and by-pass washer or washer stack (30) over rod end.

Hold the spring compressed and insert in the order: piston (32) with its ring (31), washer centring bushing (27), rebound washer or washer stack (33), and calibrated spacer (28).



WARNING

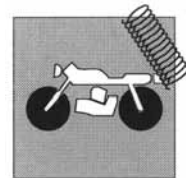
The piston (32) has a mounting position (shown in the figure). Its cylindrical section must be facing away from the rebound washers.

Tighten the nut (34) finger tight.

Tighten the nut (34) to the specified torque using a 10 mm wrench (see Tightening Torque Figures table).

Remove the damper rod (25) from the vice.





Compression valve servicing

Disassembly

Clamp the compression valve (43) at the flat faces in a vice. Be careful not to damage the washers and do not overtighten.

Loosen the screw (36) using a 12 mm wrench.

Remove in the order: screw (36), spring (37), by-pass washer (38), piston (39) with its O-ring (40), compression washer or washer stack (41).

Assembly



Washers (41) and piston (39) control compression damping. When needed, the fork's compression response may be tuned by choosing washers (41) and a piston (39) with different specifications. The by-pass washer (38) is necessary for suspension operation but plays no role in the setting procedure. Never replace this washer (38) with another part with different specifications.



WARNING

Use only genuine Marzocchi washers and pistons. Do not make changes to fork components.

Replace the piston O-ring (40) if needed.

Install the compression washer or washer stack (41) and the piston (39) with its O-ring (40) on the compression valve.

Slide the spring (37) and the by-pass washer (38) over the screw (36).

Hold the spring compressed and tighten the screw (36) onto the compression valve (43). Make sure to tighten the screw fully home into its seat and check that the washer moves freely through its full stroke.



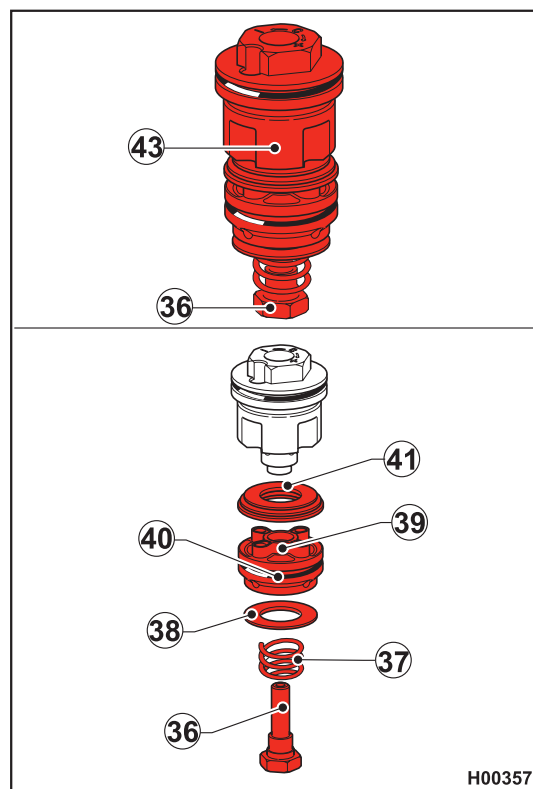
WARNING

The piston (39) has a mounting position (shown in the figure). Its cylindrical section must be facing away from the compression washers.

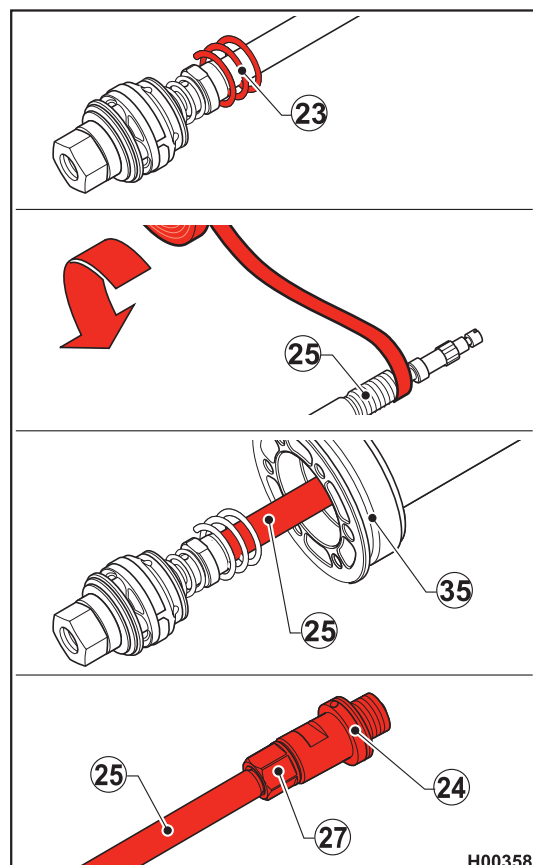
Tighten the screw (36) finger tight.

Clamp the compression valve (43) in a vice being careful not to overtighten.

Tighten the screw (36) to the specified torque using a 12 mm wrench (see Tightening Torque Figures table).

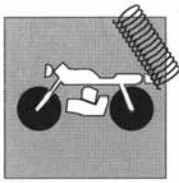


H00357

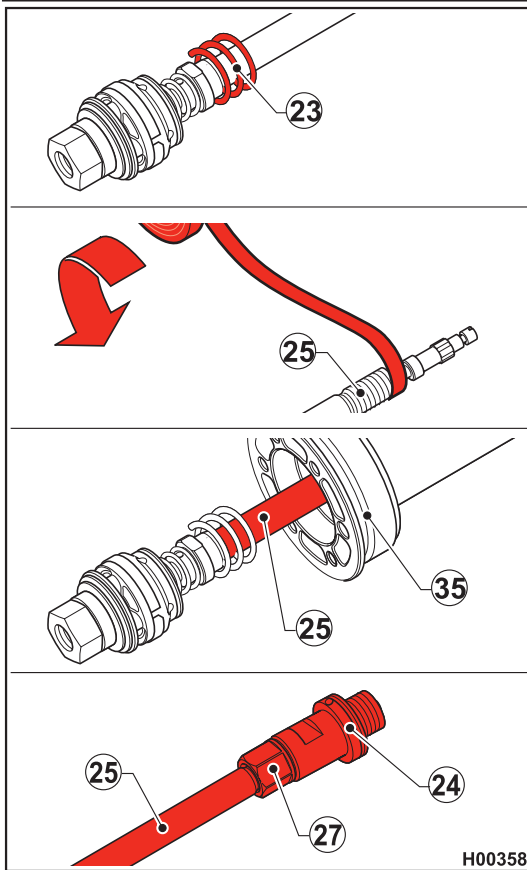


H00358





FRONT SUSPENSION



Cartridge assembly

Fit the spring (23) into place on the rod.

Apply adhesive tape over the threaded end of the rod (25). Apply one turn only, stretching the tape taut and do not overlap it.

Grease the rod and lubricate the seals.

Insert the damper rod (25) into cartridge case (35).



Both damper units are fitted with a seal; check seals for wear or damage before assembly and replace as required. Use great care and use a small flat head screwdriver to ease the damper piston into the case if needed. Piston should fit without interference.

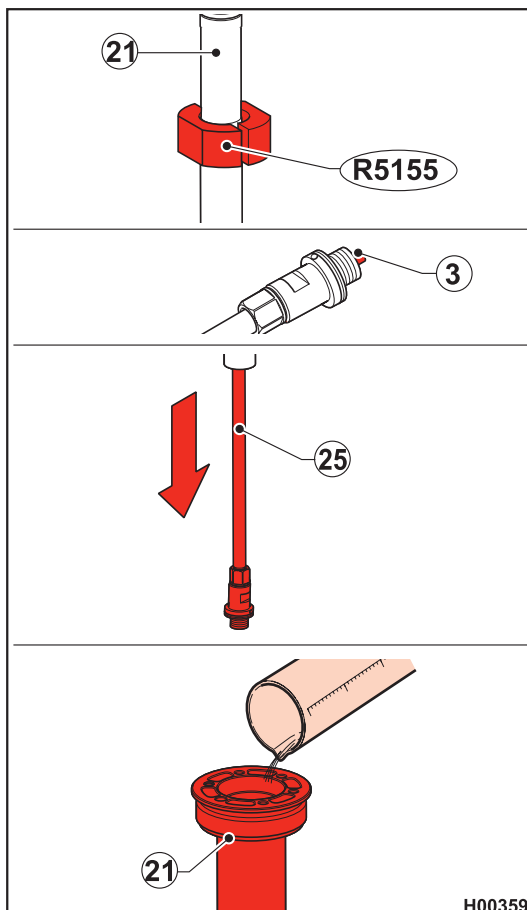
Remove the adhesive tape from rod end (25).

Turn the rebound adjuster to fully closed position (fully clockwise).

Tighten check nut (27) and rebound adjuster (24) finger tight onto the threaded end of the rod (25).

Hold the rebound adjuster (24) using a 17 mm open-end wrench and tighten the check nut (27) with another 17 mm open-end wrench to the specified torque (see Tightening Torque Figures table).

Clamp the cartridge (21) in the vice as shown in the diagram using the suitable protector (R5155).



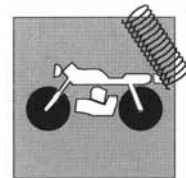
Set the rebound adjuster (3) to 15 clicks from fully closed position.

Slide the damper rod (25) fully out (fully extended).

Fill the cartridge case (21) with oil up to about 20 mm below its top edge.



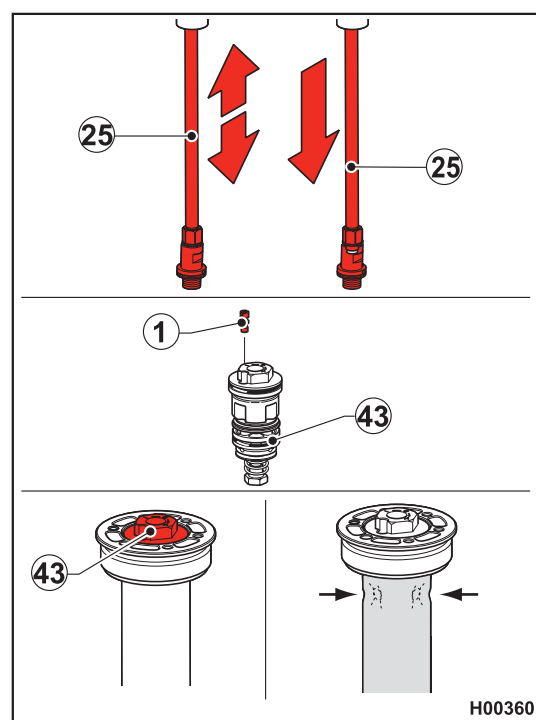
FRONT SUSPENSION



Pump the rod through its full stroke several times and top oil level up to about 20 mm below cartridge edge.

Tighten the bleed screw (1) into compression valve unit (43).

Seal cartridge end tightening the compression valve (43) and pump the rod (25) through one complete stroke. When done, you will see the bladder collapse near the 4 radial holes in the cartridge case.

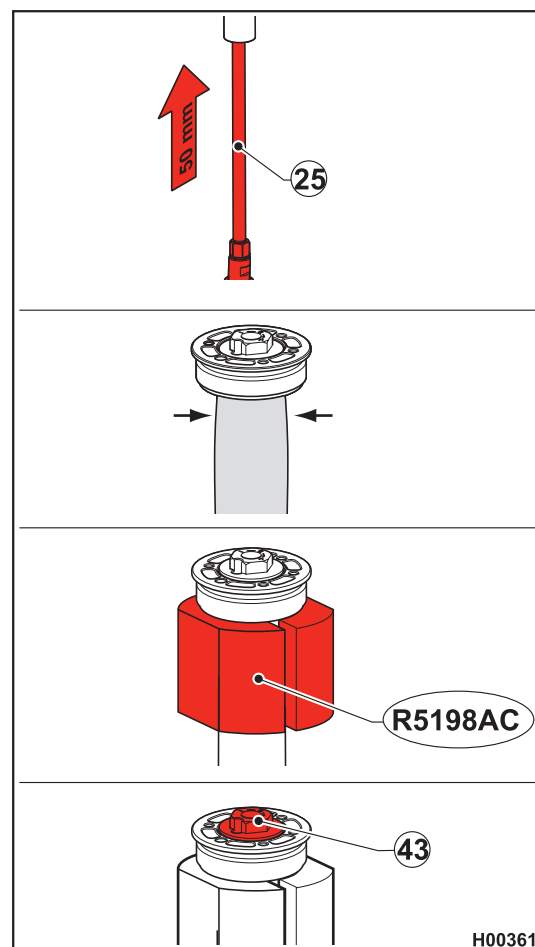


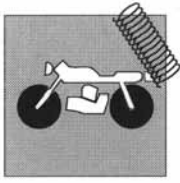
Slowly push in the rod (25) by about 50 mm, until the bladder is no longer collapsed at the four holes.

Remove the cartridge from the vice.

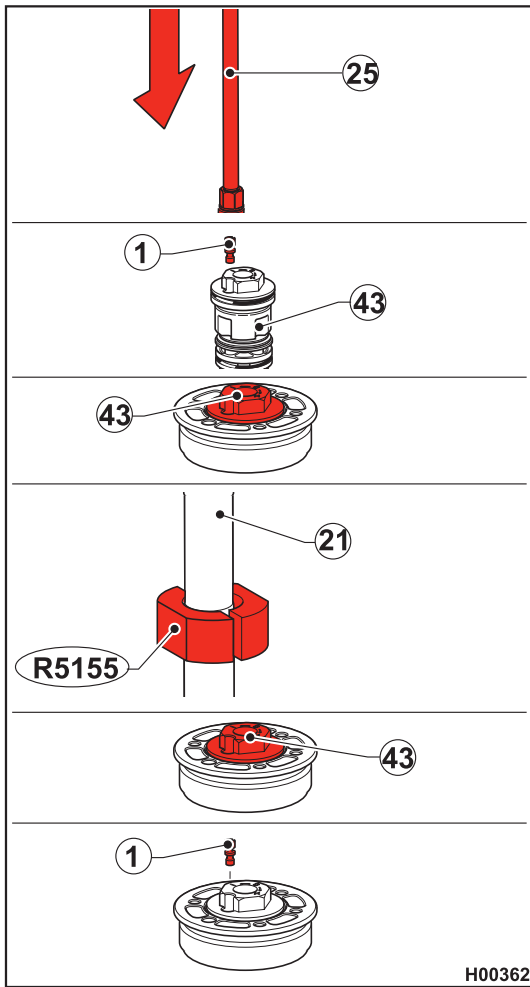
Clamp the cartridge in the vice in a vertical position using the suitable protector (R5198AC) in such a manner as to block off the 4 holes in the bladder. The jaws must contact the cap nut as shown in the figure.

Unscrew the compression valve (43).





FRONT SUSPENSION



Slide the damper rod (25) fully out (fully extended) again and top up oil up to the edge.

Set the compression adjuster to 15 clicks from fully closed position.

Loosen the oil drain screw (1) in the compression valve unit (43).

Tighten the compression valve unit until you feel the outer O-ring starting to bind inside the cap nut body.

Tighten the bleed screw to the specified torque using (see Tightening Torque Figures table).

Remove the cartridge from the vice.

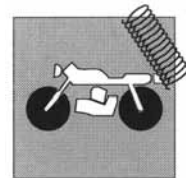
Clamp the cartridge (21) in the vice as shown in the diagram using the suitable protector (R5155).

Screw the compression valve unit all the way home and tighten to the specified torque using a 21 mm open-end wrench (see Tightening Torque Figures table).

Check for correct oil quantity.

Check as follows: pump the rod through several full strokes checking for smooth motion. Also, the rubber bladder should be swelling slightly when the cartridge is fully extended. If not so, add a few cu cm of oil and repeat the bleeding procedure. It is easy to determine whether there is not enough oil in the fork. With the cartridge fully extended, the bladder collapses near the 4 radial oil passage holes of the cartridge.

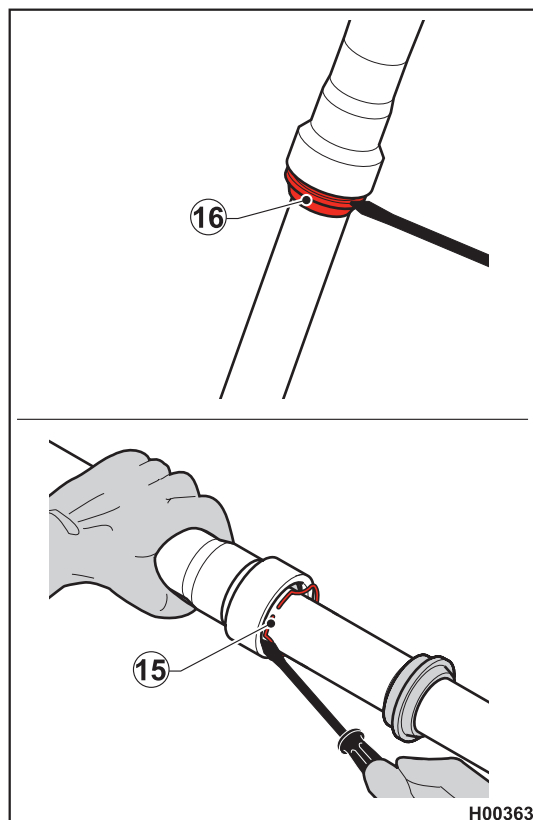




Separating inner and outer tube - sealing ring removal

Remove the dust seal (16) from its seat using a small flat head screwdriver.

Remove the metal retaining ring (15) using the same screwdriver.



Slide the inner tube (44) out of the outer tube (11); you will need to pull hard to separate the tubes.

Sealing ring (14), retainer (13) and bottom pilot bushing (12) are removed from the outer tube in the process.

Remove the top pilot bushing (46) manually.

If hard to remove, slip the tip of a flat head screwdriver into the bushing slot to aid removal.

Remove bottom pilot bushing (12), retainer (13), sealing ring (14), retaining ring (15) and dust seal (16) from the inner tube.

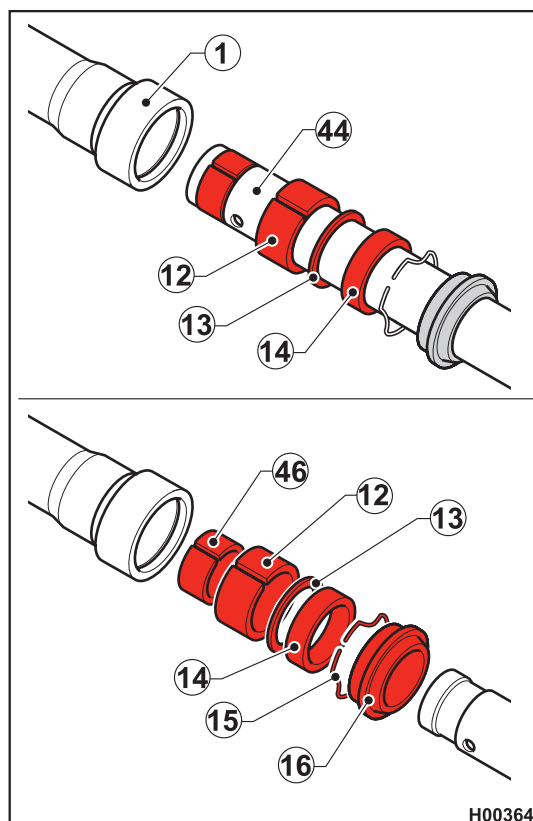


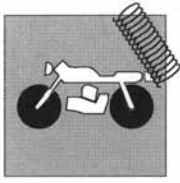
WARNING

Never reuse sealing rings and dust seals after removal.



For seal and tube assembly instructions, see paragraph 4.9.





FRONT SUSPENSION

Assembling inner and outer tube - sealing ring installation



WARNING

Never reuse sealing rings and dust seals after removal. Check the condition of the pilot bushings before assembly; replace them if scored or scratched. Make sure the Teflon® coating of the pilot bushings is in perfect condition.

Apply adhesive tape to the inner tube end to cover the top bushing seat.

Grease dust seal and sealing ring moderately.

Insert the following parts into the inner tube in the following order: dust seal (16), retaining ring (15), sealing ring (14), retainer (13) and bottom pilot bushing (12).



WARNING

The sealing ring (14) has a mounting position. Its concave end must be facing the retainer (13).

H00365

Remove the adhesive tape from inner tube end and clean off any adhesive sticking to the tube.

Insert the top pilot bushing (12) manually.



If hard to insert, slip the tip of a flat head screwdriver into the bushing slot to aid installation.

Gently fit the inner tube into the outer tube, taking care not to damage the top pilot bushing.

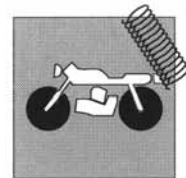
Ease the bottom pilot bushing into contact with outer tube, retainer and sealing ring.

Fit the suitable installer tool to the inner tube (44) and push the sealing ring (14) until bottom pilot bushing, retainer and sealing ring slide into place.

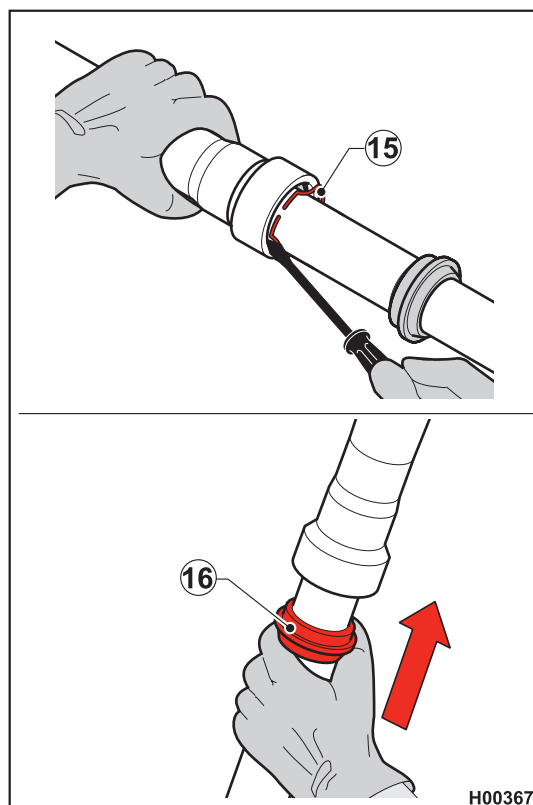
H00366



FRONT SUSPENSION



Install the retaining ring (15) using a small flat head screwdriver making sure it becomes fully seated in its groove. Be careful not to score the inner tube.



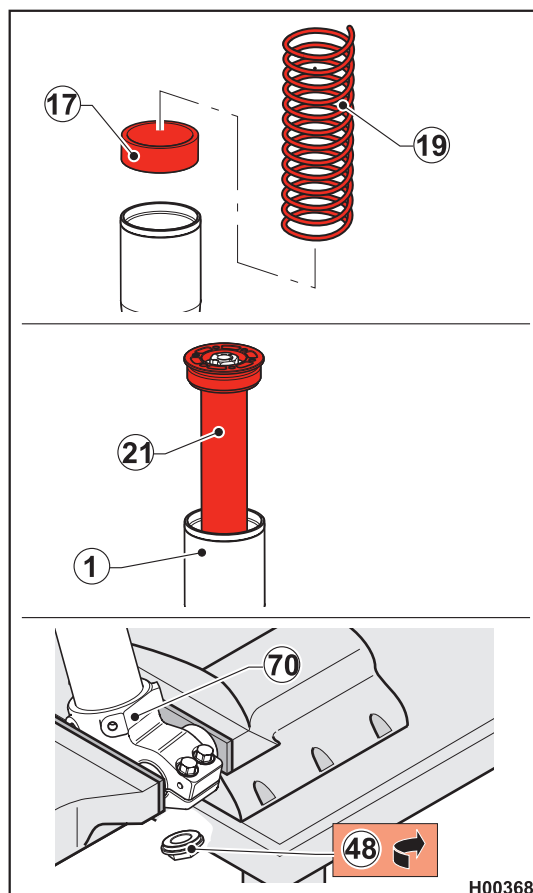
Push the dust seal (16) into place pressing with your hands.

Cartridge assembly

Insert preload spacer (17) and spring (19) into the inner tube.



Spring preload can be adjusted as described in paragraph 5.2.



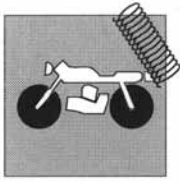
Insert the complete damper unit (21) into the outer tube (11).

Clamp the wheel axle carrier (70) in a vice.

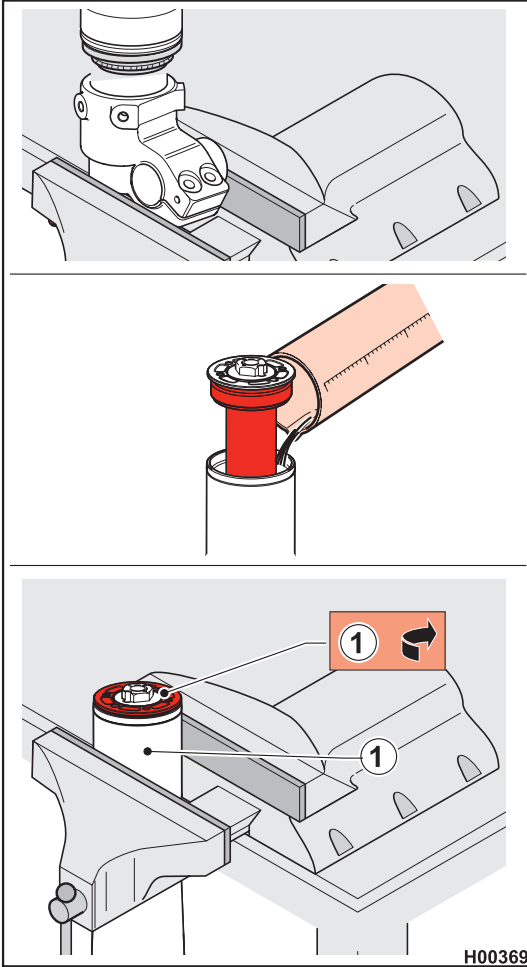
Press on the top cap nut until pushing the cartridge bottom end out of the axle carrier.

Tighten the bottom nut (48) to the specified torque using a 21 mm socket wrench (see Tightening Torque Figures table).





FRONT SUSPENSION



Oil filling.

Oil level cannot be measured. As a result, the fork must be filled with oil only after complete disassembly (see par. 4.8).

Clamp the fork leg in a vice in a vertical position.

Slide the outer tube over the inner tube up to 50 mm below the cap nut.

Prepare the quantity oil to be filled into the fork in a graduate.

OIL QUANTITY IN EACH FORK LEG:
310 cu cm

Pour the specified quantity of oil into the outer tube (11).



Using a quantity of oil or an oil type other than specified will alter fork response.

Raise the outer tube fully over the inner tube.

Tighten the cap nut (1) onto the outer tube to the specified torque (see Tightening Torque Figures table) using a 4 mm pin wrench.

Restore original settings (see page I.45).

Installing the fork on the motorcycle



WARNING

Fork installation must be in compliance with Husqvarna specifications for steering, braking system and wheel installation. Improper installation may put the safety of the rider at risk.

For correct fork operation, the wheel must be installed on the fork as follows:

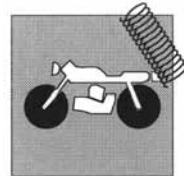
Slide the axle through right-hand axle carrier, wheel and left-hand axle carrier. Install the axle nut on the left-hand side and tighten fully.

Tighten the two left-hand carrier screws following a 1-2-1 sequence (see Tightening Torque Figures table).

Pump the forks to full travel several times.

Tighten the two right-hand carrier screws following a 1-2-1 sequence (see Tightening Torque Figures table).





Settings

Proper suspension tuning is the key to achieving optimal performance. This paragraph describes the proper setting procedure for the Marzocchi suspension.

Achieving proper tuning is a trial and error process. You will need to determine what to adjust and how.

Perform this procedure outdoors, in a low traffic area free from obstacles and potential danger.

Key considerations for optimal tuning are not limited to chassis geometry, rider weight, type of terrain and track configuration, but also include such personal factors as riding style.

As a result, standard settings may need to be adjusted to suit personal preferences and specific conditions.

When setting the suspension, work on one adjuster at a time and note any changes you make and the improvements achieved.



WARNING

Never attempt to turn the adjusters beyond their limits.

Rider sag adjustment

Rider sag (how far the suspension settles under rider's weight) is determined by the spring rate of the spring.

How to measure sag

Sag is measured as follows: Lift the front end of the motorcycle so that the wheel is off the ground. Measure the portion of leg between axle carrier and dust seal and note the measurement naming it "H1".

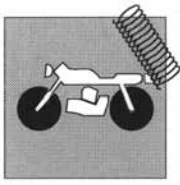
Repeat measurement with the motorcycle upright and both wheels on level ground. Note measurement and name it "H2".

$$\text{SAG} = \text{H1} - \text{H2}$$

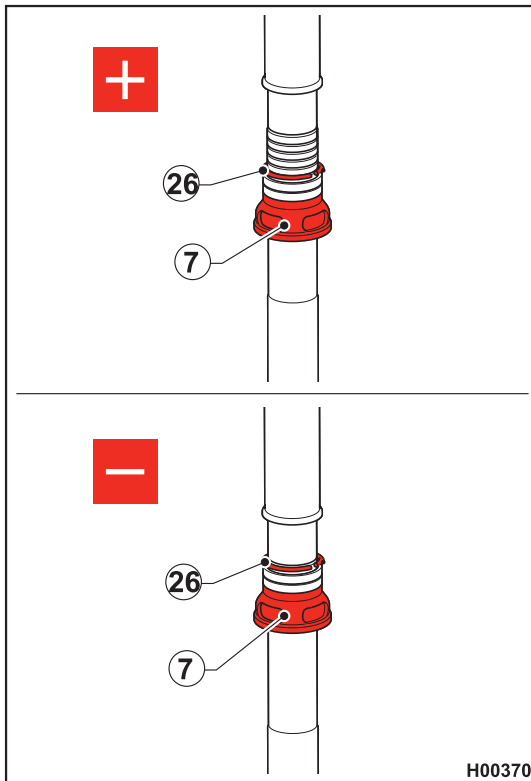
Ideal sag is 25 - 40 mm (depending on the kind of racing sport practised).

If sag is less than specified, you will need to reduce spring preload or install a softer springs in order to achieve top suspension performance. Conversely, a sag higher than specified requires lower preload or a harder spring.





FRONT SUSPENSION



Spring preload adjustment

Spring preload can be adjusted after removing the cartridge inside the fork leg (see paragraph 4.6). Closely follow the procedure outlined below:

Slide the preload adjuster (7) towards the bottom end of the cartridge so as to expose the metal ring groove.

Prise the metal ring (26) out of its groove using a small flat head screwdriver.

Placing the metal ring in a different groove will increase or decrease spring preload accordingly. Grooves are spaced to give 5 mm setting steps (see figure).



WARNING

Be careful not to damage components when removing and installing the metal ring. If the cartridge, or especially the ring groove, show even minor damage, do not use the fork and contact a Marzocchi service centre without delay. Do not distort the metal ring.

Rebound adjustment

Rebound damping is adjusted by turning the adjuster (R).

The rebound adjuster controls rebound speed after the fork is compressed.

Each fork leg has its adjuster at the bottom of the axle carrier.

Proper rebound setting improves motorcycle stability and enables the wheel to smoothly absorb bumps.



To adjust rebound damping, always start from the fully closed position (adjuster turned fully clockwise) and note the number of clicks. Each setting position is identified by a "click".

Adjust turning the adjuster with a flat head screwdriver.

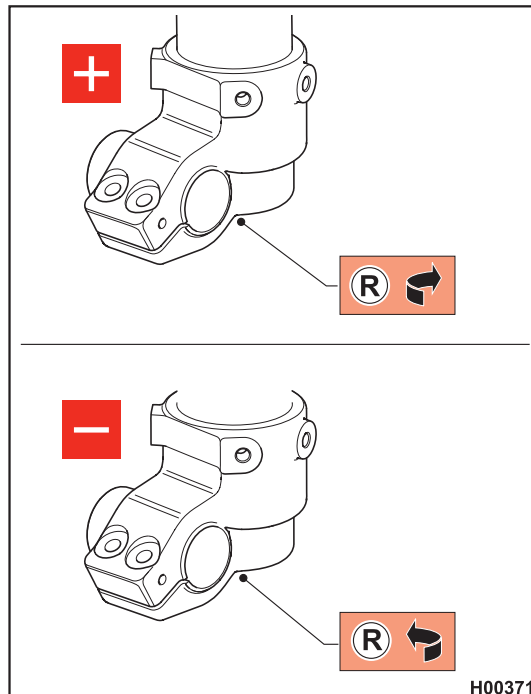
Turn the adjuster (R) clockwise to increase rebound damping for slower rebound.

Turn the adjuster (R) counter clockwise to decrease rebound damping for faster rebound.

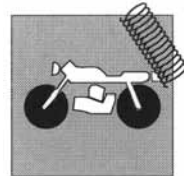


WARNING

Never attempt to turn the adjuster beyond its limit.



FRONT SUSPENSION



Compression adjustment

Compression damping is adjusted by turning the adjuster (C).



WARNING

if the fork bottoms out severely, immediately adjust compression damping or check oil level. Improper compression setting may result in fork damage, leading to accidents, and severe or lethal injury.

Hard compression setting gives more stability and faster response, enabling a more aggressive riding style; conversely, a softer setting will give less stability, which calls for a smoother riding style.



To adjust compression damping, always start from the fully closed position (adjuster turned fully clockwise) and note the number of clicks. Each setting position is identified by a “click”.

Adjust turning the adjuster with a flat head screwdriver.

Turn the adjuster (C) clockwise to increase compression damping and keep compression travel shorter when riding over a bump.

Turn the adjuster (C) counter clockwise to decrease compression damping, making for softer fork action over bumps.



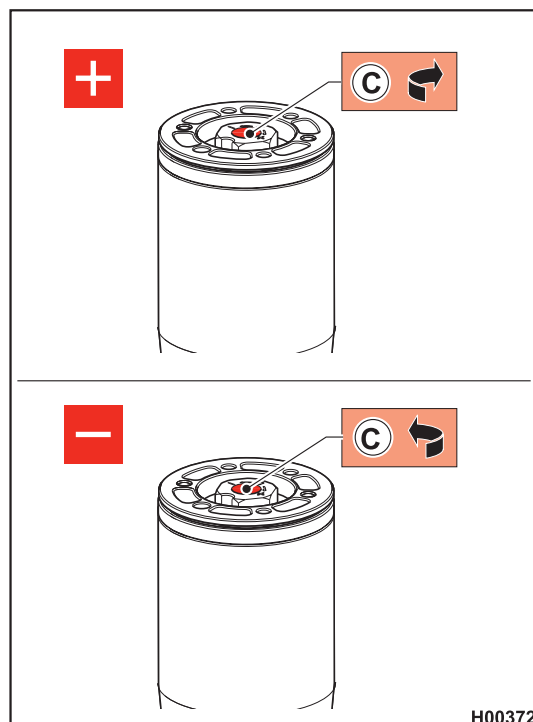
WARNING!

Never attempt to turn the adjuster beyond its limit.

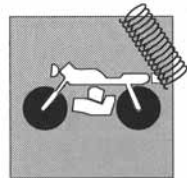
Standard settings

Compression: 15 clicks

Rebound: 15 clicks



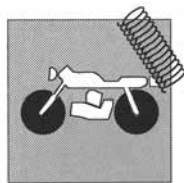
REAR SUSPENSION



Section

J



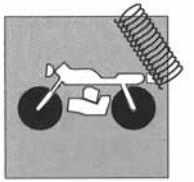


REAR SUSPENSION

Rear shock absorber	J.3
Lubrication points (grease)	J.3
Rear suspension	J.4
Rear shock absorber removal	J.5
Disassembling, servicing and assembling the rear shock absorber	J.6
Spring servicing	J.6
Shock absorber inspection	J.6
Reservoir cap with its valve removal	J.7
Piston assembly inspections	J.9
Seal replacement	J.9
Checking the setting	J.10
Reservoir replacement	J.11
Floating piston removal	J.12
Shock absorber assembly	J.12
Driving the cap onto the body	J.14
Shock absorber damping adjustment	J.15
Disassembling and servicing the swinging arm	J.16
Servicing the swinging arm shaft	J.17
Servicing the rear suspension drop drag link	J.17
Chain roller, chain guide, chain slider	J.18



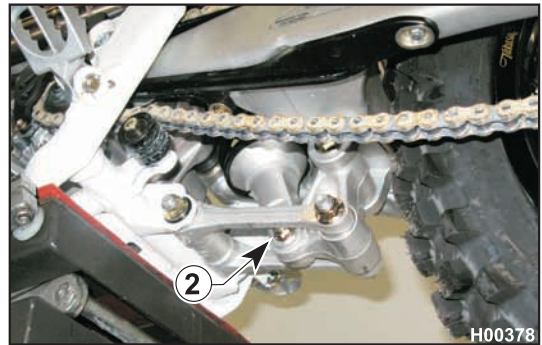
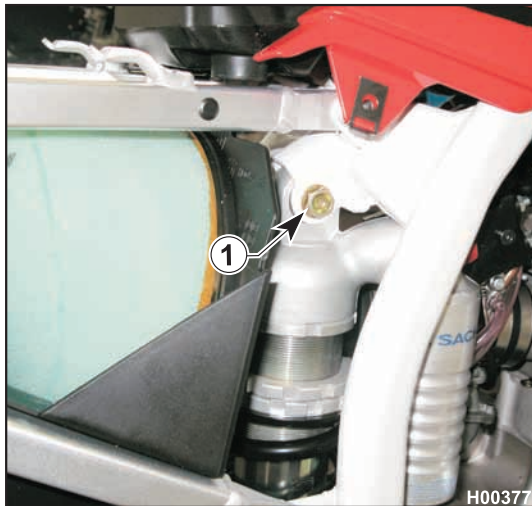
REAR SUSPENSION



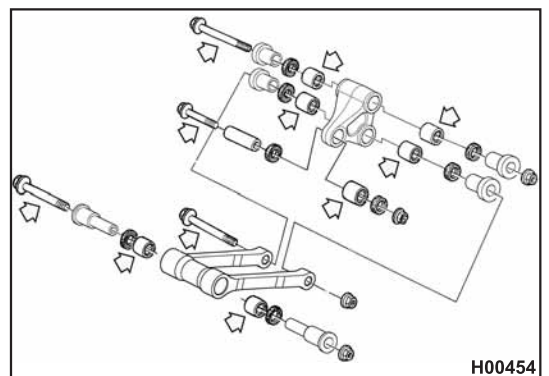
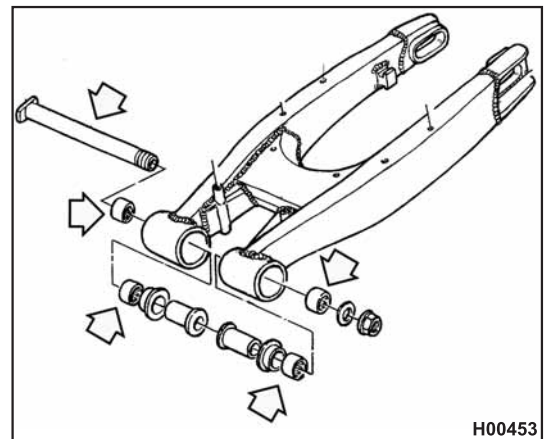
Rear shock absorber

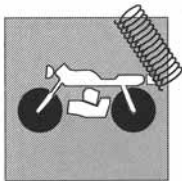
TIGHTENING TORQUE FIGURES

1, 2: 52.4 Nm/ 5.35 Kgm/ 38.6 ft/lb



Lubrication points (grease)

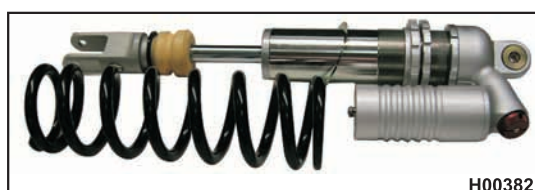




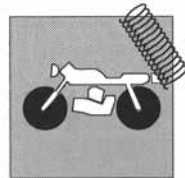
REAR SUSPENSION

Rear suspension

The rising-rate rear suspension is made up of a shock absorber, a linkage system and a swinging arm. The spring preload of the shock absorber can be adjusted to suit riding and terrain conditions. Hydraulic damping is also adjustable using outer adjuster screws. Periodically check all components for wear.



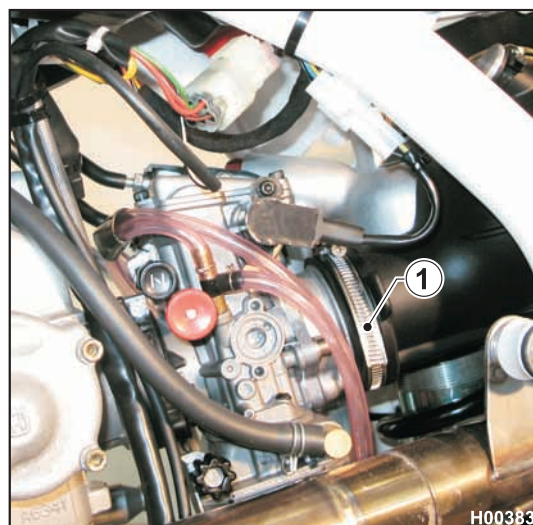
REAR SUSPENSION



Rear shock absorber removal

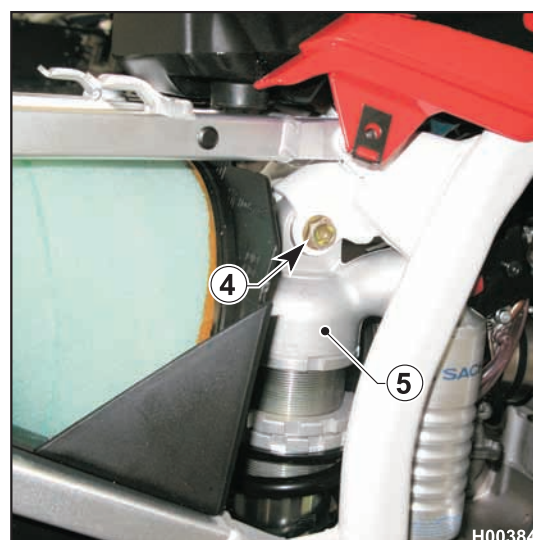
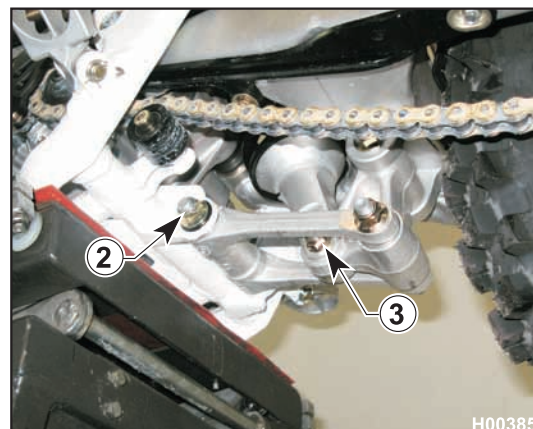
Set a block under the engine and see that the rear wheel is lifted from the ground.

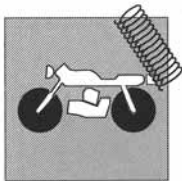
Remove saddle, side panels, silencer and rear chassis (see Section "E" - General Procedures). Loosen the front clamp (1) of the intake coupling.



Remove the front bolt (2) securing the suspension linkage to the chassis, the bottom (3) and top (4) shock absorber mounting bolts and remove the shock absorber (5).

IMPORTANT: On assembly, fit the bottom locking nut (3) of the shock absorber on the LEFT SIDE.





REAR SUSPENSION



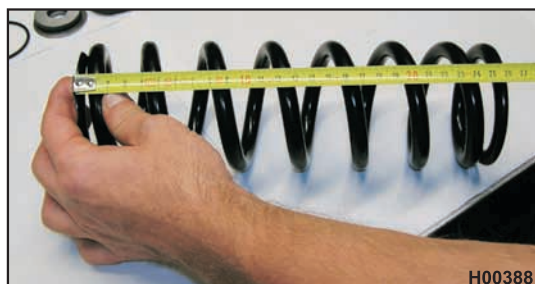
Disassembling, servicing and assembling the rear shock absorber

Clean the shock absorber before disassembly.

Spring servicing

Measure the spring in place before removal.

Spring removal: clamp the shock absorber in a vice taking care to avoid distorting it. Slacken lock ring nut and ring nut, spring retainer and spring.



Measure spring free length.

SERVICE LIMIT: $245^{+/-1.5}$ mm (SMR), $255^{+/-1.5}$ mm (TE-TXC 250),
 $255^{+/-1.5}$ mm (TE-TC-TXC 450, 510).

Change the spring if length is outside the service limit.

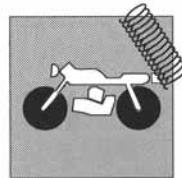


Shock absorber inspection

Visually inspect the shock absorber and look for oil leaks or other issues. Replace the shock absorber if needed.



REAR SUSPENSION



Push on the reservoir valve to discharge the gas.



Aim valve away from you to prevent any debris from getting into your eyes.



H00390

Reservoir cap and valve removal

Locate a suitable tool to reservoir cap and push down on cap until gaining access to the retaining ring.



Push down with your hand and use great care.



H00391

Prise out the retaining ring using two small screwdrivers. Take care not to damage the inner surface.

To remove the retaining ring, first prise one end of the ring out of its groove. Then slide out the other end, slip the tip of a screwdriver between ring and reservoir and prise off with the other screwdriver. Take out the retaining ring. Check the grooves in reservoir body for burrs. If any burrs are detected, they must be removed and the grooves must be reconditioned.

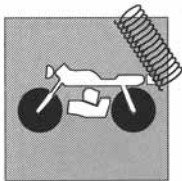
Screw a pipe with inner thread onto the cap and extract the cap using pliers.



H00392



H00393



REAR SUSPENSION



Place the shock absorber on a bench. Unscrew or knock out the cover (depending on the model).

H00394



Once the tank cap is removed, push the rod guide down into the body so as to expose the circlip groove and remove the circlip with a screwdriver.

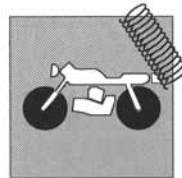
H00395



H00396



REAR SUSPENSION



Clamp the top section of the shock absorber in a vice with aluminium or bronze jaws. Insert a rod or a screwdriver into the mounting hole and extract the rod guide and piston assembly from the shock absorber body. Before extracting the assembly, cover the end of the shock body with a cloth to capture leaking oil.



Keep the shock absorber in the vice taking in nearly vertical position. If you drain the oil, you will need to replace the reservoir floating piston. Pour the oil into a clean pan and leave it to settle.



H00397

Piston assembly inspections

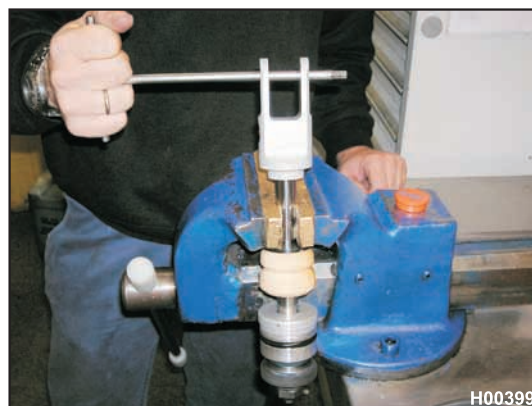
- 1) Check the seal for wear or damage (replace if worn or damaged)
- 2) Check the O-ring on the rod guide. Replace if scored.
- 3) Check the surface of the chrome-plated rod for dents or scoring. If any damage is found, seal and DU bush will be damaged as well and you will need to replace the rod guide, too. (Rod, rod guide and clevis are supplied as a set).



H00398

Seal replacement

If you need to replace the seal, unscrew the clevis, slide off the rod guide and fit a new seal. Reassemble and refit the clevis securing it with Loctite and tightening to 50 Nm (5 kgm; 36.9 ft/lb).

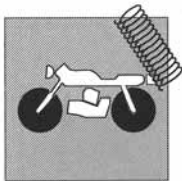


H00399



H00400





REAR SUSPENSION



Checking the setting

If the suspension is not operating properly and you need to adjust compression damping, loosen the knob dowel (heat with an air gun before loosening).

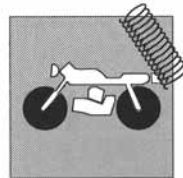


Proceed as follows:

loosen the ring nut with the suitable key, slide off all parts noting their positions to ensure correct assembly.



REAR SUSPENSION



After the inspection, refit piston, disc, spring and slotted ring. Slide the needle shaft off the cap, tighten the ring, insert into slot pressing lightly and secure in place tightening the cap to 30 Nm (3 kgm; 29.2 ft/lb).



H00406



It is strictly forbidden to change the compression washers. This could cause the shock absorber to explode while in service.



H00407

Reservoir replacement

In the event the reservoir needs to be replaced, heat the area near the threaded end with an air gun and loosen using suitable equipment.



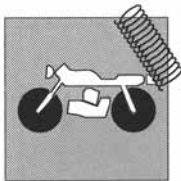
H00408

Replace the reservoir O-ring. Grease the O-ring being careful not to smear the thread in the mount.



H00409





REAR SUSPENSION



H00408

Apply Loctite and screw on the reservoir being careful not to damage the O-ring. Tighten to 40 Nm (4 kgm; 39.2 ft/lb).

NOTE: Perform these procedures in a clean environment and clean any components to be reused.

Floating piston removal

If you have drained the shock oil, you will need to remove the floating piston. Extract the floating piston using pliers and be careful not to score the reservoir. Replace the reservoir if it shows any surface damage.



H00410

Shock absorber assembly

Wash the shock absorber body thoroughly with a degreasing product. Make sure it is fully dry. Blow with compressed air if needed.

Clamp the shock absorber eye in a vice with aluminium or bronze jaws (or use a shop rag to protect the eye). Fill 70-80 cu cm (4.3-4.9 cu. in.) of oil into the shock absorber body. Insert the complete piston rod into the shock absorber body, taking care not to damage the sliding surface; push rod with piston and mount, but leave a gap to top up with oil later.

Fit a new O-ring to the floating piston (always use a new O-ring after removal). Fill the reservoir with oil, then quickly insert the floating piston into the reservoir (see picture).



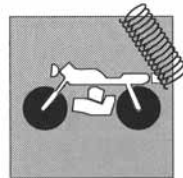
H00411



H00412



REAR SUSPENSION



Push the floating piston quickly down to reservoir bottom while holding the rod steady in the appropriate position for top-up. The oil inside the reservoir will flow into the shock absorber body and fill it up to a certain level as it seeps through the piston washers. These operations need to be performed quickly to avoid the ingress of air.



H00414



H00413

Top up with oil up to nearly 2 cm (0.8 in.) below shock body edge. Pump the rod up and down through 5 - 6 cm (2-2.4 in.) strokes four or five times to expel any air trapped under the piston.



Pump slowly or the floating piston might become displaced due to cavitation or compression. Top up with oil up to the circlip groove, while slowly setting the rod so the bumper is level with the groove.



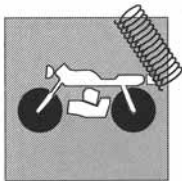
H00415

Hold the rod steady and slide the rod guide into the shock absorber cylinder. Push the rod guide down into the body past the circlip groove. Insert the circlip making sure it is securely in place. Pull the rod upwards to bring the rod guide in working position.



H00416





REAR SUSPENSION



H00417

Refit the reservoir cap with its valve. Fit it into the reservoir and fit the circlip into the groove.

Fill nitrogen (or air) through the valve and pressurise to 10-12 bar. Refit the cap to the valve and check for oil or air leaks.

Drive the cap onto the body.

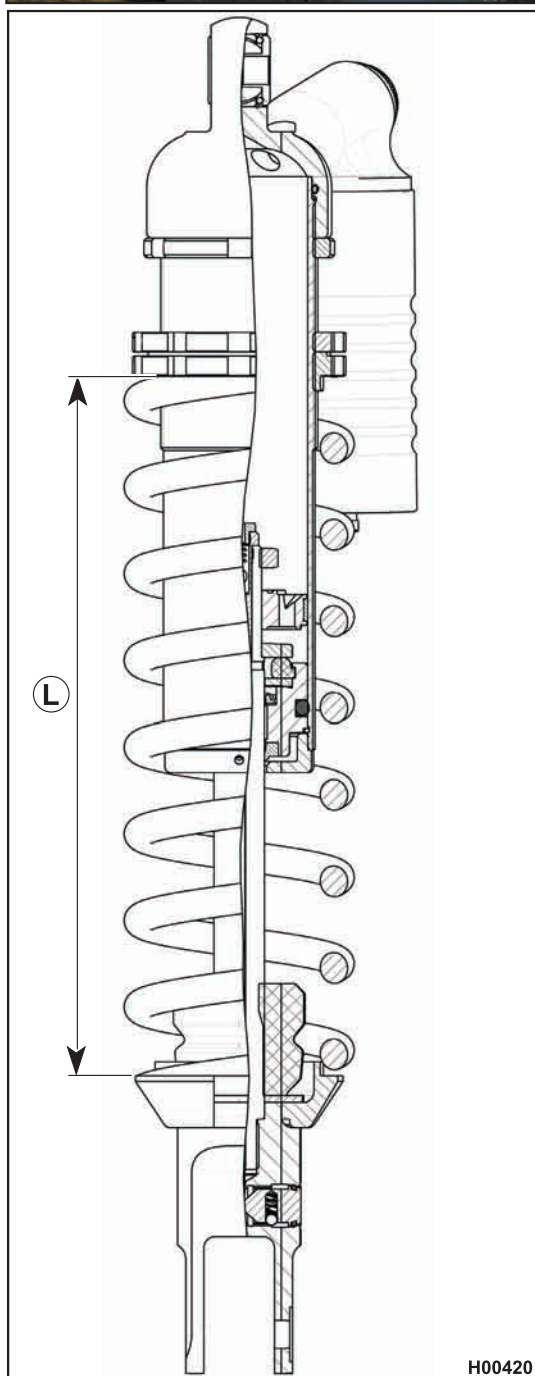
Refitting bumper and washer.

If you have replaced the bumper, clamp the rod in a vice with bronze or aluminium jaws, apply Loctite to the mount and tighten to about 50 Nm. Refit the spring and set to initial preload using ring nut and lock ring nut.



All liability is disclaimed for any damage resulting from procedures other than those described in this manual.

L = 248.5-251.5 mm (9.78-9.90 in.)



H00420



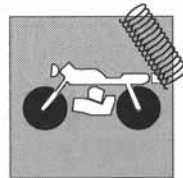
H00418



H00419



REAR SUSPENSION



Shock absorber damping adjustment

Adjustment of the compression stroke is independent from the rebound stroke.

A) COMPRESSION - Standard setting:

- 1) Low damping speed:
-15 clicks (± 2 clicks)
(adjuster screw 1)
- 2) High damping speed:
-15 clicks (± 2 clicks)
(adjuster screw 3)

To reset the standard setting, turn upper adjuster screws (1) and (3) clockwise until reaching fully closed position. Then turn them back the number of clicks specified above.

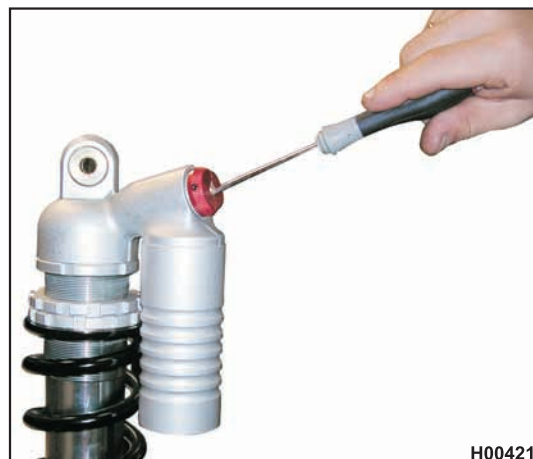
In order to obtain a smooth braking action, turn the adjuster screws counter clockwise. Vice versa to obtain a harder braking action.

B) REBOUND - Standard setting:

- 18 clicks (± 2 clicks)

To reset the standard setting, turn lower adjuster screw (2) clockwise until reaching fully closed position. Then turn it back by the mentioned clicks.

In order to obtain a smooth braking action, turn the adjuster screw counter clockwise. Vice versa to obtain a harder braking action.



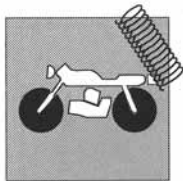
H00421



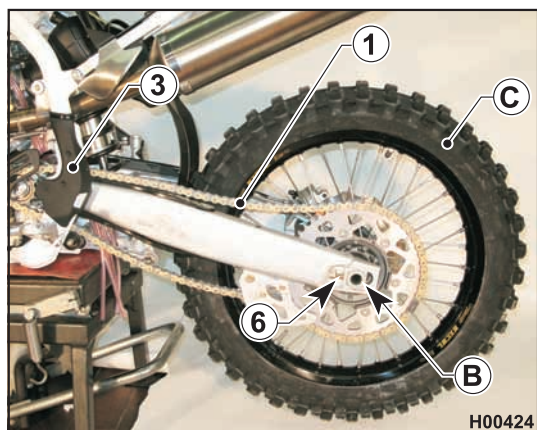
H00422



H00423

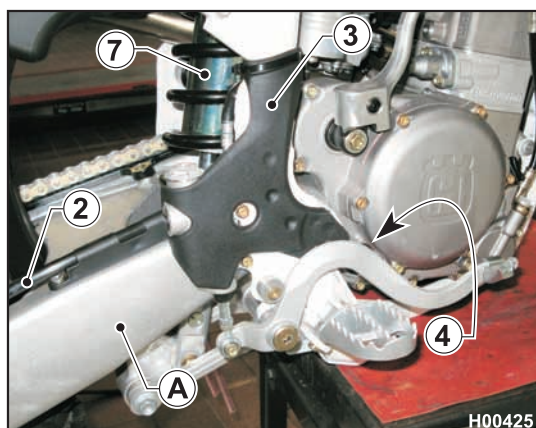


REAR SUSPENSION



Disassembling and servicing the swinging arm

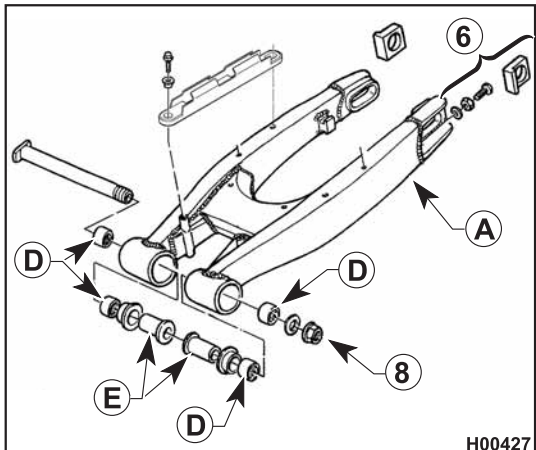
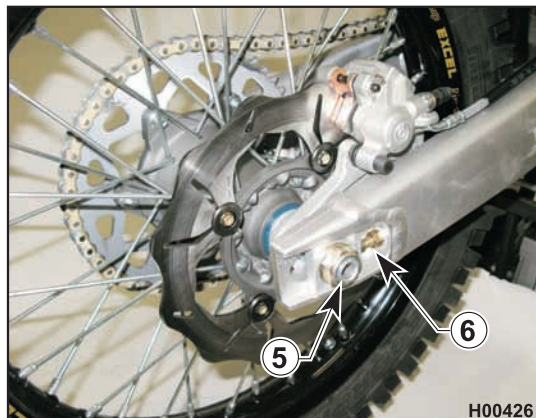
Set a stand or a block under the engine and see that the rear wheel is lifted from the ground. Remove the secondary drive chain (1) and detach the rear brake line (2) from the swinging arm (A). Remove both chassis side guards (3). Disengage the return spring (4) of the rear brake pedal from the chassis. Remove the wheel axle nut (5) and the wheel axle (B). There is no need to loosen the chain tensioners (6) on the swinging arm; in this way, the chain tension will remain unchanged after reassembly. Extract the complete wheel (C), keeping the spacers located at the hub sides. Remove the shock absorber (7) as described at page J.3. Remove the swinging arm shaft nut (8) and then the swinging arm. Check swinging arm straightness and manually check the roller cages (D) and their bushings (E) for wear; turn the bushing inside the roller cage: if you feel any tightness or hear noise, replace them.



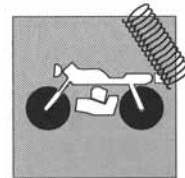
TIGHTENING TORQUE FIGURES

5 = 142,1 Nm - 14,5 Kgm - 104,81 ft/lb

8 = 122,5 Nm - 12,5 Kgm - 90.3 ft/lb (+LOCTITE 243)



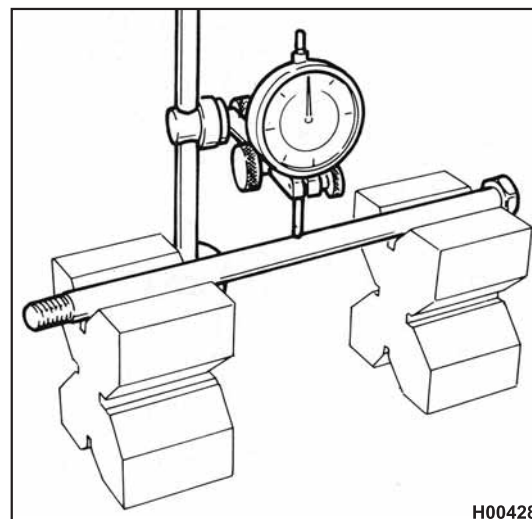
REAR SUSPENSION



Servicing the swinging arm shaft

Check shaft taper using a dial gauge. Place the shaft on two identical reference blocks. Turn the shaft and move the dial gauge horizontally to determine the amount of distortion.

Service limit: 0.30 mm.



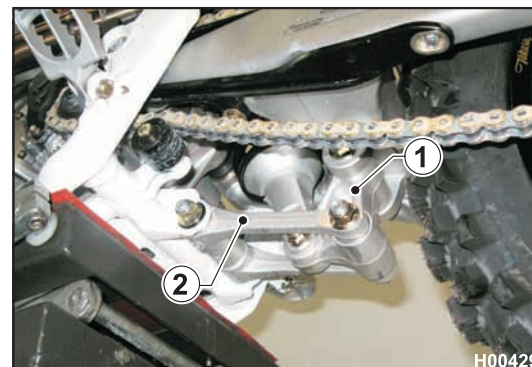
H00428

Servicing the rear suspension drop and drag link

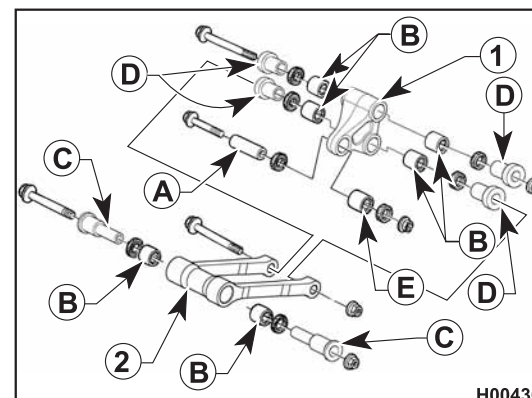
With drop link (1) and drag link (2) still in place (connected to swinging arm and chassis, respectively), rock them both back and forth in all directions to check for radial and axial clearance. Some axial clearance in the drop drag link is required for the swinging arm to achieve the ideal position for proper operation. If any radial clearance is detected, remove the part from swinging arm or chassis and check inner spacer (A) and (E), bushings (C), (D) and bearings (B) for wear.



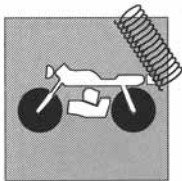
Grease the inner race of the bearings before refitting them.



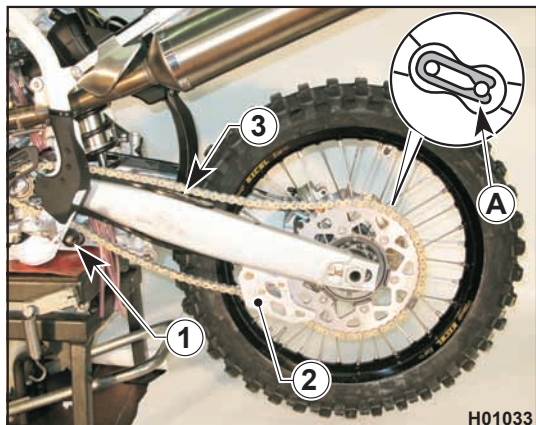
H00429



H00430



REAR SUSPENSION



Chain roller, chain guide, chain slider

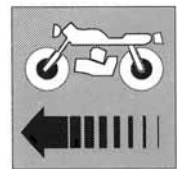
Check the wear of the above-mentioned elements and replace them when necessary.



Check the chain guide alignment, and remember that a bent element can cause chain early wear. In this case, chain might unwrap from the sprocket.

- 1 Chain roller
- 2 Chain guide
- 3 Chain slider
- a Master link clip

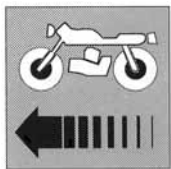
BRAKES



Section

L



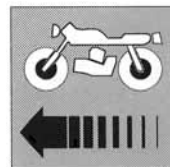


BRAKES

Braking system.....	L.3
Brake disc.....	L.4
Checking brake pads for wear / replacing the pads	L.5
Bleeding the front braking system.....	L.6
Bleeding the rear braking system.....	L.7
Changing the fluid.....	L.8



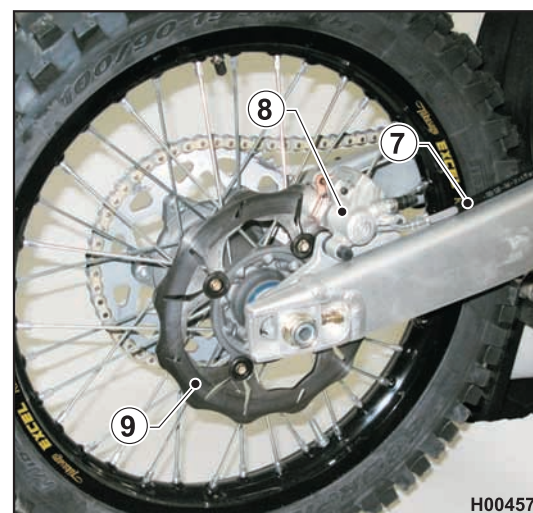
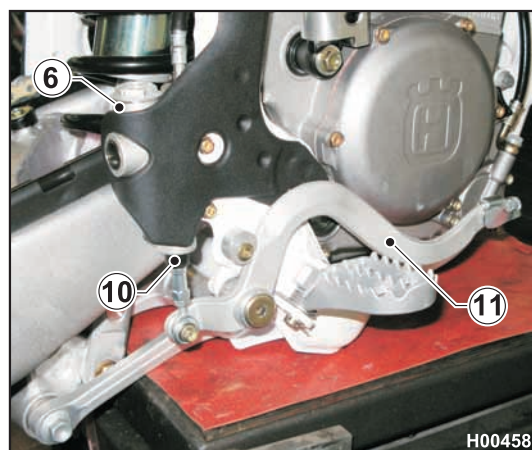
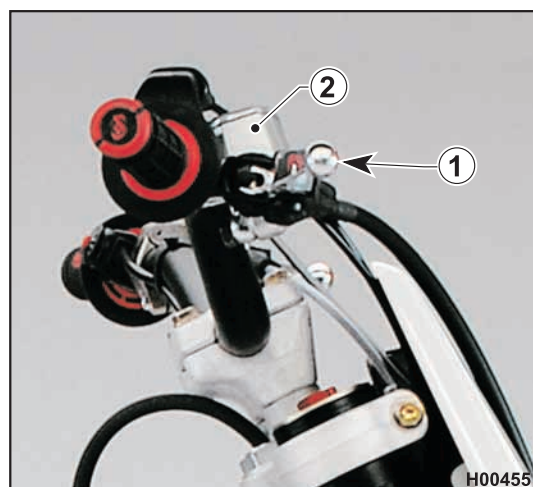
BRAKES

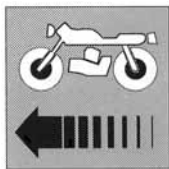


Braking system

The braking system uses two independent circuits. Each system is equipped with a brake calliper connected to a master cylinder with a fluid reservoir.

1. Front brake lever
2. Front brake master cylinder with fluid reservoir
3. Front brake line
4. Front brake calliper
5. Front brake disc
6. Rear brake fluid reservoir
7. Rear brake line
8. Rear brake calliper
9. Rear brake disc
10. Rear brake master cylinder
11. Rear brake control pedal





BRAKES



Brake disc

Checking the brake disc is an important safety procedure; the disc must be spotless, i.e. free from corrosion, oil or other dirt or deep scoring.

Front brake disc diameter: 260 mm

Front brake disc thickness (when new): 3.0 mm

Wear limit: 2.5 mm

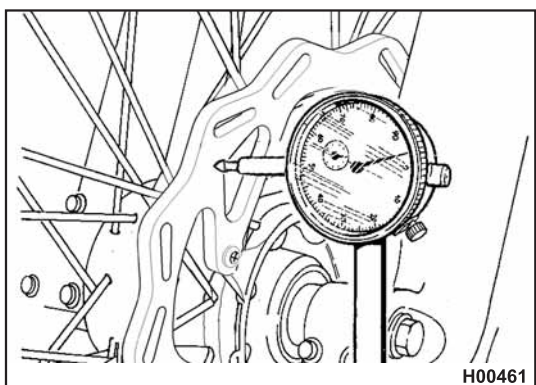
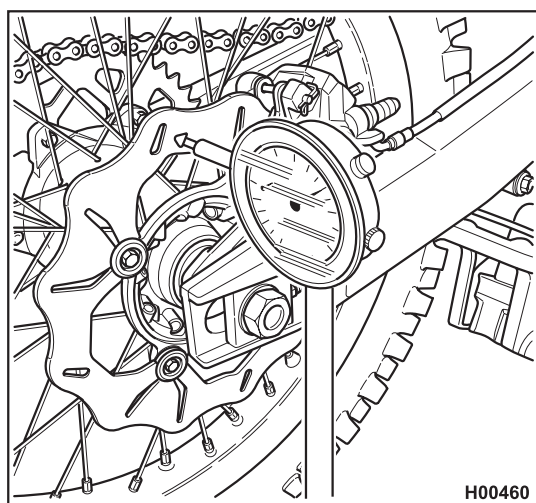
Rear brake disc diameter: 240 mm

Rear brake disc thickness (when new): 4.0 mm

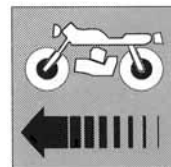
Wear limit: 3.5 mm

Disc warpage must not exceed 0.15 mm (check disc mounted on the rim with a dial gauge).

To remove the disc from the wheel rim, you need to loosen the four retaining screws. On assembly, clean all mating surfaces thoroughly and tighten the screws to the specified torque.



BRAKES



Checking brake pads for wear / replacing the pads

Check brake pad wear.

Service limit "A"

- 3.8 mm (front and rear pads)

If service limit is exceeded, always replace the pads in pairs.

Be careful that no brake fluid or any oil gets on brake pads or discs. Clean off with alcohol any fluid or oil that inadvertently gets on the pads or disc.

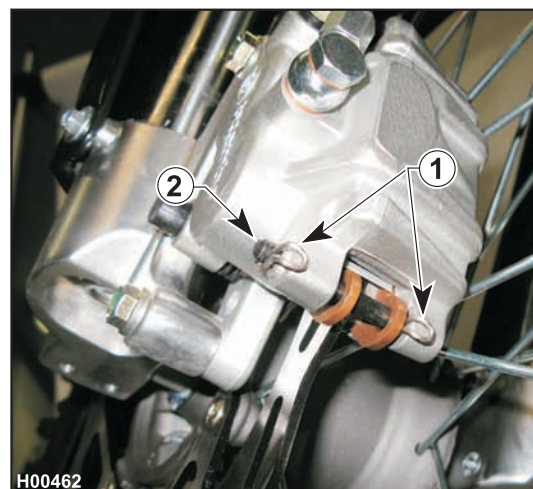
Replace the pads with new ones if they cannot be cleaned satisfactorily.

PADS REMOVAL

- Remove clips (1).
- Slide out pins (2).
- Remove pads.



Do not work the brake lever or pedal while removing the pads.



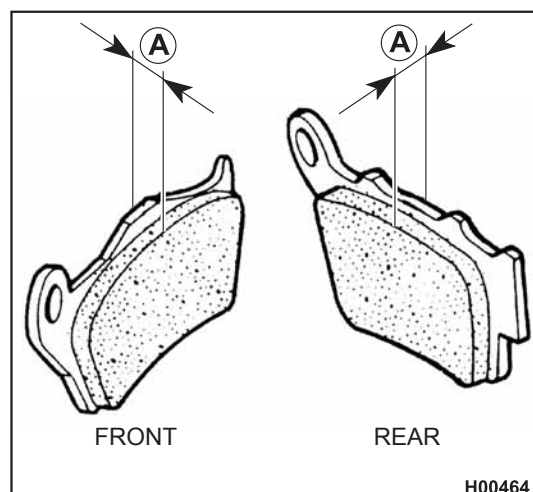
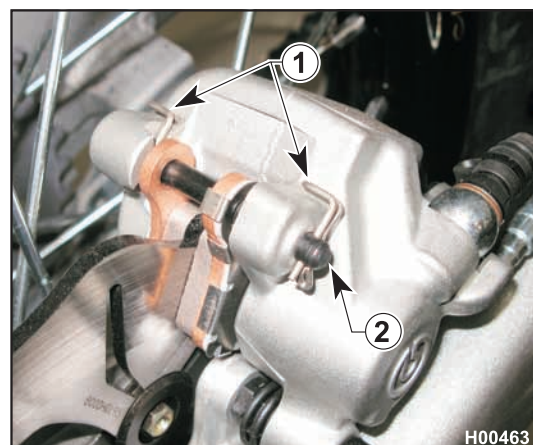
PADS INSTALLATION

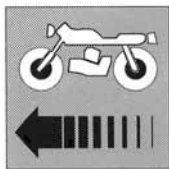
- Install new brake pads.
- Reassemble the two pins (2) and the clips (1).

The above procedure eliminates the need to bleed the braking system after replacing the pads. Simply operate the control lever several times until bringing the pistons back to their normal position.

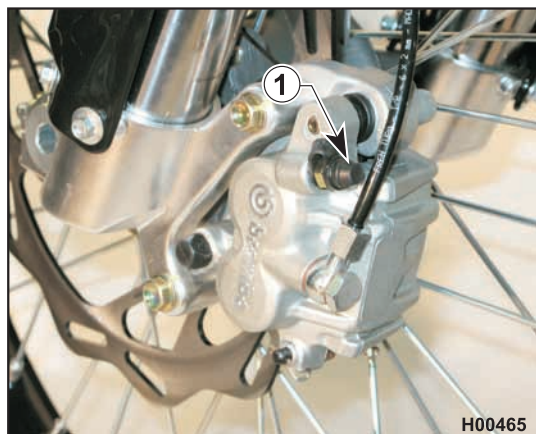


Drain some fluid from the reservoir when replacing the pads, or the pistons backing up into the cylinders might cause fluid to spill out of the reservoir.





BRAKES

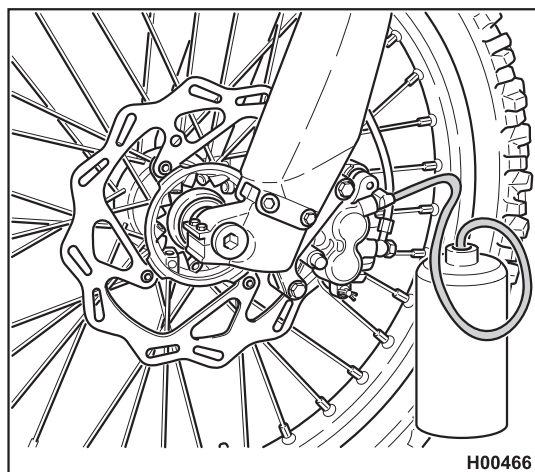


Bleeding the front braking system

A long travel and mushy feel of the brake lever indicate that there is air in the system and the brake needs bleeding.

Bleeding procedure is as follows:

- Take the rubber cap off the bleed valve (1).
- Attach a clear plastic hose to the calliper bleed valve and place the other end of the hose in a vessel (make sure the hose end stays dipped in the fluid throughout the procedure).
- Remove the reservoir plug (2) and the rubber gaiter and fill fresh fluid into the reservoir.
- Slacken the bleed valve and operate the lever (3) repeatedly until the fluid flowing out of the hose looks clear and free of air bubbles: now tighten the bleed valve.
- Top up fluid level (A) and refit rubber gaiter and reservoir cover (2).



Fluid level inside the reservoir shall never drop below the minimum notch during the bleeding procedure.



Brake fluid is corrosive. In the event of contact with eyes, rinse with abundant water.



Motorcycle handlebar must be turned to the left during the bleeding procedure. This will keep the master cylinder reservoir higher, making bleeding easier.



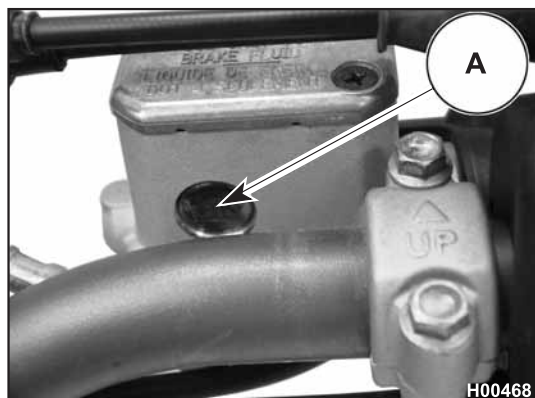
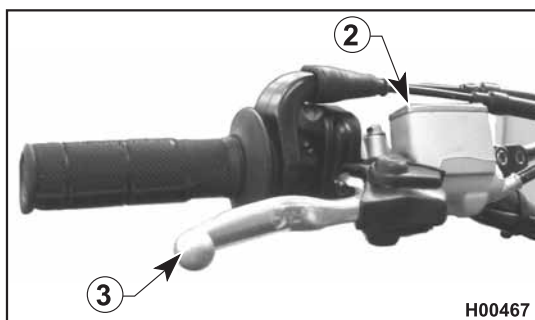
The bleeding procedure does not remove all air from the circuit; any small amounts of air left in the circuit will disappear after a short period of usage; this will eliminate the mushy feel of the lever and restore its travel to proper length.



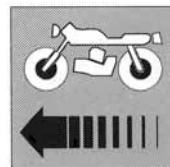
If brake lever or brake pedal feel mush after a fall or a repair resulting in loss of braking, bleed the circuit as described above.



Bleed valve tightening torque: 12-16 Nm, 1.2-1.6 Kgm, 8.8-11.8 ft/lb.



BRAKES

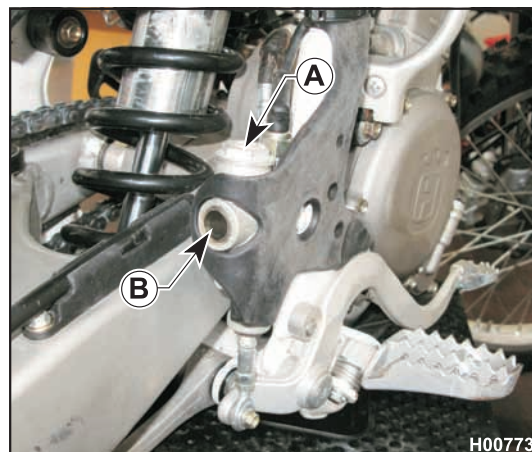


Bleeding the rear braking system

A long travel and mushy feel of the brake pedal indicate that there is air in the system and the brake needs bleeding.

Bleeding procedure is as follows:

- Remove reservoir cap (A) (21 mm wrench) and diaphragm and fill with fluid (DOT 4).
- Attach a clear plastic hose to the calliper bleed valve (1) and place the other end of the hose in a vessel.
- Press the pedal (2) fully down.
- Loosen the bleed valve and drain the fluid (only air at first), then slightly close the valve.
- Release the pedal and wait a few seconds. Repeat the process until you see only fluid coming out of the hose.
- Tighten the bleed valve to the specified torque and check fluid level (B) in the reservoir before refitting the cap (A). If the bleeding procedure was performed correctly, the pedal will no longer have that mushy feel. If not so, repeat the procedure.



H00773



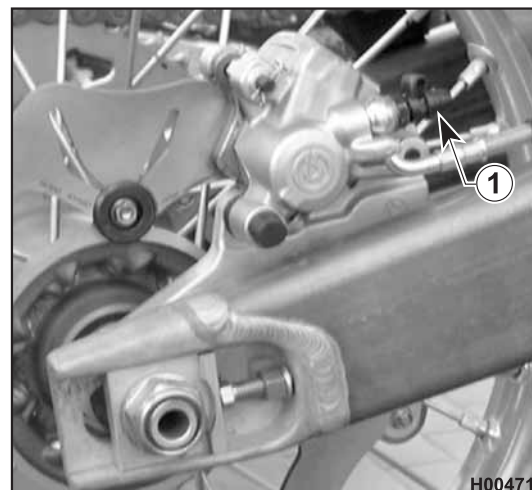
Fluid level inside the reservoir shall never drop below the minimum notch during the bleeding procedure.



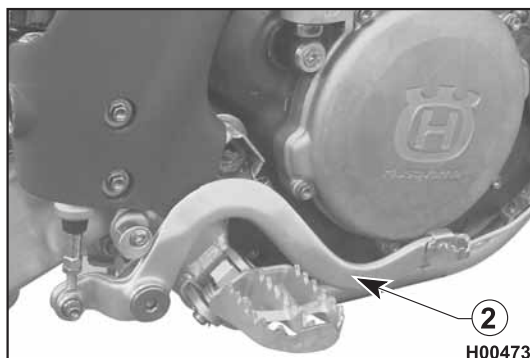
If brake lever or brake pedal feel mush after a fall or a repair resulting in loss of braking, bleed the circuit as described above.



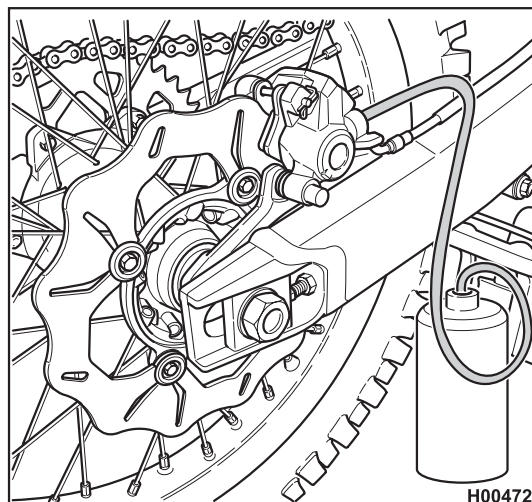
Bleed valve tightening torque: 12-16 Nm, 1.2-1.6 Kgm, 8.8-11.8 ft/lb.



H00471

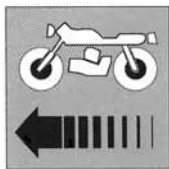


H00473

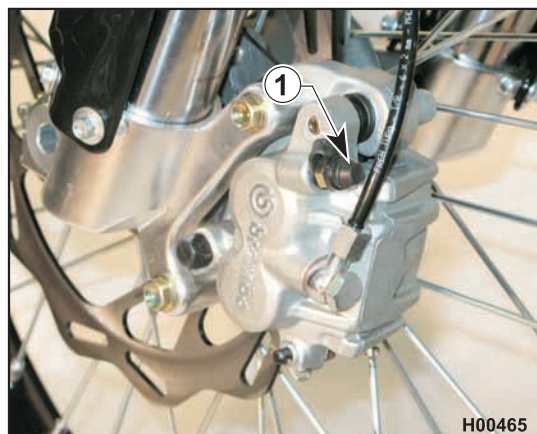


H00472





BRAKES



Changing the fluid

Brake fluid should be checked and changed as per the "Maintenance Chart" (see Section B), or earlier if contaminated with debris or water.



Do not change brake fluid in the rain or with a strong wind.



Use only fluid taken from a sealed container (DOT 4). Never reuse brake fluid.



Avoid the ingress of contaminants such as dirt, water, etc. into the reservoir.



Do not keep the reservoir open without its cover longer than necessary; this would increase the risk of contamination.



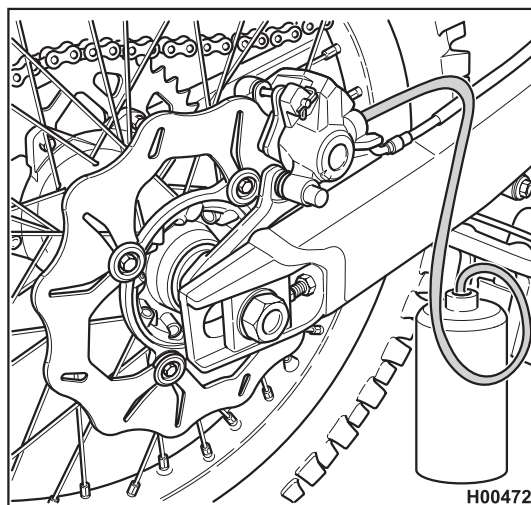
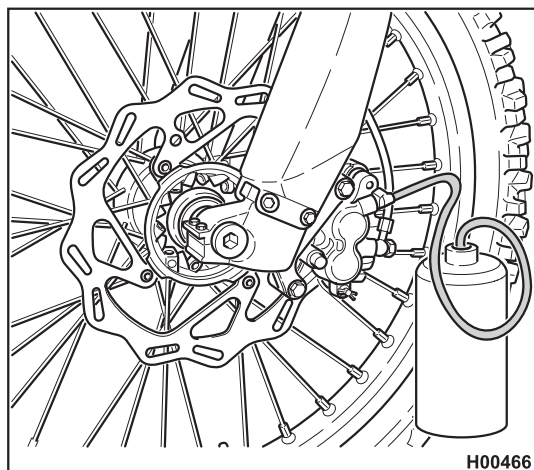
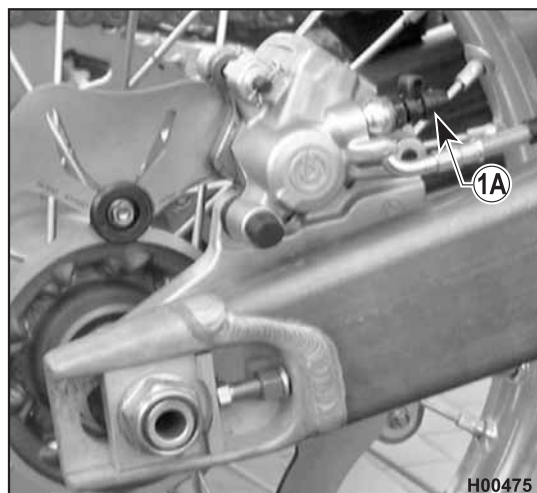
Handle the fluid with care to avoid damage to painted parts.



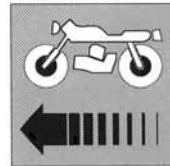
Do not mix two brands of fluid. This would reduce boil-over point, leading to loss of braking efficiency or degrading of rubber parts.

Replacement procedure is as follows:

- Take the rubber cap off the bleed valve (1) or (1A).
- Attach a clear plastic hose to the calliper bleed valve and place the other end of the hose in a vessel.

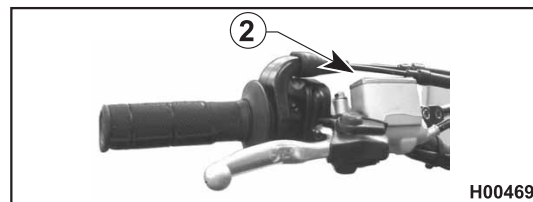


BRAKES

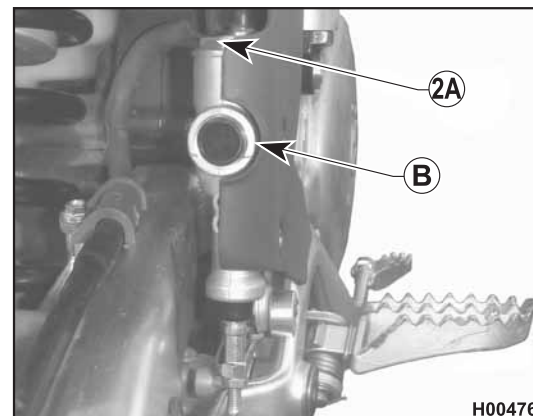


- Remove the reservoir cap (2) or (2A) 21 mm wrench and the rubber gaiter.
- Loosen the bleed valve on the calliper.
- Pump the brake lever (3) or the brake pedal (3A) until draining all fluid.
- Tighten the bleed valve and fill the reservoir with fresh fluid.
- Loosen the bleed valve, operate lever or pedal, tighten the valve keeping lever or pedal pressed and then release quickly.
- Repeat the process until the circuit is full and you can see clear fluid coming out of the plastic hose: now tighten the bleed valve.
- Top up with fluid up to level (A) or (B) and refit rubber gaiter and reservoir cover.

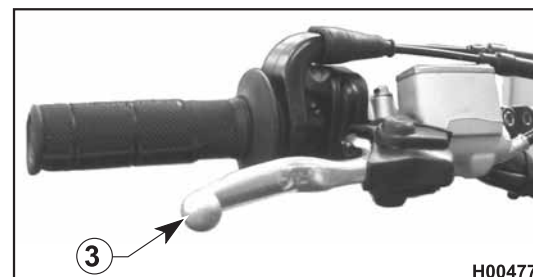
After changing the fluid, you will need to bleed air from the circuit.



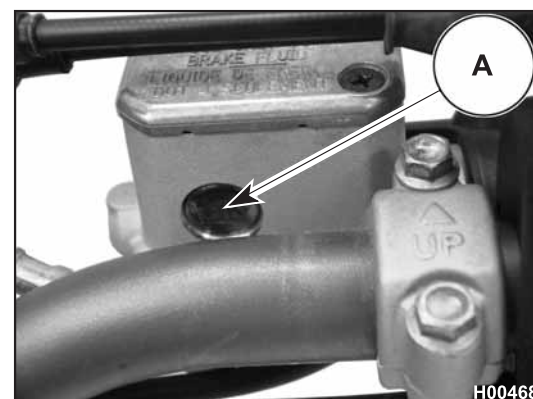
H00469



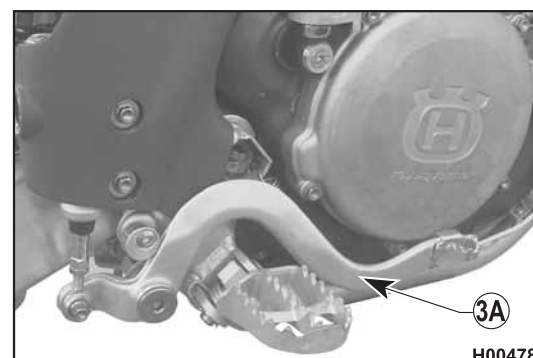
H00476



H00477

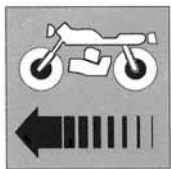


H00468



H00478





BRAKES



H00479

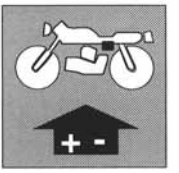
Periodically check the connecting hoses (C) and (D) (see Scheduled Maintenance Chart, Section B); replace worn or cracked hoses.



H00480



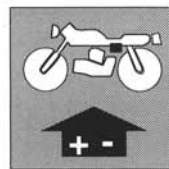
ELECTRICAL SYSTEM



Section

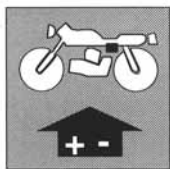
M





Wiring diagram (TC)	M.5
Key to wiring diagram	M.5
Colour coding key	M.5
Wiring diagram (TE)	M.6
Key to wiring diagram	M.6
Colour coding key	M.6
Wiring diagram (TXC)	M.7
Key to wiring diagram	M.7
Colour coding key	M.7
Electrical components location (TC)	M.8
Electrical components location (TE)	M.9
Electrical components location (TXC)	M.13
Checking generator stator windings resistance	M.16
Generator no-load performance (TC)	M.17
Generator performance (TE-TXC)	M.17
Ignition system (TC)	M.18
Ignition system (TE - TXC)	M.19
Key	M.19
Key to wiring diagram	M.20
CHARGING SYSTEM (TE - TXC)	M.21
CHARGING SYSTEM WIRING DIAGRAM	M.21
CHARGING SYSTEM INSPECTIONS	M.22
Current loss at the battery (TE - TXC)	M.22
Regulated voltage (TE - TXC)	M.22
Voltage regulator/rectifier inspection (TE - TXC)	M.22
Voltage regulator (TE - TXC)	M.22
VOLTAGE REGULATOR/RECTIFIER WIRING DIAGRAM	M.22
ELECTRICAL STARTING SYSTEM (TE - TXC)	M.23
STARTING SYSTEM INSPECTION	M.24
Starter motor inspection (TE - TXC)	M.24
Starter motor test curves (TE - TXC)	M.24
Solenoid starter inspection (TE - TXC)	M.24
Checking coil windings resistance	M.25
Electronic control unit (ECU)	M.26
Spark plug	M.26
Gear position sensor inspection (GPS: Gear Position Sensor)	M.27
Carburettor throttle valve position sensor inspection	M.28
(TPS: Throttle Position Sensor) (TC)	M.28
BATTERY (TE - TXC)	M.29
Battery charger	M.29
HEADLAMP, TAIL LIGHT (TE)	M.30
Headlamp adjustment	M.30
Headlamp bulbs replacement	M.30
Tail light replacement	M.31
Number plate bulb replacement	M.31
Handlebar switches	M.32
Left-hand switch (TC)	M.32
Left-hand switch (TE)	M.32
Colour coding key	M.32
Right-hand switch (TE - TXC)	M.33
Colour coding key	M.33
FUSES	M.34
SEMICONDUCTOR PARTS	M.34
DIGITAL DASHBOARD, WARNING LIGHTS (TE)	M.35
5 - SPEED / NUMBER of RPM	M.37
Warning lights panel (TXC)	M.37
Dashboard replacement (TE)	M.38
TROUBLESHOOTING	M.38
CHARGING SYSTEM (TE - TXC)	M.38
STARTING SYSTEM (TE - TXC)	M.38



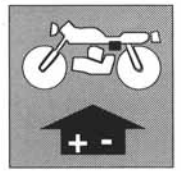


ELECTRICAL SYSTEM

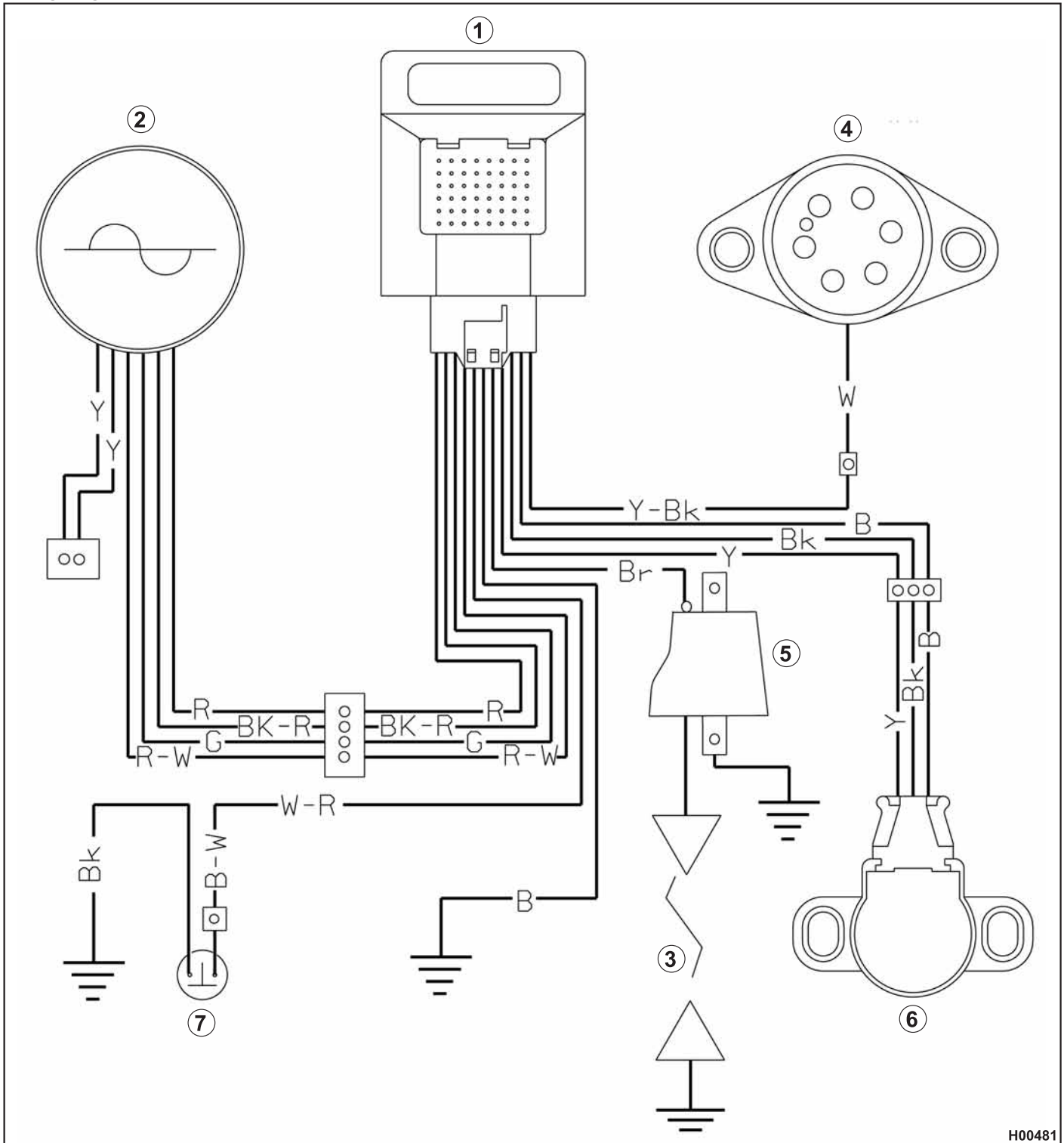
ELECTRONIC IGNITION SYSTEM.....	M.38
Wiring (TC)	M.39
Cable routing and electrical parts installation instructions (TC).....	M.40
• HT coil position (TC).....	M.40
• Fuel injection control unit position (TC).....	M.40
• Securing engine stop button ground cable to chassis (TC)	M.40
• Control unit connection (TC)	M.41
• Ignition coil connection (TC).....	M.41
• Gear sensor cable connection (TC)	M.41
• Securing the wiring harness (TC).....	M.42
• Securing the engine stop button cable (TC).....	M.42
• Securing the wiring harness (TC).....	M.42
Wiring (TE - TXC)	M.43
CABLE ROUTING AND ELECTRICAL PARTS INSTALLATION INSTRUCTIONS "TE - TXC"	M.44
• Coil position TE -TXC	M.44
• Relay and fuses position (TE - TXC)	M.44
• Turning indicators flasher (TE) and solenoid starter position (TE - TXC).....	M.44
• Electronic control unit and voltage regulator position (TE - TXC).	M.45
• Securing the starter motor/solenoid starter cable (TE - TXC).....	M.45
• Securing the engine ground to chassis and engine ground to battery cables (TE - TXC).....	M.45
• Battery negative cable routing (TE - TXC).....	M.45
• Securing the voltage regulator ground cable (TE - TXC).....	M.46
• Securing the engine ground / chassis ground cables.	M.46
Electrical system ground.....	M.46
• Wiring connection to voltage regulator (TE - TXC)	M.46
• Connection of relays and fuses (TE - TXC)	M.47
• Electric fan connection (TE - TXC)	M.47
• Injector connection (TE - TXC)	M.47
• Ignition coil connection (TE - TXC)	M.47
• Fuel pump connector position (TE -TXC)	M.48
• MAQS connector (TE - TXC)	M.48
• Engine water temperature connector	M.48
(TE - TXC).....	M.48
• Lambda sensor position and connector.....	M.48
(TE - TXC).....	M.48
• Ignition and gear sensor cable connection	M.49
• Routing of rear chassis cables, tail light connection, solenoid starter, flasher.....	M.49
• Air box cable routing	M.49
• Clip installation on fuse holders	M.49
• Clip installation on fuse holders	M.50
• Rear stop connection.....	M.50
• Routing of steering head tube wiring	M.50
• Dashboard bracket connectors (TE).....	M.50
• Headlamp, front turning indicators , STOP connection (TE).....	M.50
• Double map connector cap (TE).....	M.51
• Speed sensor and ignition switch connectors (TE).....	M.51
• Horn connector (TE)	M.51
• Securing the wiring harness to rear chassis right side.....	M.52
• Securing the wiring harness to rear chassis left side.....	M.52
• Securing the wiring harness to the chassis.....	M.52
• Securing the wiring harness.....	M.52
• Securing the wiring harness.....	M.53
• Securing the wiring harness.....	M.53
• Securing the wiring harness.....	M.53
• Securing the wiring harness.....	M.53
IMPORTANT	M.54



ELECTRICAL SYSTEM



Wiring diagram (TC)



H00481

Key to wiring diagram

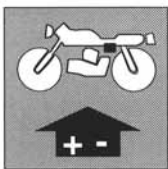
1. Electronic control unit
2. Alternator
3. Spark plug
4. Gear sensor
5. Electronic ignition coil
6. Carburettor TPS
7. Engine kill

Colour coding key

B Blue
 Br Brown
 Bk Black
 G Green
 Gr Grey
 O Orange
 P Pink

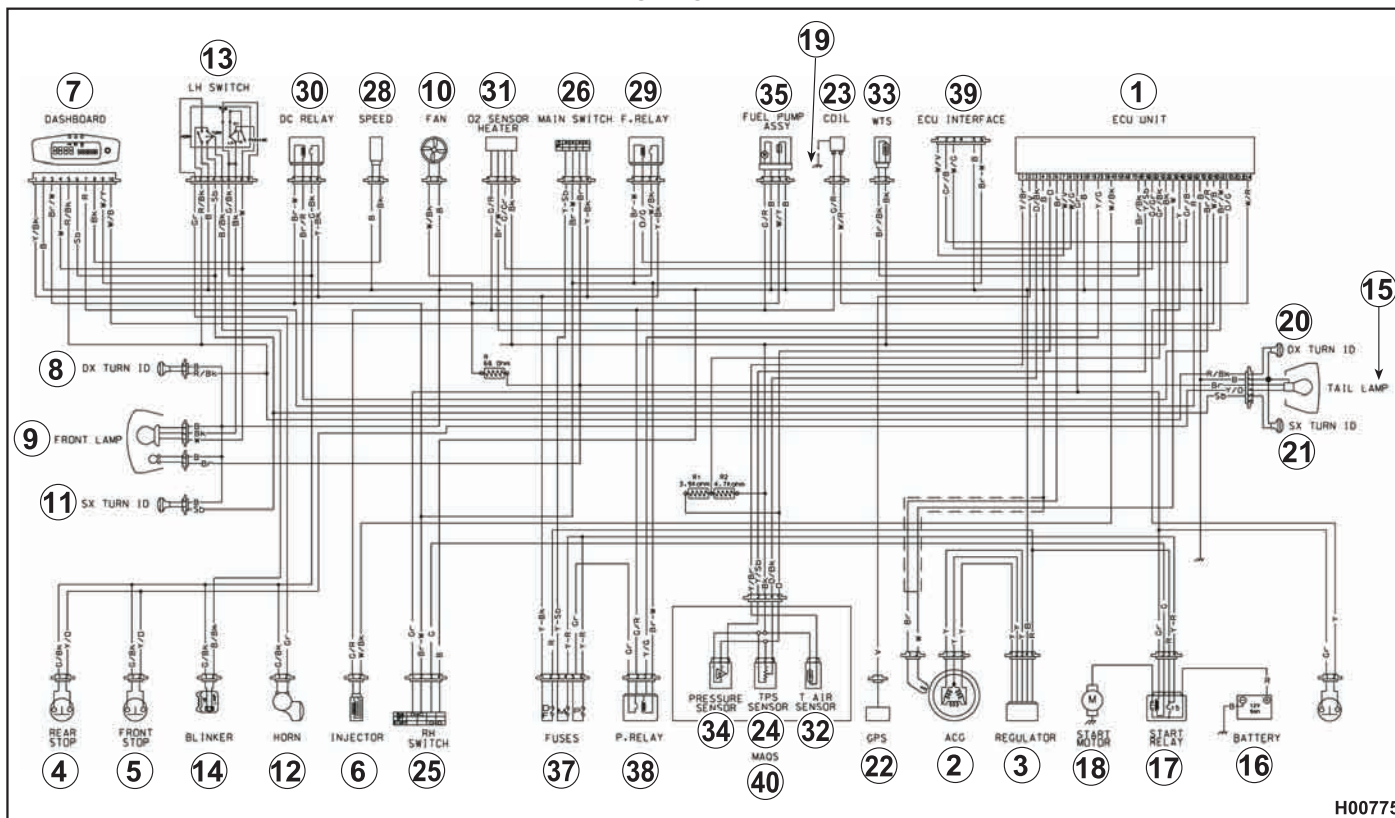
R Red
 Sb Sky blue
 V Violet
 W White
 Y Yellow





ELECTRICAL SYSTEM

Wiring diagram (TE)



H00775

Key to wiring diagram

1. Electronic control unit
2. Alternator
3. Voltage regulator
4. Rear stop light switch
5. Front stop light switch
6. Injector
7. Dashboard
8. Front R.H. turning indicator
9. Headlamp
10. Cooling fan
11. Front L.H. turning indicator
12. Horn
13. L.H. switch
14. Turning indicators flasher
15. Tail light
16. Battery
17. Solenoid starter
18. Starter motor
19. Spark plug
20. Rear R.H. turning indicator
21. Rear L.H. turning indicator
22. Gear sensor
23. HT coil
24. Throttle position sensor (40)
25. R.H. switch
26. Ignition switch
27. Fuses
28. Speed sensor
29. Solenoid valve relay
30. DC relay

31. Lambda sensor
32. Air temperature sensor (40)
33. Coolant temperature sensor
34. Pressure sensor (40)
35. Fuel pump
36. MAQS (34+24+32)
37. Fuses
38. Power relay
39. Control unit interface
40. M.A.Q.S. (34+24+32)

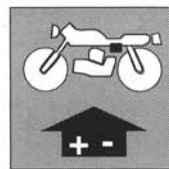
Colour coding key

B	Blue
B/Bk	Blue/Black
Bk	Black
Br	Brown
Br/Bk	Brown/Black
Br/R	Brown/Red
Br/W	Brown/White
G	Green
G/Bk	Green/Black
G/Gr	Green/Grey
G/R	Green/Red
Gr	Grey
Gr/B	Grey/Blue
Gr/Bk	Grey/Black
O	Orange
O/Bk	Orange/Black
O/G	Orange/Green
Pk	Pink
R	Red
R/Bk	Red/Black

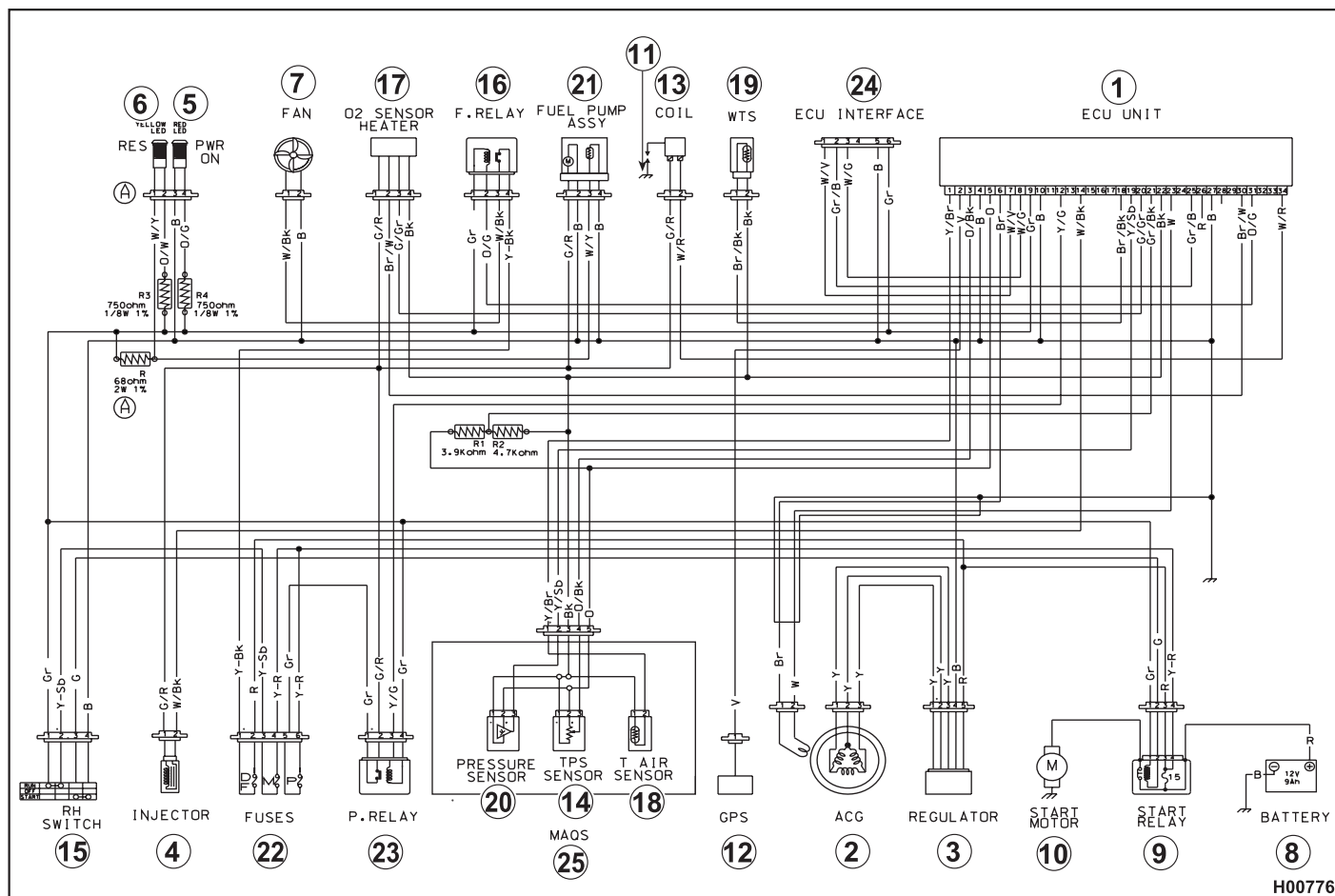
Sb	Sky blue
V	Violet
W	White
W/B	White/Blue
W/Bk	White/Black
W/G	White/Green
W/R	White/Red
W/V	White/Violet
W/Y	White/Yellow
Y	Yellow
Y/Bk	Yellow/Black
Y/Br	Yellow/Brown
Y/G	Yellow/Green
Y/O	Yellow/Orange
Y/Sb	Yellow/Sky blue
Y/R	Yellow/Red



ELECTRICAL SYSTEM



Wiring diagram (TXC)



Key to wiring diagram

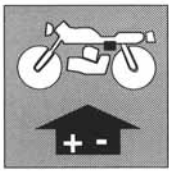
1. Electronic control unit
2. Alternator
3. Voltage regulator
4. Injector
5. Generator warning light (12V-2W) RED
6. Fuel reserve warning light (12V-2W) ORANGE
7. Cooling fan
8. Battery
9. Solenoid starter
10. Starter motor
11. Spark plug
12. Gear sensor
13. HT coil
14. Throttle position sensor (25)
15. R.H. switch
16. Electric fan relay
17. Lambda sensor
18. Air temperature sensor (25)
19. Coolant temperature sensor
20. Pressure sensor (25)
21. Fuel pump
22. Fuses
23. Power relay
24. Control unit interface
25. M.A.Q.S. (14+18+20)

Colour coding key

B Blue
 Bk Black
 Br Brown
 Br/Bk Brown/Black
 Br/W Brown/White
 G Green
 G/Gr Green/Grey
 G/R Green/Red
 Gr Grey
 Gr/B Grey/Blue
 Gr/Bk Grey/Black
 O Orange
 O/Bk Orange/Black
 O/G Orange/Green
 R Red
 V Violet
 W White
 W/Bk White/Black
 W/G White/Green
 W/R White/Red
 W/V White/Violet
 W/Y White/Yellow
 Y Yellow
 Y/Bk Yellow/Black
 Y/Br Yellow/Brown

Y/G Yellow/Green
 Y/Sb Yellow/Sky blue
 Y/R Yellow/Red





ELECTRICAL SYSTEM

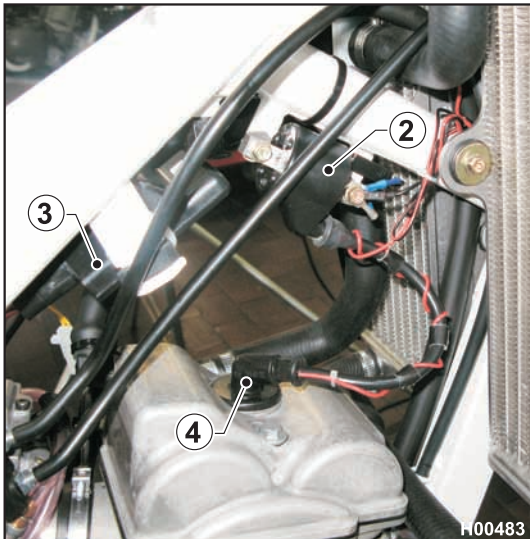
Electrical components location (TC)

The ignition system includes the following elements:

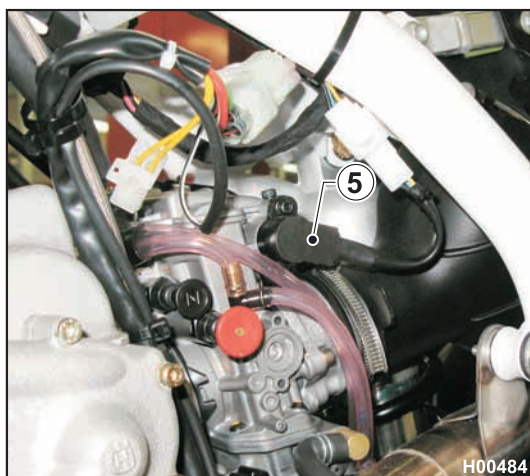
- Generator (1), on the inner side of L.H. crankcase half cover;



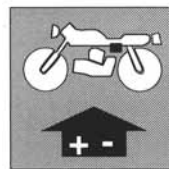
- Electronic ignition coil (2) under the fuel tank;
- Electronic control unit (3) under the fuel tank;
- Spark plug (4) on cylinder head;



- Throttle position sensor (5) on carburettor.



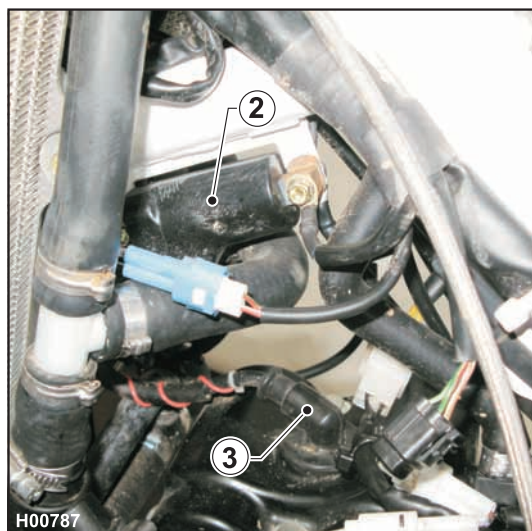
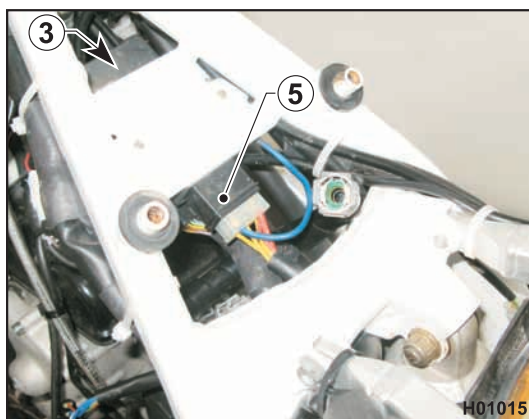
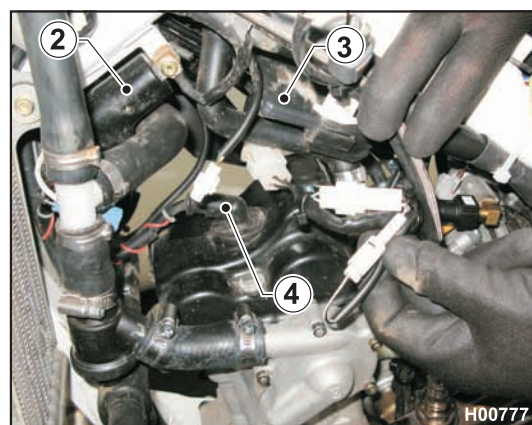
ELECTRICAL SYSTEM

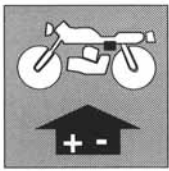


Electrical components location (TE)

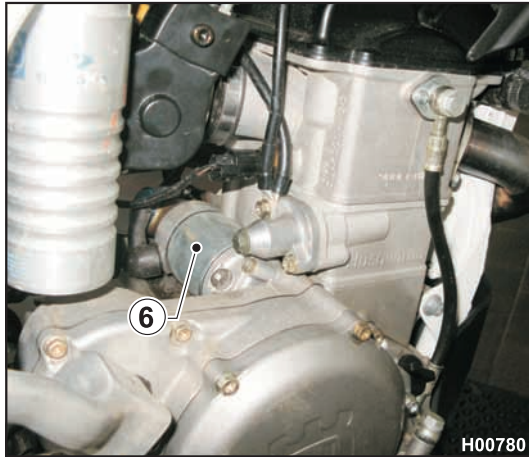
The ignition system includes the following elements:

- Generator (1), on the inner side of L.H. crankcase half cover;
- Electronic ignition coil (2) under the fuel tank;
- Electronic control unit (3) under the fuel tank;
- Spark plug (4) on cylinder head;
- Voltage regulator (5) under the fuel tank, over the electronic control unit (3);

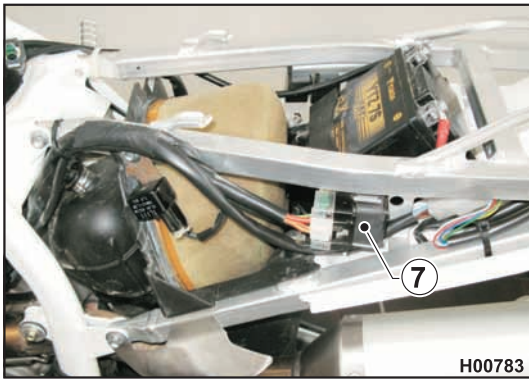




ELECTRICAL SYSTEM



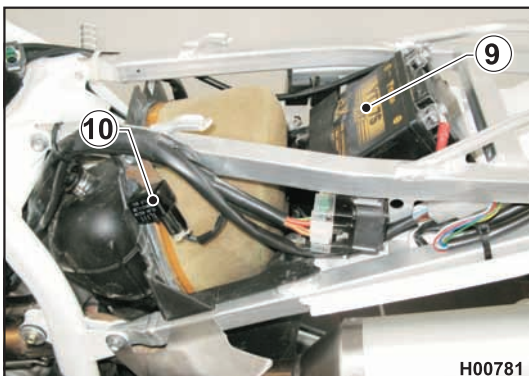
- 12V-350W starter motor (6) behind the cylinder;



- Solenoid starter (7) on left side of rear chassis;



- M.A.Q.S. sensor (air temperature, pressure, throttle position) (8) on throttle body.

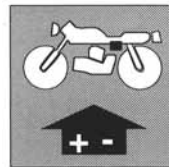


The electrical system includes the following elements:

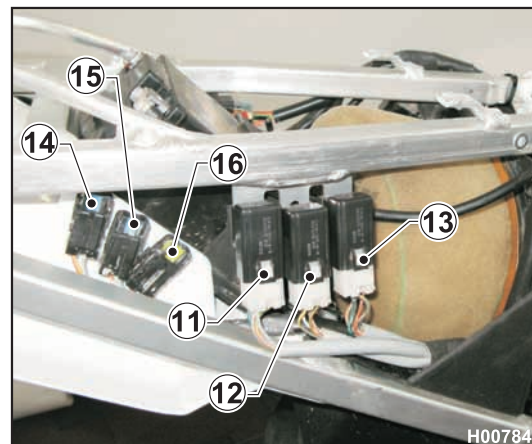
- 12V-7Ah battery (9) under the saddle;
- Turning indicators flasher (10) on left side of rear chassis;



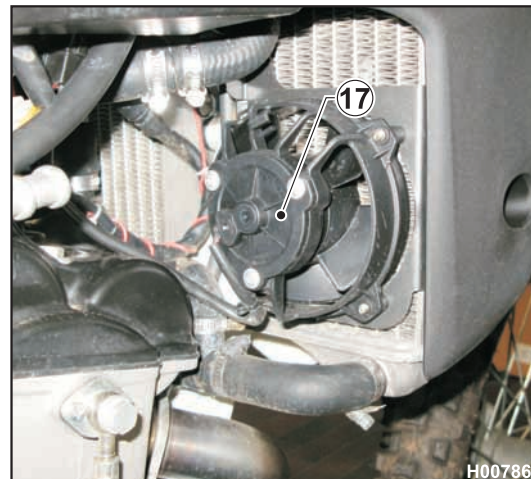
ELECTRICAL SYSTEM



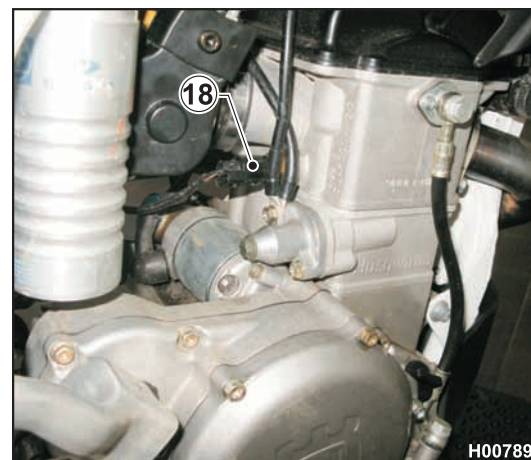
- Relay (11): coil, injection system, fuel pump, on right side of rear chassis;
- Relay (12): electric fan, on right side of rear chassis;
- Relay (13): light system, turning indicators, horn, on right side of rear chassis;
- Fuses (14), (15), (16): on rear mudguard, right side:
 - Fuse 14 (15A): coil, injection system, fuel pump;
 - Fuse 15 (15A): dashboard, parking lights, control unit;
 - Fuse 16 (20A): electric fan, light system, turning indicators, horn.

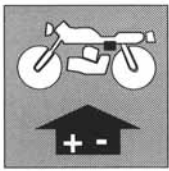


- Electric fan (17);



- Coolant temperature sensor (18);
- Lambda sensor (19);

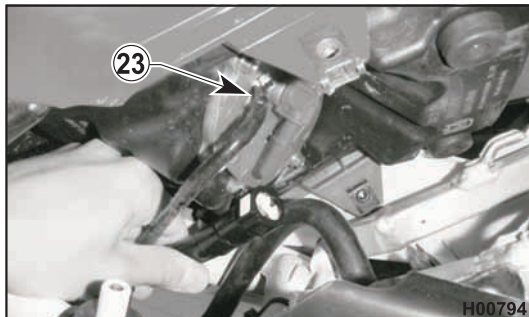
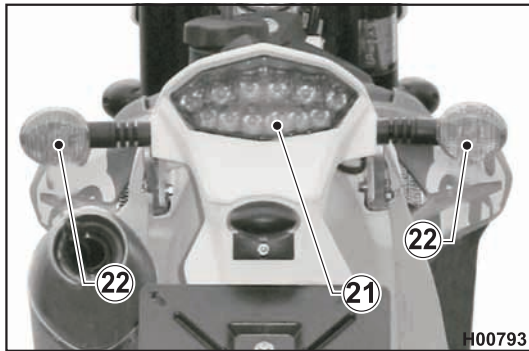




ELECTRICAL SYSTEM

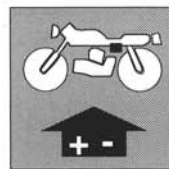


- Headlamp (20) with 12V-35/35W twin halogen bulb and 12V-5W parking light bulb;
- LED tail light (21);
- Turning indicators (22), 12V-10W bulbs;



- Fuel pump (23) inside the fuel tank.





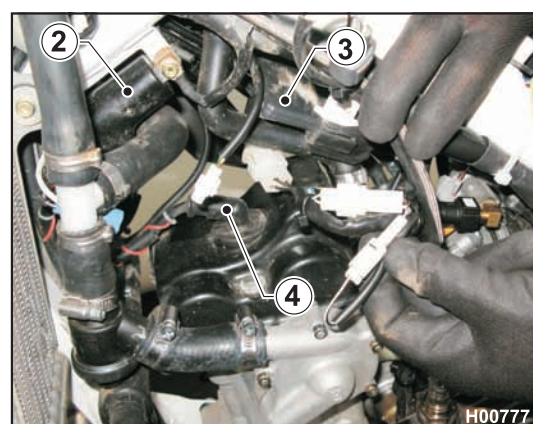
Electrical components location (TXC)

The ignition system includes the following elements:

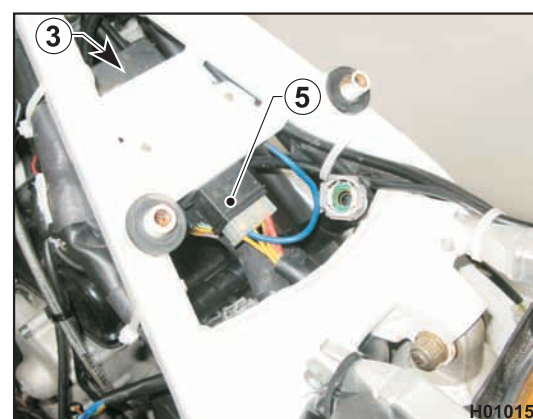
- Generator (1), on the inner side of L.H. crankcase half cover;

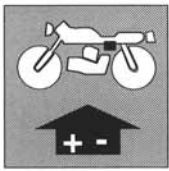


- Electronic ignition coil (2) under the fuel tank;
- Electronic control unit (3) under the fuel tank;
- Spark plug (4) on cylinder head;

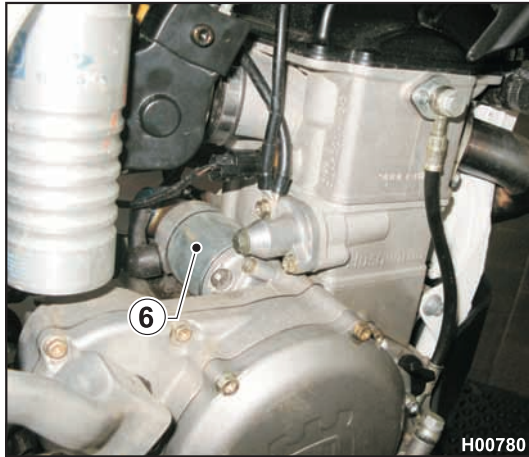


- Voltage regulator (5) under the fuel tank, over the electronic control unit (3);

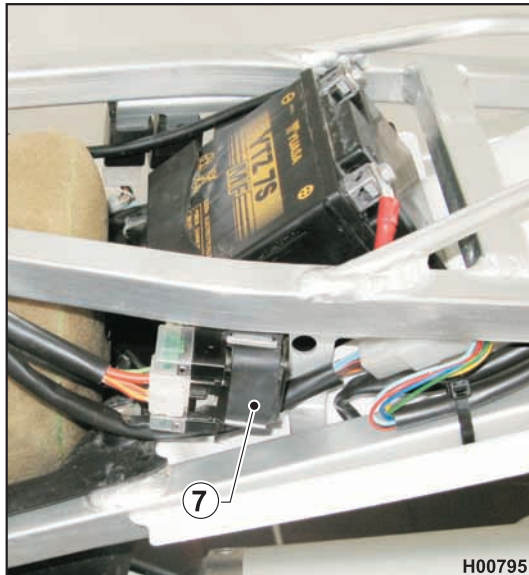




ELECTRICAL SYSTEM



- 12V-350W starter motor (6) behind the cylinder;



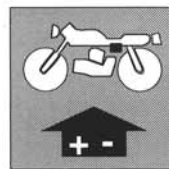
- Solenoid starter (7) on left side of rear chassis;



- M.A.Q.S. sensor (air temperature, pressure, throttle position) (8) on throttle body.

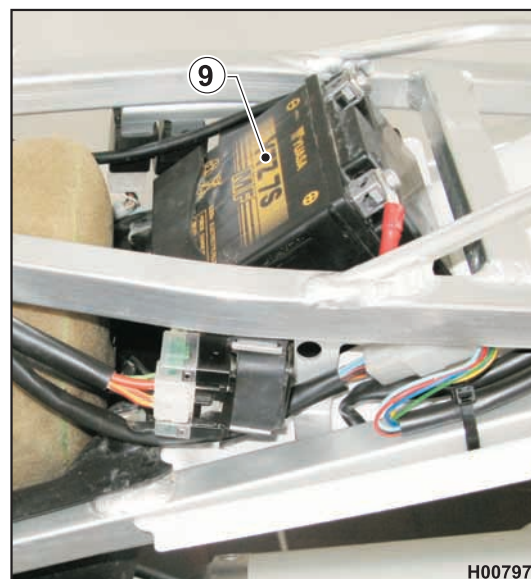


ELECTRICAL SYSTEM

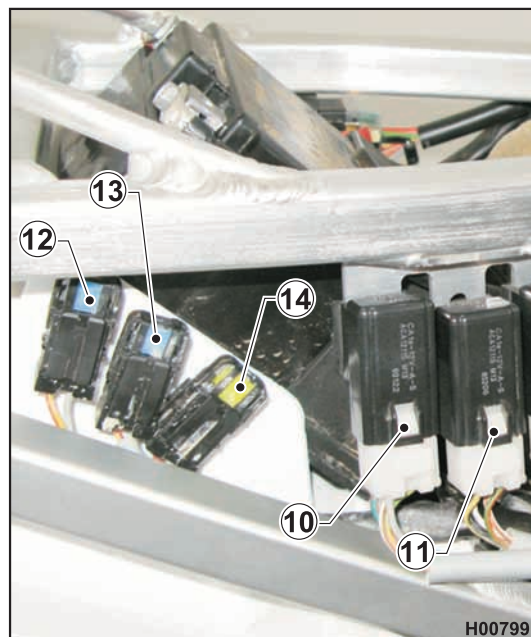


The electrical system includes the following elements:

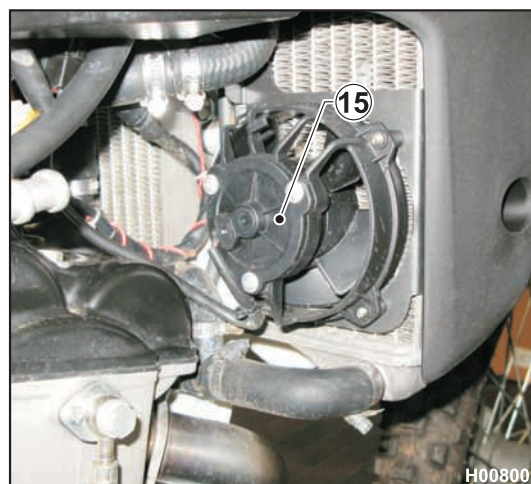
- 12V-7Ah battery (9) under the saddle;

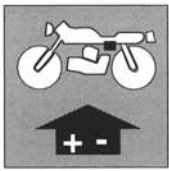


- Relay (10): coil, injection system, fuel pump, on right side of rear chassis;
- Relay (11): solenoid valve, on right side of rear chassis;
- Fuses (12), (13), (14): on rear mudguard, right side:
 - Fuse 12 (15A): coil, injection system, fuel pump;
 - Fuse 13 (15A): control unit;
 - Fuse 14 (20A): electric fan.

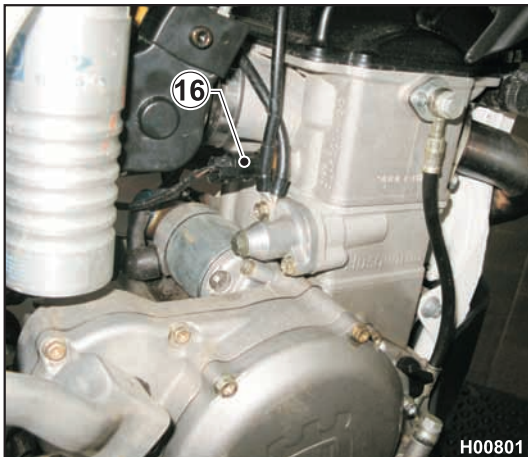


- Electric fan (15);





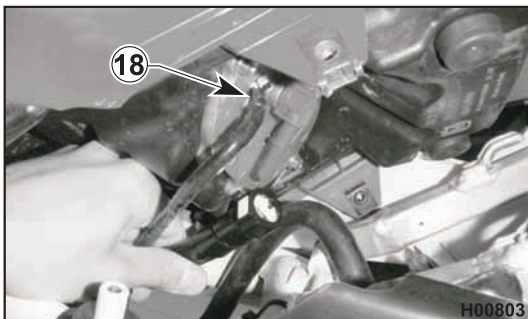
ELECTRICAL SYSTEM



- Coolant temperature sensor (16);



- Lambda sensor (17);

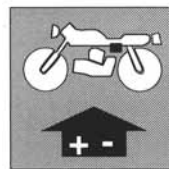


- Fuel pump (18) inside the fuel tank.

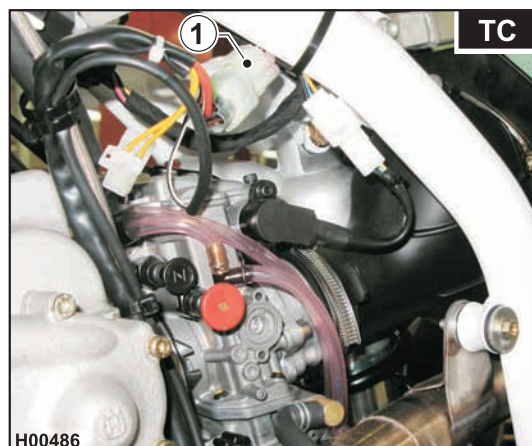
Checking generator stator windings resistance

Disconnect the stator coil connector from the wiring and measure resistance with a meter.



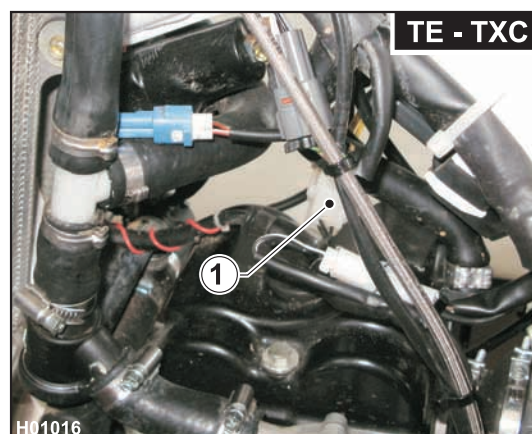
**TC**

- 1) Take following measurements at the connector (1):
- EXCITER:
Resistance between BLACK-RED and RED-WHITE wires:
 $24 \Omega \pm 15\%$.
- CHARGE:
Resistance between YELLOW-YELLOW wires:
 $0.65 \Omega \pm 15\%$.
- PULSER:
Resistance between RED-GREEN wires:
 $100 \Omega \pm 15\%$.

**TE - TXC**

- 1) Measure across the terminals of the connector (1); correct value is about 0.6Ω .

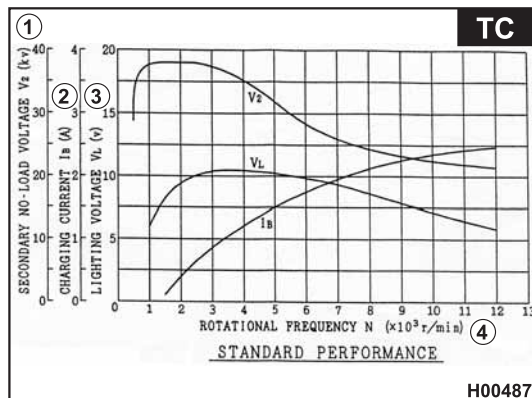
If resistance is outside the specified limits, replace the complete generator.

**Generator no-load performance (TC)**

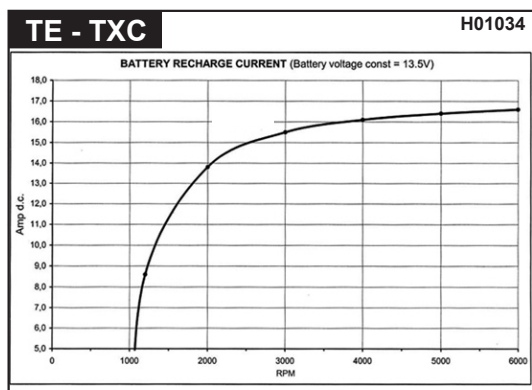
- 1- Secondary winding voltage under no-load conditions
- 2- Battery charging current
- 3- Light voltage
- 4- RPM

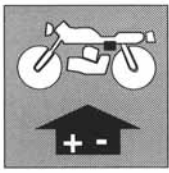


AT EACH ENGINE OVERHAUL, CLEAN FLYWHEEL ROTOR TO REMOVE ANY DEBRIS SUSPENDED IN SWIRLING OIL AND CAPTURED BY THE MAGNETS.

**Generator no-load performance (TE-TXC)**

RPM	A D.C. (typical)
1200	8.6
2000	13.8
3000	15.5
5000	16.4
6000	16.6





ELECTRICAL SYSTEM

Ignition system (TC)

In the Capacitor Discharge Ignition (C.D.I.) system, the capacitor is charged using the power generated by the alternator. Alternator current is then discharged to the primary winding of the ignition coil in a single discharge that is timed based on the predetermined spark advance. The high voltage induced in the secondary winding of the ignition coil generates a strong spark across the spark plug electrodes.

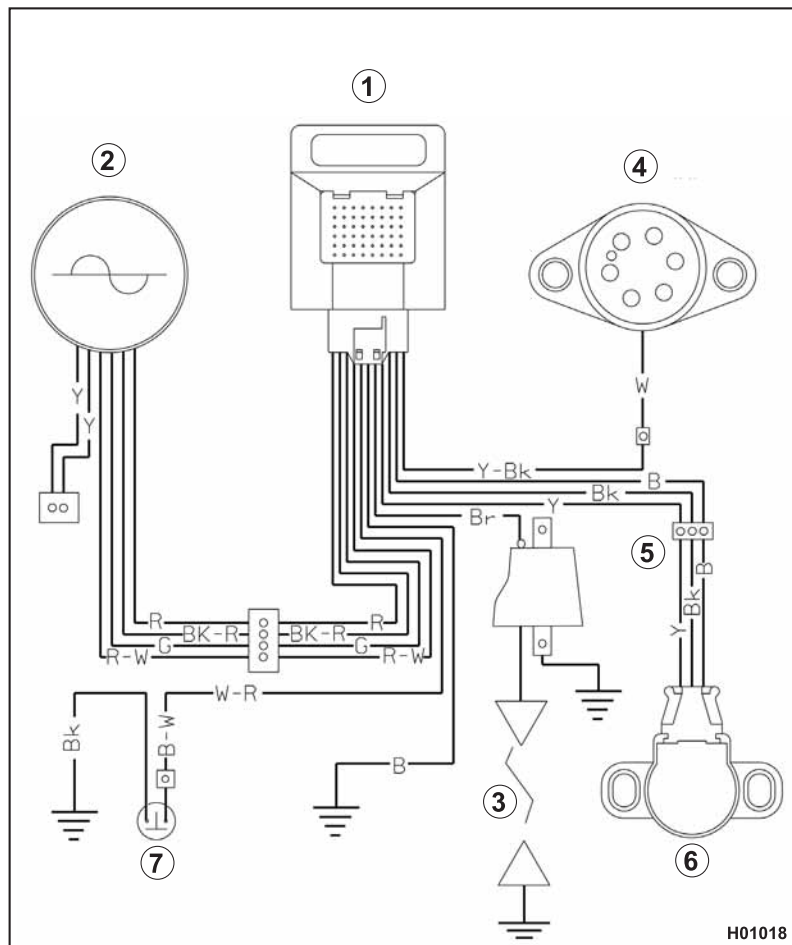
The digital electronic ignition system allows for timing curve adjustment according to these factors:

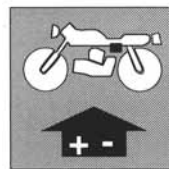
- ENGINE RPM;
- POSITION OF CARBURETTOR THROTTLE VALVE;
- GEAR ENGAGED.

This system ensures optimal engine performance under any operating conditions. The ignition will keep the engine running even in the event of a throttle valve or gear sensor malfunction.

The electronic ignition system includes the following elements:

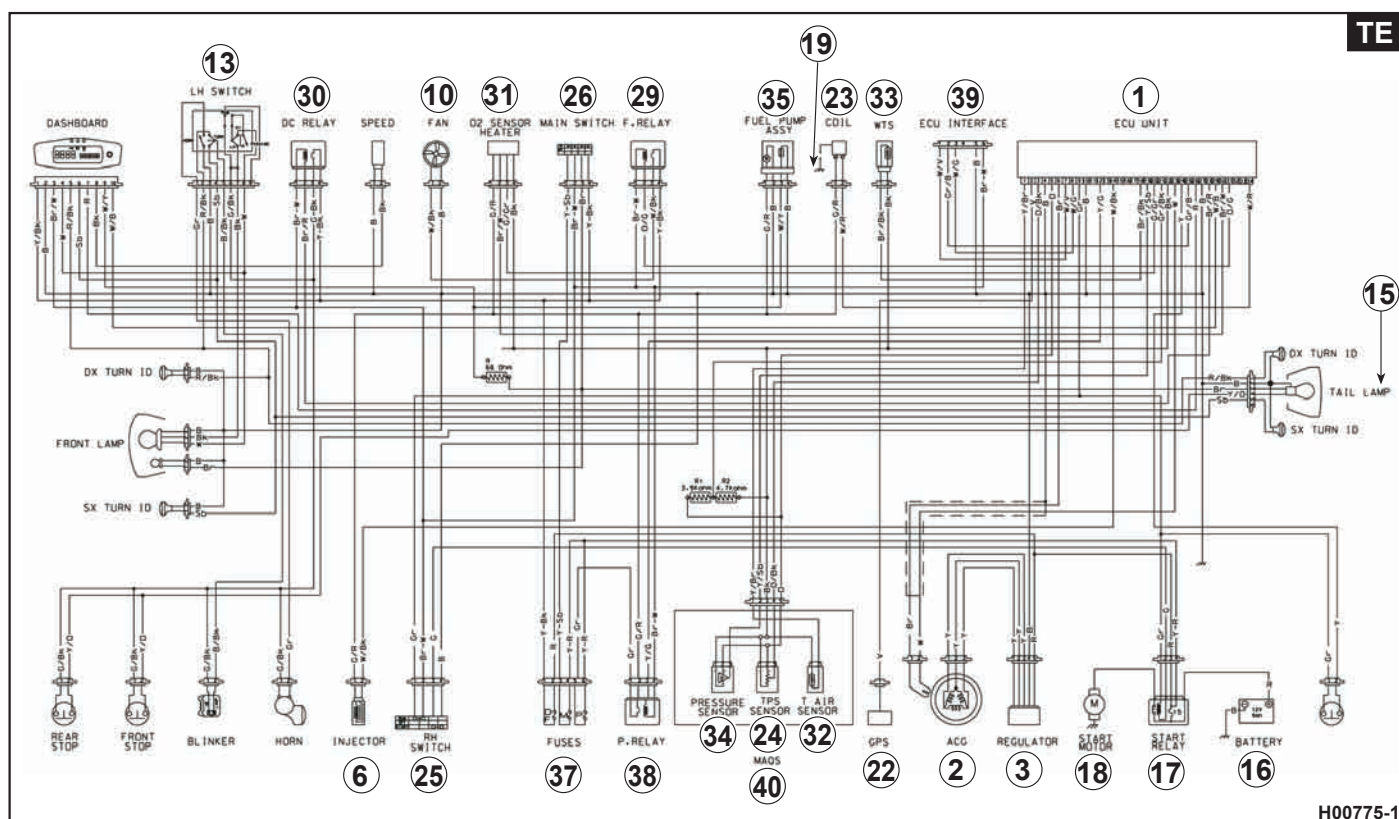
- Electronic control unit (1);
- Alternator (2);
- Spark plug (3);
- Gear sensor (4);
- Coil (5);
- Carburettor TPS (Throttle Position Sensor) (6);
- Engine kill switch (7).





Ignition system (TE - TXC)

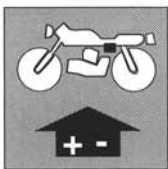
The ignition system is controlled by the ECU (1). The ignition is an integrated digital electronic ignition system with static timing and advance using intermittent sequential phased electronic injection feed. This ignition system is composed of a crankshaft position (pick-up) sensor, an ECU, an ignition coil and an intake manifold pressure sensor. The ignition coil is fed by the battery through a power relay and is controlled by the ECU. Ignition timing is accurately determined based on engine RPM and accelerator position. In addition to these key parameters, inputs from the intake air temperature and pressure sensor and from the coolant sensor are also used to control ignition timing.



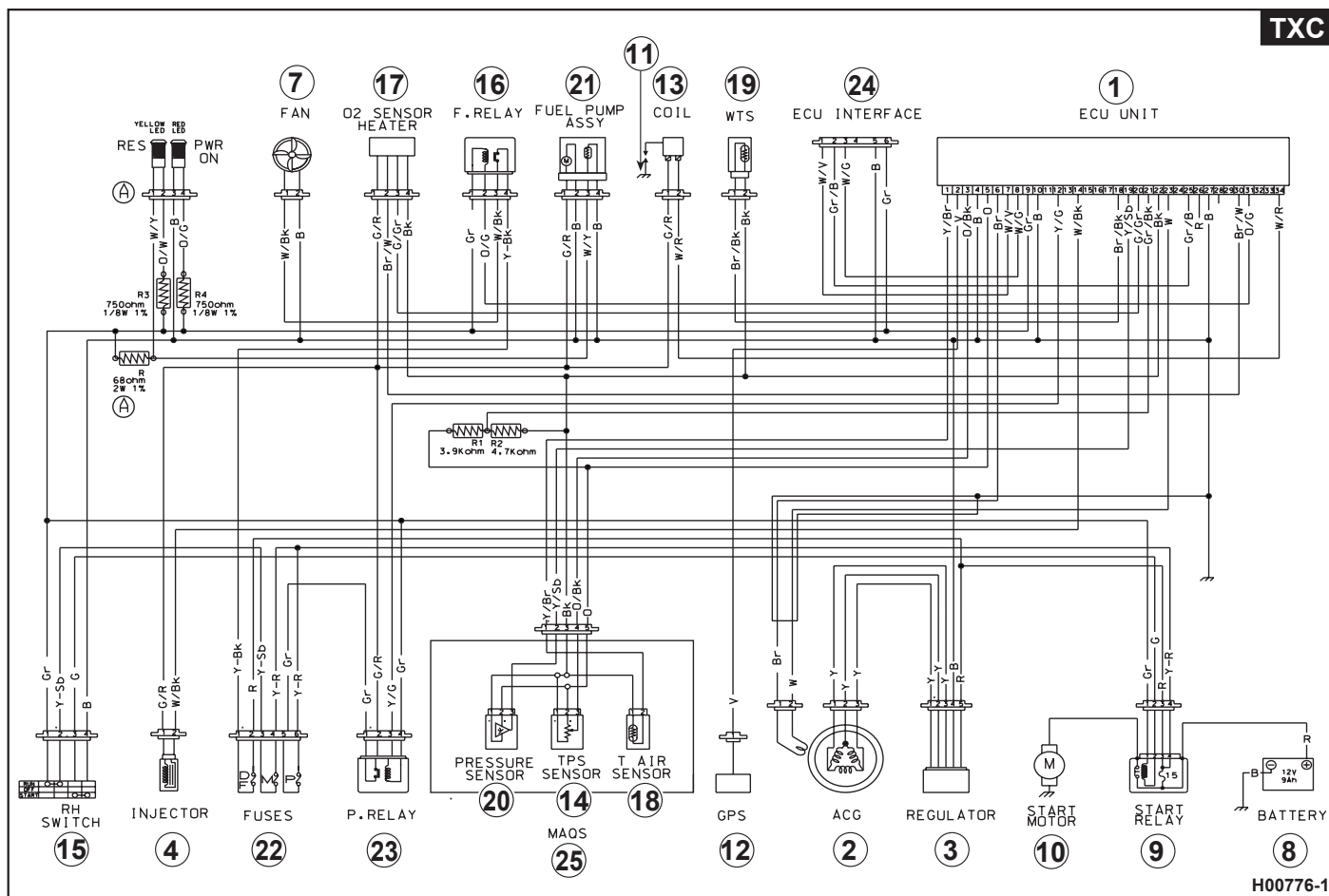
Key

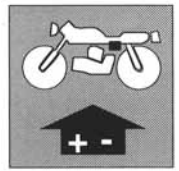
- | | |
|----------------------------|-----------------------------------|
| 1. Electronic control unit | 24. Throttle position sensor (40) |
| 2. Alternator | 25. R.H. switch |
| 3. Voltage regulator | 26. Ignition switch |
| 6. Injector | 29. Solenoid valve relay |
| 10. Cooling fan | 30. DC relay |
| 13. L.H. switch | 31. Lambda sensor |
| 15. Tail light | 32. Air temperature sensor (40) |
| 16. Battery | 33. Coolant temperature sensor |
| 17. Solenoid starter | 34. Pressure sensor (40) |
| 18. Starter motor | 35. Fuel pump |
| 19. Spark plug | 37. Fuses |
| 22. Gear sensor | 38. Power relay |
| 23. HT coil | 39. Control unit interface |
| | 40. M.A.Q.S. (34+24+32) |





ELECTRICAL SYSTEM





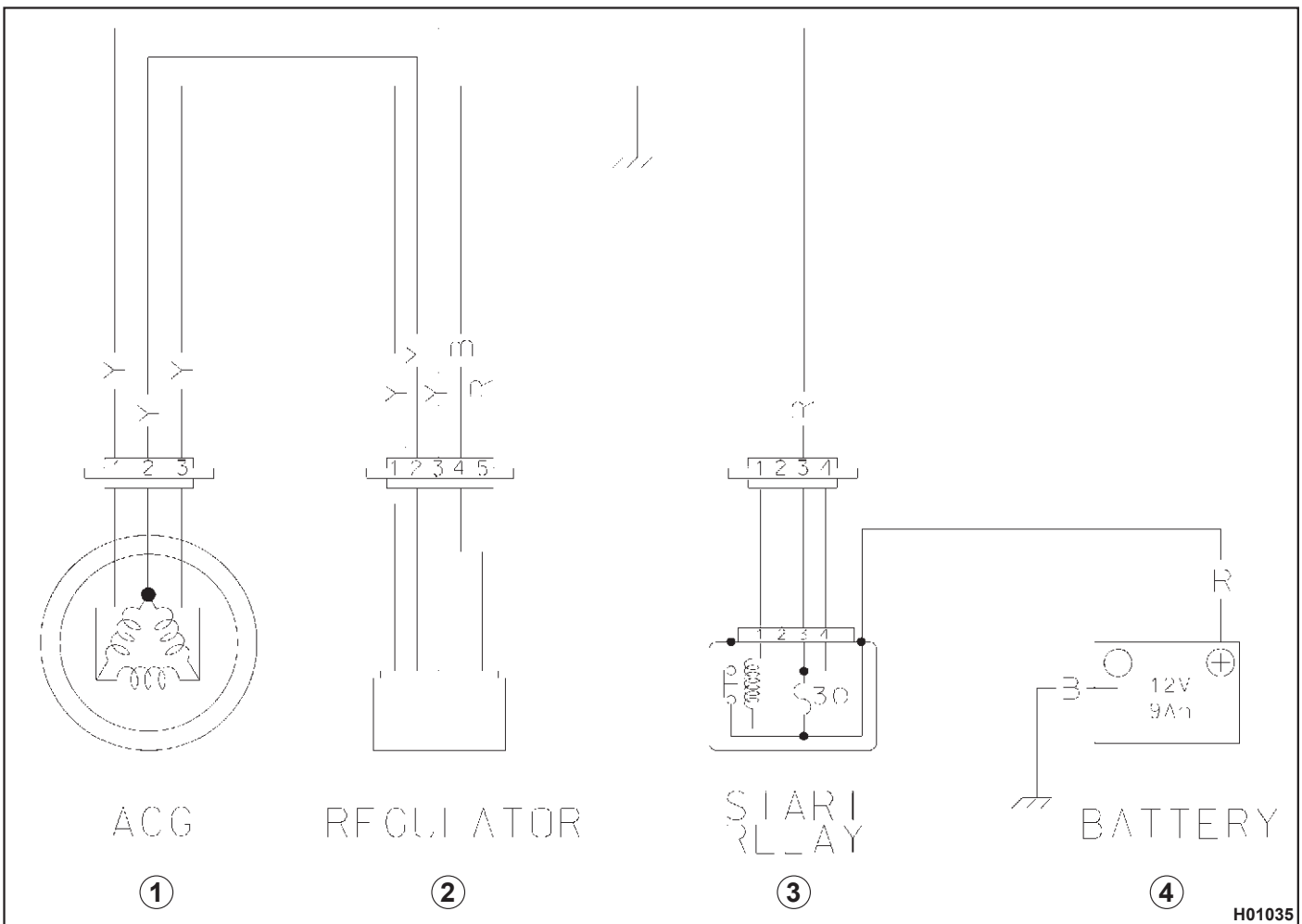
CHARGING SYSTEM (TE - TXC)

The charging system is composed of:

- Alternator (1);
- Voltage regulator/rectifier (2);
- Solenoid starter (3);
- Battery (4).

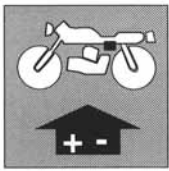
The alternated current generated by the alternator is converted into direct current by the voltage regulator/rectifier. The voltage regulator/rectifier serves a dual purpose: it provides overvoltage protection for the battery and converts alternated current into direct current. All components listed above help keep voltage constant and protect the battery against overloading.

CHARGING SYSTEM WIRING DIAGRAM

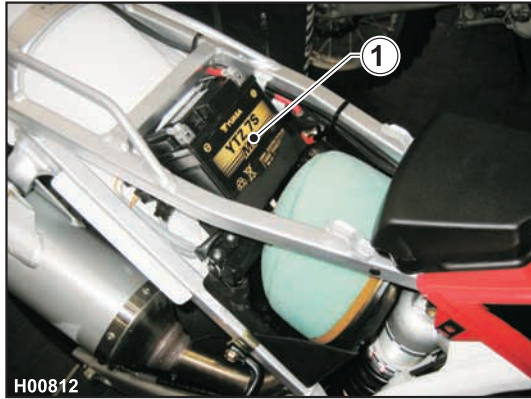


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ELECTRICAL SYSTEM



CHARGING SYSTEM INSPECTIONS

Current loss at the battery (TE - TXC)

Remove the saddle (as described in the relevant paragraph) to gain access to the battery (1).

Disconnect the BLACK negative cable from the battery.

Measure current across the negative terminal of the battery and the negative cable using a meter. A reading greater than 1 mA indicates current loss.

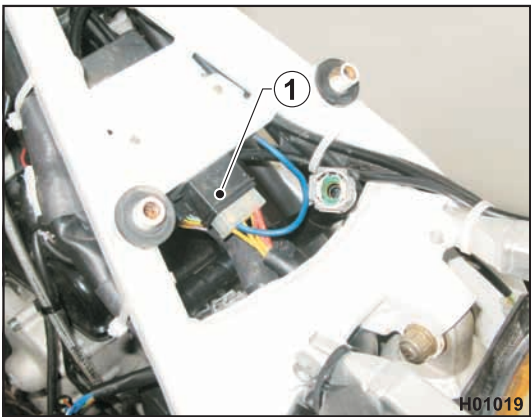


If the vehicle is to remain unused for long periods, it is recommended to disconnect the battery from the electrical system and store it in a dry place.

Regulated voltage (TE - TXC)

Remove the saddle (as described in the relevant paragraph) to gain access to the battery.

With the engine warmed up and running at slightly above 3000 rpm, measure voltage across the positive and negative terminal of the battery using a meter (the battery must be charged when performing this test). If reading is outside a 12.5-14.5 V range, check generator and voltage regulator/rectifier as described in the relevant paragraph.



Voltage regulator/rectifier inspection (TE - TXC)

With the ignition on and the battery charged (12.5-13 V), start the engine: if battery voltage fails to rise (14 V) within the next two minutes, change the regulator (1) as outlined in the relevant paragraph.

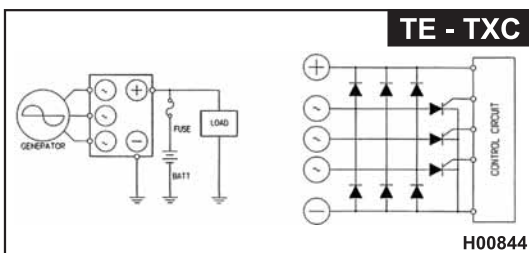
Voltage regulator (TE - TXC)

The voltage regulator (1) incorporates the diodes used to rectify the generator current output.

It also incorporates an electronic device that adjusts charging voltage to battery charge: if battery charge is low, charging voltage will be lower.



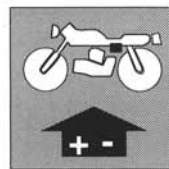
Do not disconnect the battery cables while the engine is running, or the regulator will suffer irreparable damage.



VOLTAGE REGULATOR/RECTIFIER WIRING DIAGRAM



ELECTRICAL SYSTEM

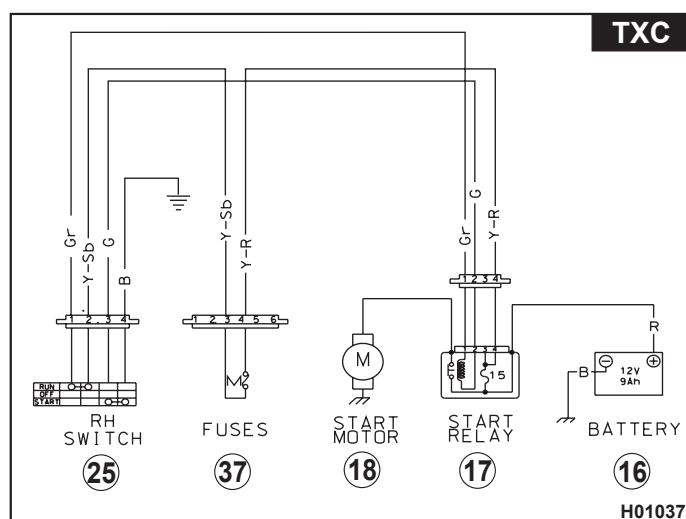
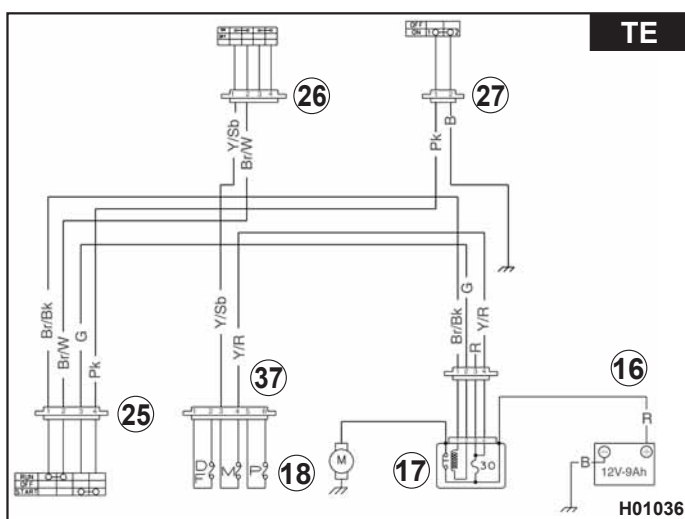


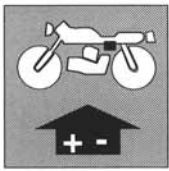
ELECTRICAL STARTING SYSTEM (TE - TXC)

The starting system is composed of:

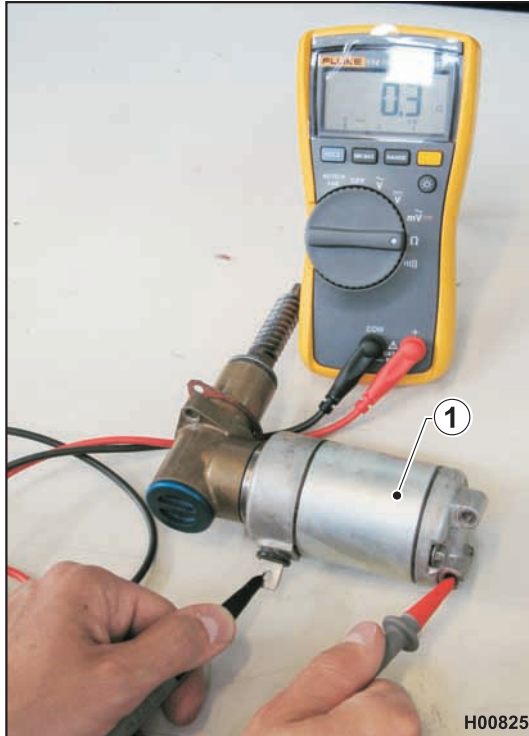
- Battery (16);
- Solenoid starter (17);
- Starter motor (18);
- R.H. switch (25);
- Clutch microswitch (27) (TE);
- Ignition switch (26) (TE);
- Fuses (37).

For a description of wires and components, please see the key to the wiring diagram





ELECTRICAL SYSTEM



STARTING SYSTEM INSPECTION

Starter motor inspection (TE - TXC)

Remove the starter motor (1) as described in the relevant paragraph.

Whenever a starter motor fault is detected, check the starter motor as follows:

- connect a meter across ground and starter motor contact.

- Check for continuity between the positive pole and motor ground. If no continuity is found, replace the starter motor. On assembly, apply a small amount of LOCTITE 243 to the starter motor retaining screws.

Starter motor

Rated voltage: 12V

Current draw: 350 W

No-load test

Voltage: 11.2 V

Current: 30 A

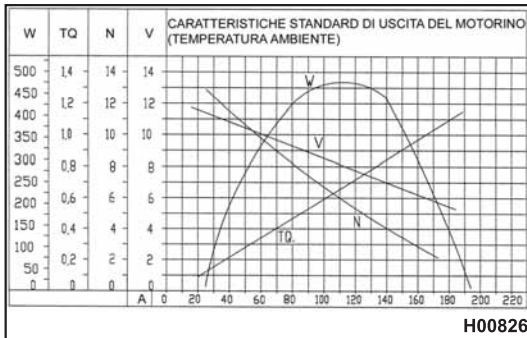
Speed: 12,000 rpm

Cranking test

Voltage: 10 V

Current: 80 A

Torque: 3.5 Nm - 0.35 Kgm - 2.5 ft/lb



Starter motor test curves (TE - TXC)

1 - Output power (W)

2- Torque (TQ)

3- RPM (N: rpm. x 1000)

4 - Light voltage (V)

5 - Charging current (A)

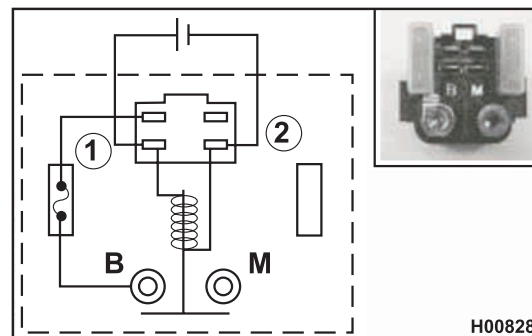
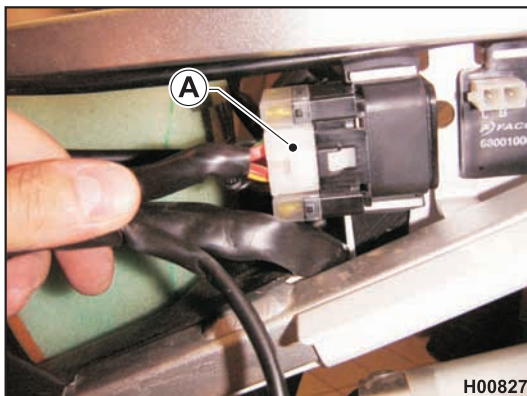
Solenoid starter inspection (TE - TXC)

Disconnect the cables at the battery negative terminal to avoid possible short circuits during disassembly. Disconnect the starter relay connector (A).

Disconnect the starter motor and battery positive cable wires at relay end. Apply 12 Volts to relay terminals (1) and (2) and check for continuity between terminals B-M. **Do not feed battery voltage to the relay longer than 5 seconds** or the relay might overheat, leading to winding damage. Use a multimeter to establish whether the winding is open circuit or resistance exists. A winding in good condition will give the following resistance readings.

Meter scale setting: Ohm

Starter relay resistance. Standard: 3-6 Ω.

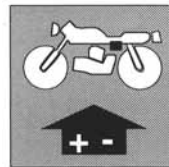


Solenoid starter wiring diagram

1= GROUND

2= + 12 V



**Checking coil windings resistance**

Remove saddle and fuel tank (see relevant paragraph) to gain access to the coil (1).

Disconnect the coil connector from the wiring, remove retaining screws and coil and measure resistance in the primary and secondary windings with a meter.

Inductive coil for fuel-injected TE/TXC 250:

- Primary winding resistance: $4.5 \Omega \pm 15\%$ at 20°C .
- Secondary winding resistance: $19.5 \text{ K}\Omega \pm 20\%$ at 20°C (without spark plug cap cable).

Capacitive coil for carburetted TC 250:

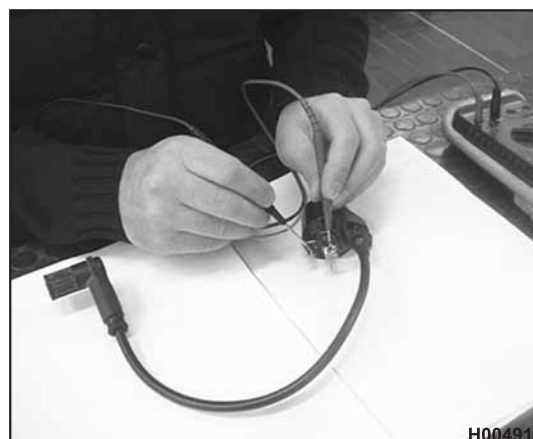
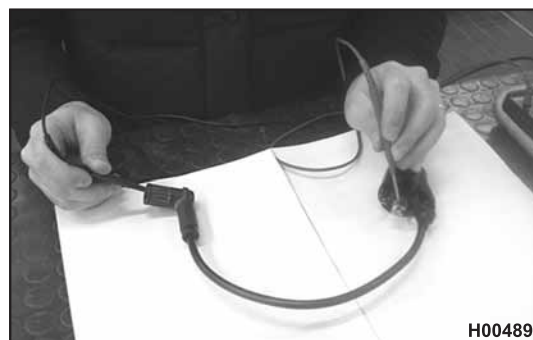
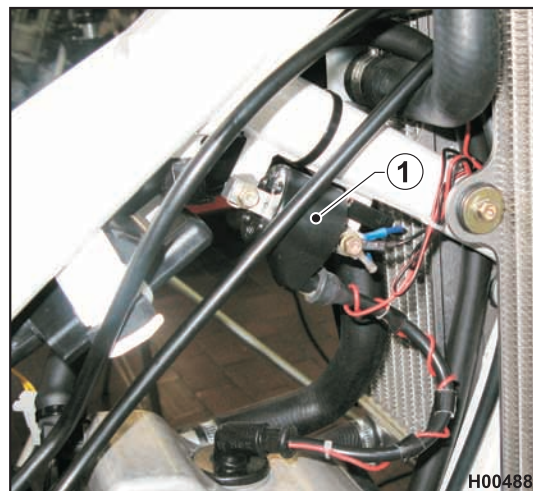
- Primary winding resistance: $0.3 \Omega \pm 15\%$ at 20°C .
- Secondary winding resistance: $6.3 \text{ K}\Omega \pm 20\%$ at 20°C (without spark plug cap cable).

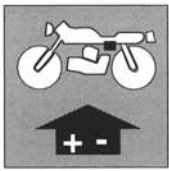
If resistance is outside the specified limits, replace the coil. Also check the resistance of the terminal cap contacting the spark plug.

- Terminal cap resistance: $4.5\text{-}5.5 \text{ K}\Omega \pm 5\%$ at 20°C .

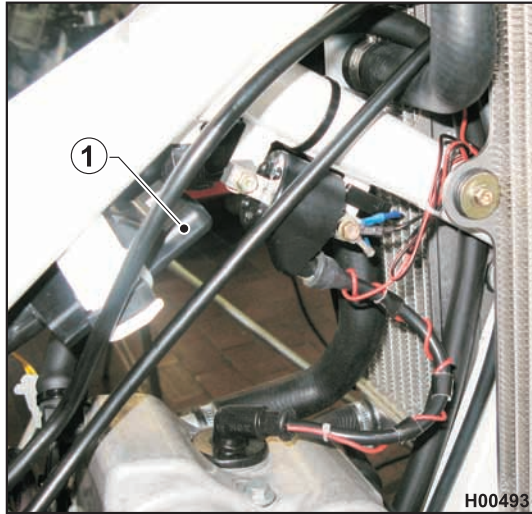
If resistance is outside the specified limits, replace the cap.

NOTE: The area where the coil is secured must be totally free from oxide and paint. A faulty ground contact will damage the coil and cause ignition problems.





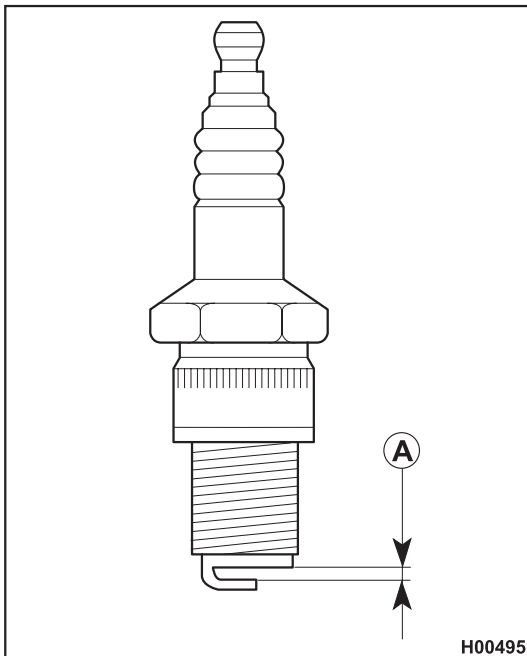
ELECTRICAL SYSTEM



Electronic control unit (ECU)

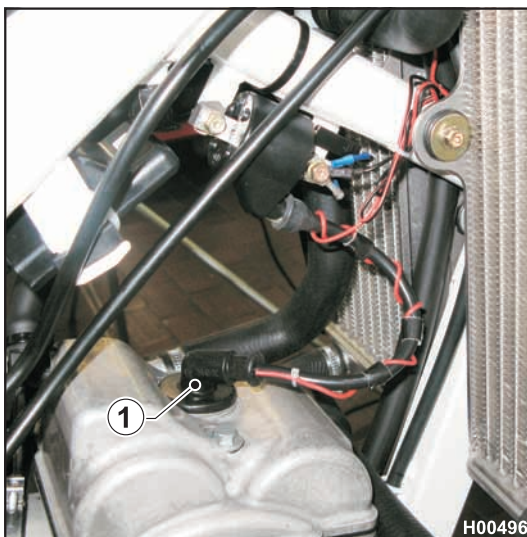
Remove saddle and fuel tank (see Section E) to gain access to the electronic control unit (1).

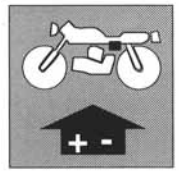
It is composed of a capacitor, a rectifier circuit that handles input signals received from the pick-up sensor, a circuit that controls ignition timing advance in accordance with pick-up sensor inputs and a switching circuit for capacitor discharge.



Spark plug

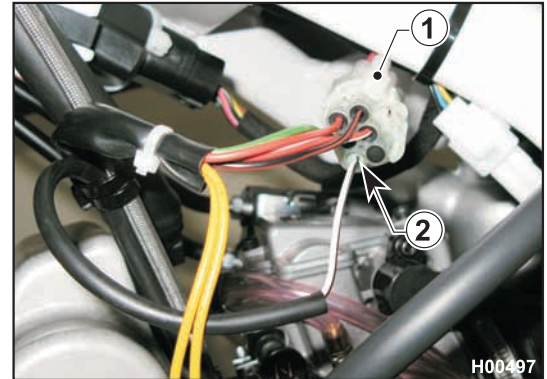
The spark plug (1) is an "NGK" CR9EB spark plug. Check electrode gap "A" (0.7 mm). A wider gap may cause difficulties in starting the engine and overload the coil. A gap that is too narrow may cause difficulties when accelerating, when idling or poor performance at low speed. Clean off any dirt around spark plug base before removing the spark plug. It is good practice to closely inspect the spark plug after removal, as any deposits on it and the colour of the insulator provide useful indications on spark plug heat rating, carburetion, ignition and the general condition of the engine. Before refitting the spark plug, accurately clean the insulator with a wire brush. Smear some graphite grease on spark plug thread, do it fully home finger tight then tighten it to 10÷12 Nm torque. Loosen the spark plug then tighten it again to 10÷12 Nm. Spark plugs which have cracked insulators or corroded electrodes should be replaced.





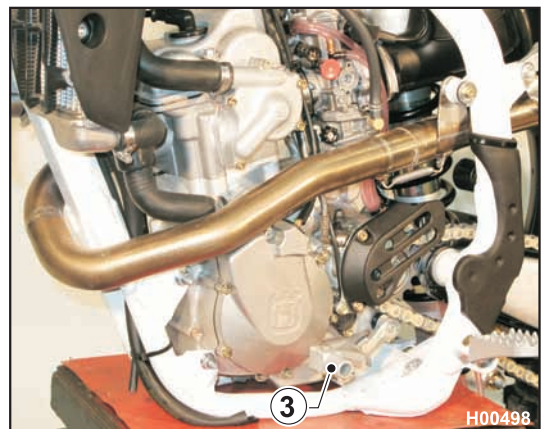
Gear position sensor inspection (GPS: Gear Position Sensor)

Set the meter to the "Ohm" scale and disconnect the six-way connector (1) of the alternator from the main wiring harness (the gear sensor wiring is secured to the alternator wiring with a clip). Touch one meter probe to engine ground and insert the other probe into the connector hole for the WHITE/BLACK gear sensor wire (2). The lever (3) is placed on the left-hand side of the engine. After each gear shift, it automatically returns to the horizontal position. First gear is engaged by pushing the lever downwards; for other gears push it upwards. Check the readings provided in the relevant table.



TC

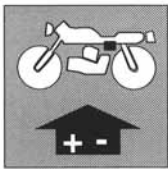
A	NEUTRAL (open circuit)	∞
B	1st	556-568 Ω
C	2nd	817-833 Ω
D	3rd	1.48-1.51 K Ω
E	4th	2.71-2.77 K Ω
F	5th	6.75-6.88 K Ω



TE - TXC

A	NEUTRAL	312-319 Ω
B	1st	725-739 Ω
C	2nd	1,31-1,34 Ω
D	3rd	2.18-2.23 K Ω
E	4th	3.61-3.68 K Ω
F	5th	6.58-6.71 K Ω
G	6th	15.2-15.5 K Ω





ELECTRICAL SYSTEM



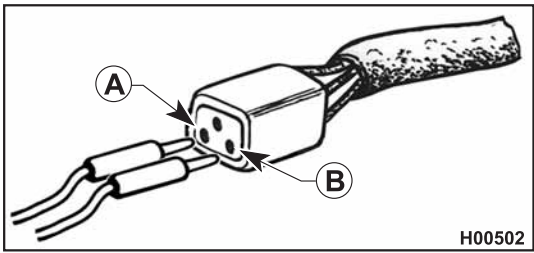
Carburettor throttle position sensor inspection

(TPS: Throttle Position Sensor) (TC)

Set the meter to the "Ohm" scale and disconnect the carburettor sensor connector (1) from the main wiring harness. Connect the meter probes to the terminals of the YELLOW (A) and BLACK (B) wires and check that your readings match the values given in the table.

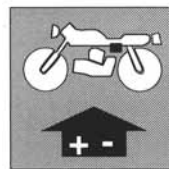


a	throttle twistgrip CLOSED	890-990 Ω
b	throttle twistgrip FULLY OPEN "KEIHIN" MX 37- MX 41	3.4-4.4 K Ω +/- 5%



- A Giallo
B Nero





BATTERY (TE - TXC)

The battery (1) is a sealed-for-life, maintenance-free battery. If the vehicle remains unused for long periods, it is recommended to disconnect the battery from the electrical system and store it in a dry place. After an intensive use of the battery, it is advisable to carry out a standard slow charging cycle (12V-6Ah battery: 0.6A for 8 hours).

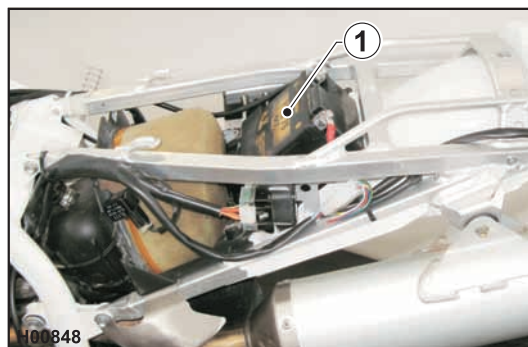
Quick charging is advised only in situations of extreme necessity since the life of lead elements is drastically reduced by such cycle (12V-6Ah battery: 6A for 0.5 hours).

Battery charger

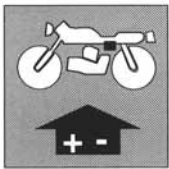
To gain access to the battery (1):

- remove the saddle (as outlined in the relevant paragraph);
- first remove the BLACK negative cable, then the RED positive cable (when reassembling, first connect the RED positive cable, then the BLACK negative cable);
- remove the battery (1) from its housing.

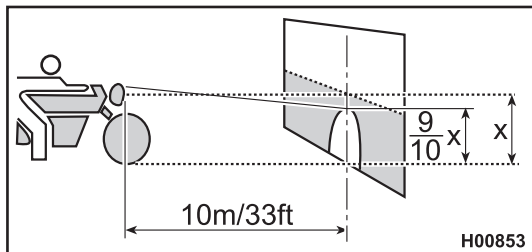
Check, using a voltmeter, that battery voltage is not less than 12.5 V. If it is not so, the battery needs to be charged. Using a battery charger with a constant voltage, first connect the RED positive cable to the battery positive terminal then the BLACK negative cable to the battery negative terminal. At a constant voltage level of 14.4 V, apply "x" Amps according the battery's charge percentage as indicated in the table below. The voltage reaches a constant value only after a few hours, therefore it is suggested NOT to measure it immediately after having charged or discharged the battery. Always check the battery charge before reinstalling it on the vehicle. The battery should be kept clean and the terminals coated with grease.



INDICATIVE CHARGE TIMES DEPENDING ON BATTERY CHARGE STATUS		
AT-REST VOLTAGE * (V)	% OF CHARGE	CHARGE TIME (RATED CURRENT IN AMPS TO BE APPLIED: 0.1x BATTERY RATED CAPACITY)
> 12.7	100	
~ 12.5	75	4h
~ 12.2	50	7h
~ 12.0	25	11h
~ 11.8	0	14h



ELECTRICAL SYSTEM



HEADLAMP, TAIL LIGHT (TE)

Headlamp adjustment

The headlamp features a twin bulb for low and high beam and a festoon bulb for the city or parking light. Beam setting needs to be performed accurately; proceed as follows:

- Place the motorcycle 10 metres away from a vertical wall;
- The motorcycle must be on level ground and the optical axis of the headlamp must be perpendicular to the wall;
- The motorcycle must be upright;
- Measure the height from the ground to the centre of the lamp and draw a cross on the wall at the same height;
- When the low beam is on, the upper edge between dark and lit zone should be at 9/10th of the height of headlamp centre from ground. Beam height can be raised or lowered turning the screw (1).



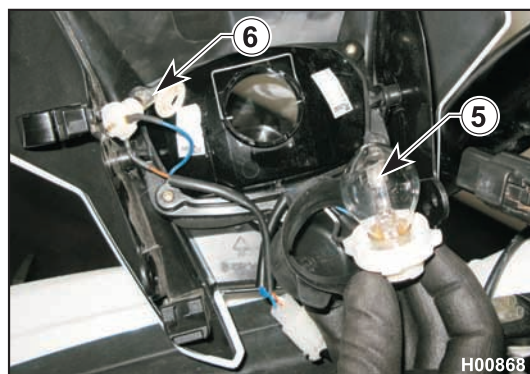
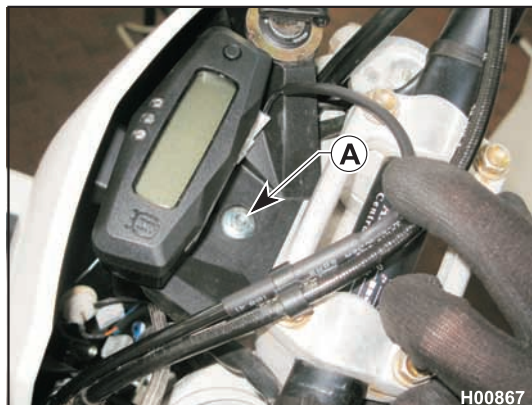
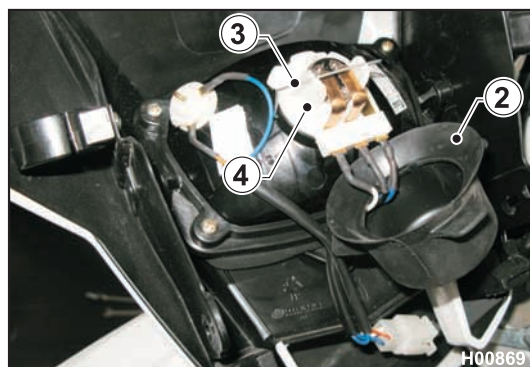
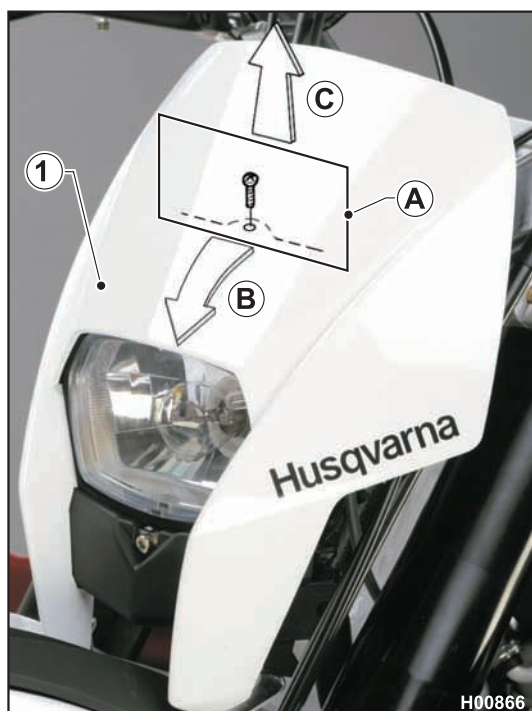
Headlamp bulbs replacement

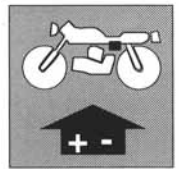
Proceed as follows to reach the headlamp bulbs:

- remove the upper retaining screw securing headlamp fairing to dashboard bracket (A);
- slide the headlamp fairing (B) forward and pull upwards (C) to ease it off the two lower mounts;
- remove the headlamp fairing (1);
- slide off the rubber boot (2);
- release the clip (3) and remove the bulb holder (4);
- remove the bulb (5).

To replace the parking light bulb (6) extract it from the inside cover.

Once the tail light has been replaced, reverse the above procedure to reassemble.





Tail light replacement

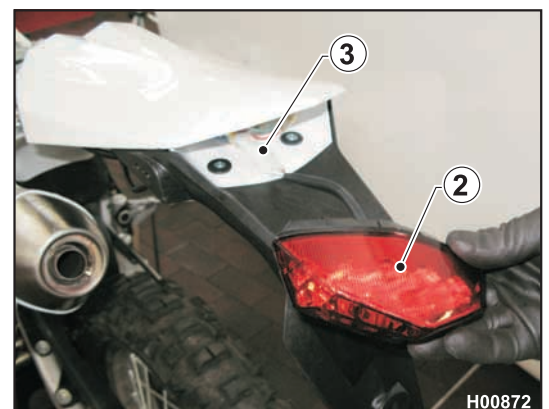
Remove the tail light as follows:

- Loosen the two screws (1) under the rear mudguard.
- Extract the tail light (2) and disconnect the connector (3).

Once the tail light has been replaced, reverse the above procedure to reassemble.



Be careful not to overtighten the screws.



Number plate bulb replacement

- Loosen screw (1) and remove the number plate bulb (2) from the mudguard.
- Extract the bulb holder (3) with the bulb (4) from the housing.
- Pull the bulb (4) to detach it from bulb holder.

Once the tail light has been replaced, reverse the above procedure to reassemble.





Left-hand switch (TC)


1 Engine stop switch (TC)

Left-hand switch (TE)

1.  High beam flasher (self-cancelling)

2. High beam switch

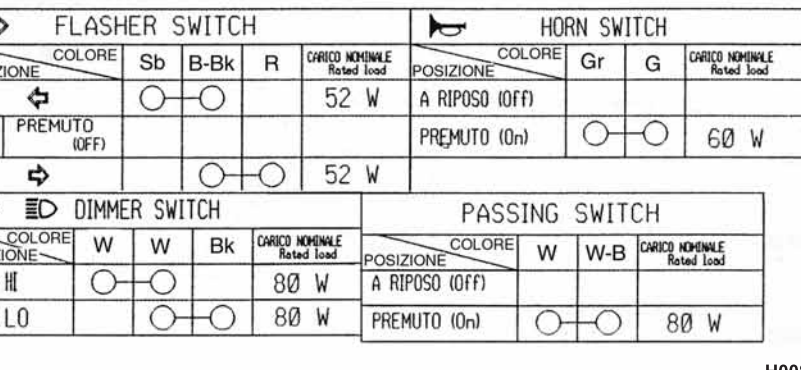
-  Low beam switch

3.  Left-hand turning indicators (self-cancelling)

- ➡ Right-hand turning indicators (self-cancelling)

To deactivate the turning indicators, press the control lever after it is returned to the centre.

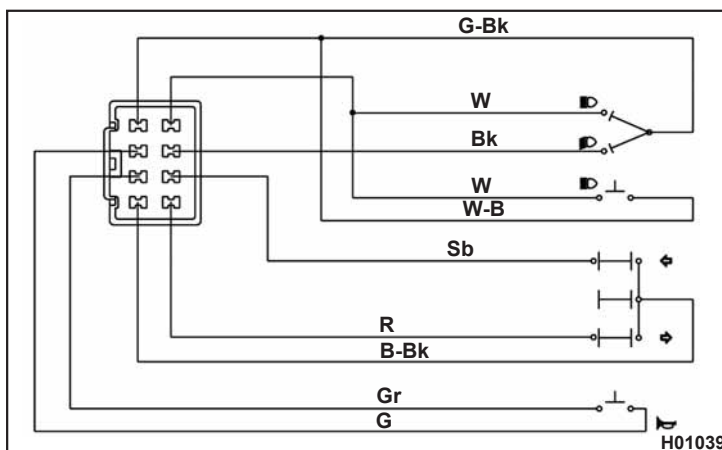
4. Horn.



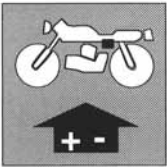
H00887

Colour coding key

B	Blue
Bk	Black
B-Bk	Blue-Black
B-W	Blue-White
G	Green
G-Bk	Green-Black
G-W	Green-White
Gr	Grey
Y	Yellow
R	Red
Sb	Sky blue
W	White
W-B	White-Blue
W-Bk	White-Black

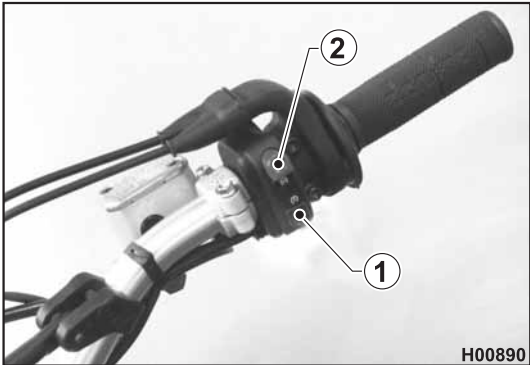


ELECTRICAL SYSTEM

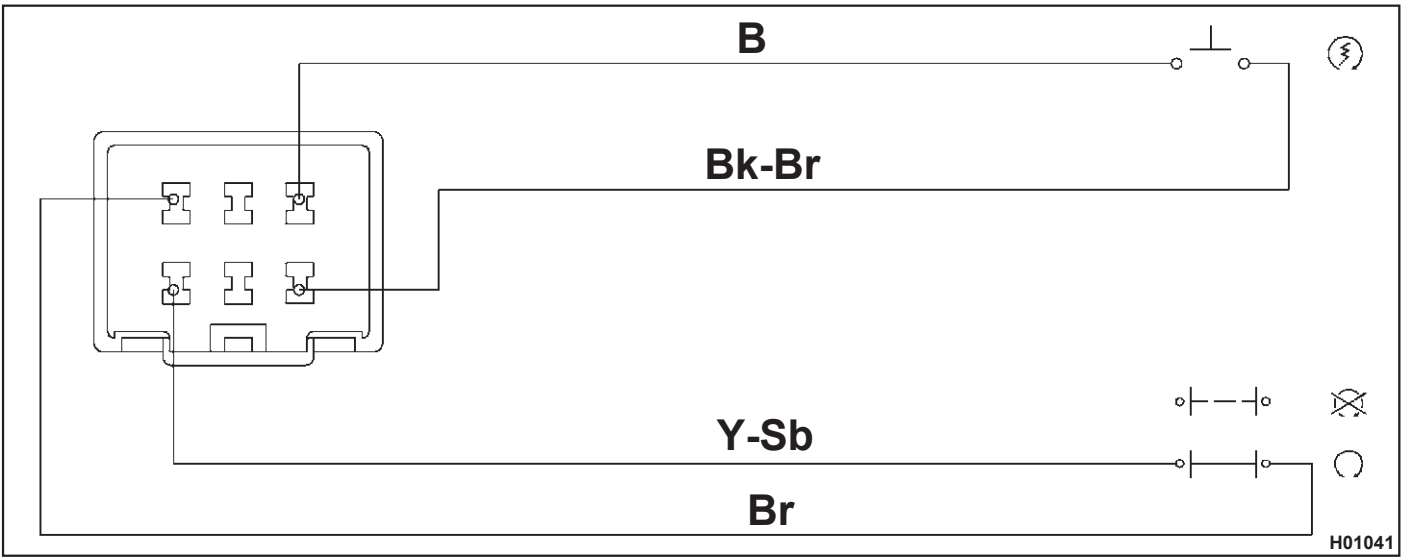


Right-hand switch (TE - TXC)

- 1. Engine start button
- 2. Engine start/stop switch



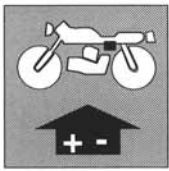
START SWITCH (⚡)				ENGINE STOP SWITCH (⊗/⊙)					
<div></div>	B I	Br/Bk	TENS. NOM. Nom. voltage	<div></div>			Br	Y/Sb	TENS. NOM. Nom. voltage
OFF				⊗					300V(12V)
ON	○	○	12V	⊙			○	○	300V(12V)
CORRENTE NOMINALE Current load 3 A				CORRENTE NOMINALE - Current load ⊗ = 0.6 A (3 A) ⊙ = 0.6 A (3 A)					



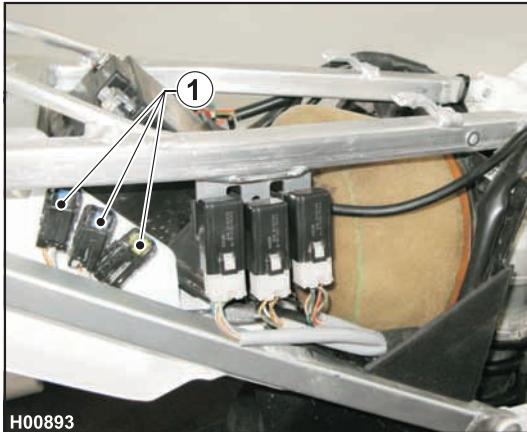
Colour coding key

- B Blue
- Br Brown
- Br-Bk Brown-Black
- Y-Sb Yellow-Sky blue





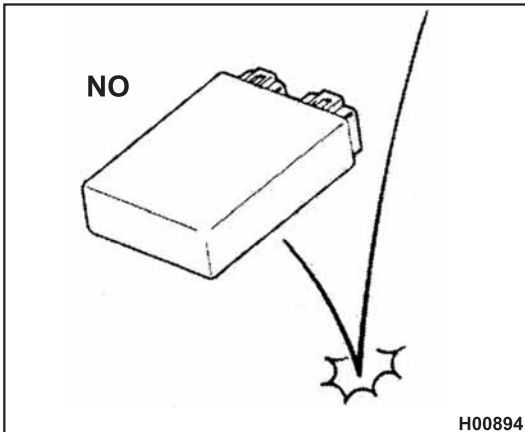
ELECTRICAL SYSTEM



H00893

FUSES

- When you find a blown fuse (1), always investigate and eliminate the cause before replacing it.
- Never replace a fuse with another fuse with a different rating.
- Never use a wire or other makeshift repair techniques instead of installing a new fuse.

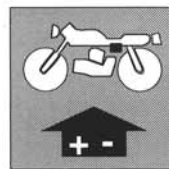


H00894

SEMICONDUCTOR PARTS

- Be careful to never drop parts that incorporate a semiconductor, such as the ECU or the voltage regulator/rectifier.
- Closely follow the relevant instructions when inspecting these parts. An improper procedure may lead to severe damage.





DIGITAL DASHBOARD, WARNING LIGHTS (TE)

The motorcycle is fitted with a digital dashboard on which 3 warning lights are also available for: high beam, turning indicators and fuel reserve.

- 1- BLUE warning light "High beam"
- 2- GREEN warning light "Turning indicators"
- 3- ORANGE warning light "Fuel reserve" (2.3 l)

When the ignition key is turned to the IGNITION position, the dashboard display lights up (amber colour).

NOTE:

- At every connection with the battery, the dashboard shows the version of the test SW for the first 2 seconds; after the check routine, the dashboard shows the last planned function.
- When the engine is turned off, the dashboard does not show any functions.
- To select dashboard functions and reset functions, use the SCROLL button (A)

The functions available, in the sequence, are as follows:

- 1- SPEED / ODO
- 2- SPEED / CLOCK
- 3- SPEED / TRIP
- 4- SPEED / LAP TIMER
- 5- SPEED / RPM (engine r.p.m. numerical value)
- 1- SPEED / ODO

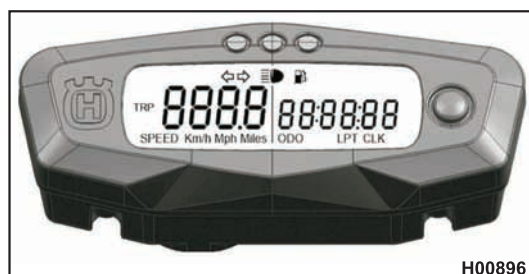
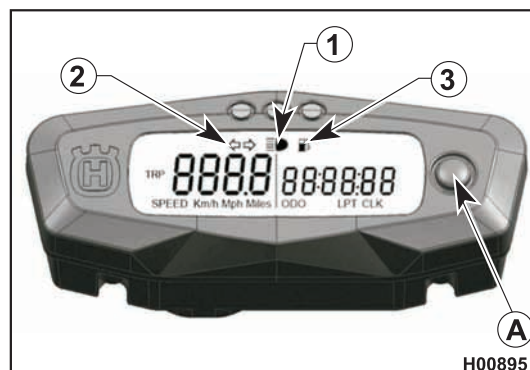
IMPORTANT: In the event of a FUEL INJECTION SYSTEM MALFUNCTION, the word FAIL appears on the right side of the dashboard display (see page 14).
When this is the case, contact your HUSQVARNA dealer.

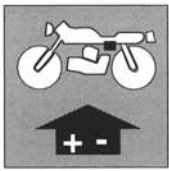
1- SPEED (Km/h or mph) / ODO (figure 1)

- SPEED: vehicle speed - maximum value: 299 Km/h or 299 mph;
- ODO: odometer - maximum value: 99999 Km.

To change unit from kilometres to miles or miles to kilometres, proceed as follows:

- 1) set to figure 1, turn the key to OFF and push SCROLL (A);
- 2) place the ignition key in the IGNITION position and hold down the SCROLL button (A) until the word "Km/h" is displayed;
- 3) the display will now alternate between "Km/h" and "Mph Miles", push the SCROLL button (A) again while the desired unit is displayed.





ELECTRICAL SYSTEM



2 - SPEED / CLOCK (figure 2)

- SPEED: speed - maximum value: 299 Km/h or 299 mph;
- CLOCK: clock - reading from 0:00 to 23:59:59.

To reset the clock, push the SCROLL button (A) and hold for more than 3 seconds in order to increase the hour value; release button and after 3 seconds the minutes can be increased;



3 - SPEED / TRIP 1 (figure 3)

- SPEED: speed - maximum value: 299 Km/h or 299 mph
- TRIP 1: distance - maximum value: 999.9 km or 621,31 mi (data will be lost after disconnecting the battery).

To reset TRIP, push the SCROLL button (A) and hold for more than 3 seconds.



4 - SPEED / LAP TIMER (STP) (figure 4)

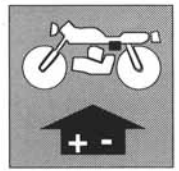
- SPEED: speed - maximum value: 299 Km/h or 299 mph;
- STP 1: miles/kilometres covered time
- Reading from 0:00 to 99:59:59 (data will be lost after disconnecting the battery).

To activate the function STP, push the SCROLL button (A) and hold for more than 3 seconds.

- 1st step: activate function;
- 2nd step: stop counters.
- 3rd step: reset STP;
- 4th step: activate function;
- 5th step: stop counters.

.....
and so on.





5 - SPEED / NUMBER of RPM (figure 5)

- SPEED: speed - maximum value: 299 Km/h or 299 mph
- NUMBER OF RPM: MIN. 500, MAX 14250

The display also provides a "Neutral" and a fuel injection "Fail" indication; **the latter takes priority over any other indication.**

NEUTRAL: when running speed is under 20 Km/h, a "Neutral" condition is indicated by a letter N placed before the speed value.

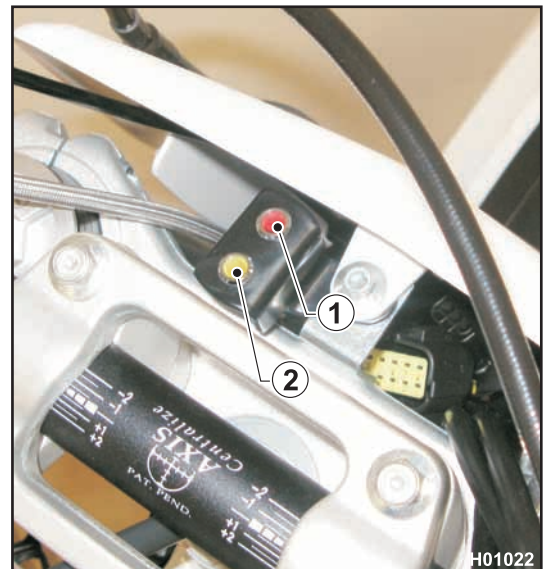
FAIL: a "FUEL INJECTION SYSTEM MALFUNCTION" indicated by the word "FAIL" appearing in the right-hand portion of the dashboard display.

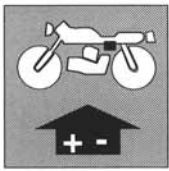


Warning lights panel (TXC)

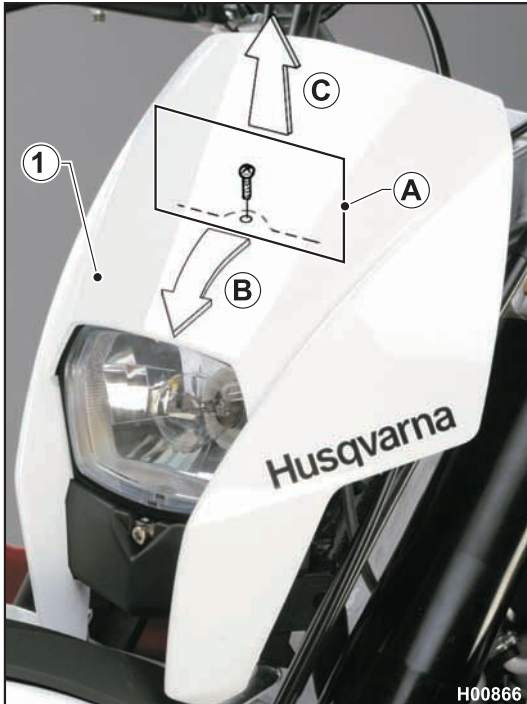
The motorcycle is fitted with a small warning lights panel with two warning lights:

- 1 - Red warning light "POWER"
- 2 - Yellow warning light "FUEL RESERVE"





ELECTRICAL SYSTEM



Dashboard replacement (TE)

- Remove the upper retaining screw securing headlamp fairing to dashboard bracket (A);
 - slide the headlamp fairing (B) forward and pull upwards (C) to ease it off the two lower mounts;
 - disconnect the connector (2) and remove the headlamp fairing (1);
- Remove the two retaining screws (3) securing the dashboard to its bracket, disconnect the connector (4) and remove the dashboard (5). To refit the dashboard, reverse the disassembly procedure.

TROUBLESHOOTING

CHARGING SYSTEM (TE - TXC)

A battery that does not hold charge might be a symptom of:

- 1) current loss (see paragraph "Current loss at the battery");
- 2) incorrect voltage (see paragraph "Regulated voltage");
- 3) no continuity in generator (see paragraph "Checking generator stator windings resistance");
- 4) incorrect no-load performance of generator (see paragraph "Generator no-load performance");
- 5) voltage regulator malfunction (see paragraph "Voltage regulator/rectifier inspection")

- a battery overload indicates:

- 1) faulty voltage regulator (see paragraph "Voltage regulator/rectifier inspection");
- 2) faulty battery (see paragraph "Current loss at the battery").

STARTING SYSTEM (TE - TXC)

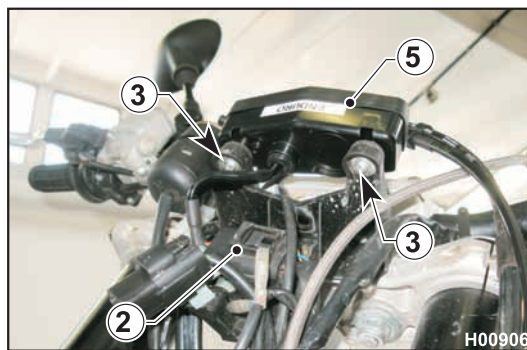
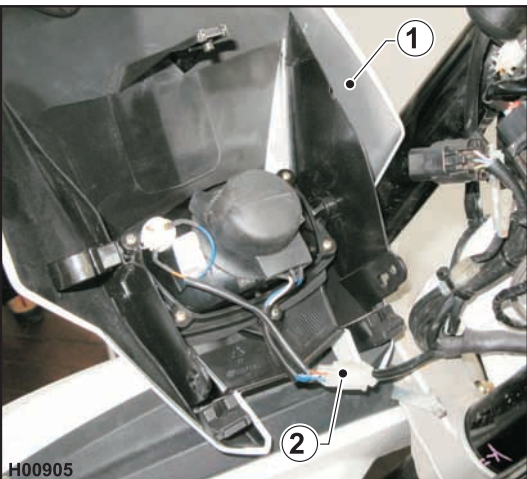
If the starter motor does not start, this might be a symptom of:

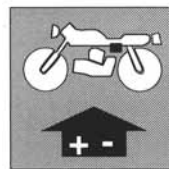
- 1) faulty solenoid starter (see paragraph "Solenoid starter inspection");
- 2) loose starter motor cable;
- 3) faulty starter motor (see paragraph "Starter motor inspection");
- 4) flat battery (see paragraph "Battery charger").

ELECTRONIC IGNITION SYSTEM

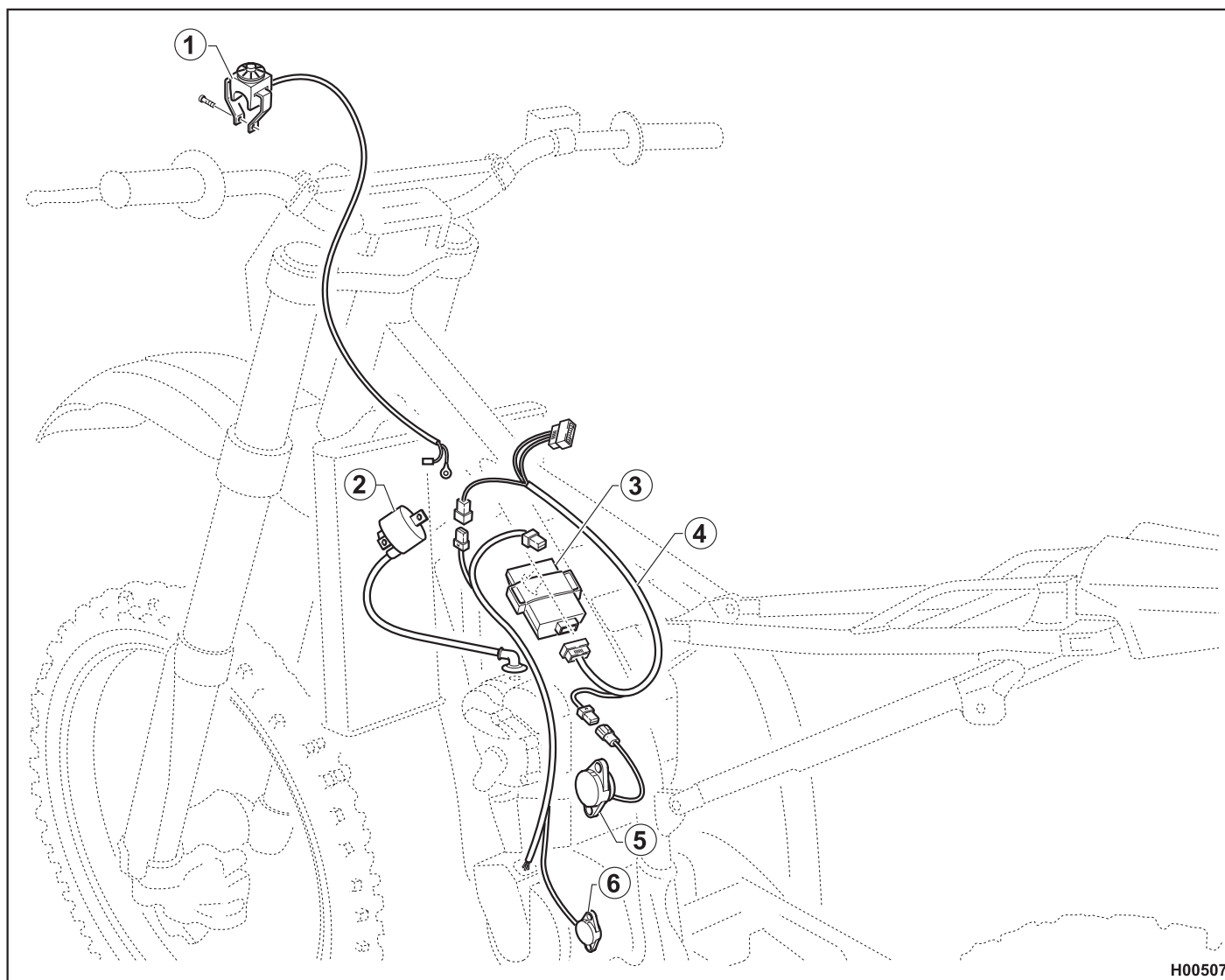
A weak or missing spark might be a symptom of:

- 1) incorrect connections in the electrical system;
- 2) faulty spark plug or wrong heat rating or incorrect spark plug gap (see paragraph "Spark plug");
- 3) faulty ignition coil (see paragraph "Checking coil windings resistance");
- 4) faulty spark plug cap (see paragraph "Checking coil windings resistance").



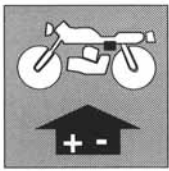


Wiring (TC)

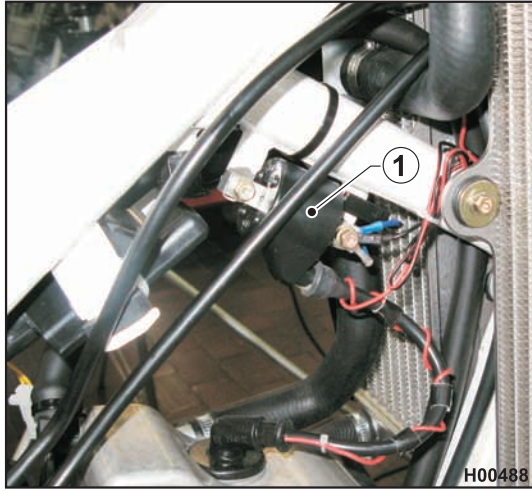


- 1 Engine stop button
- 2 Coil
- 3 Control unit
- 4 Main wiring harness
- 5 Carburettor throttle position sensor
- 6 Gear sensor





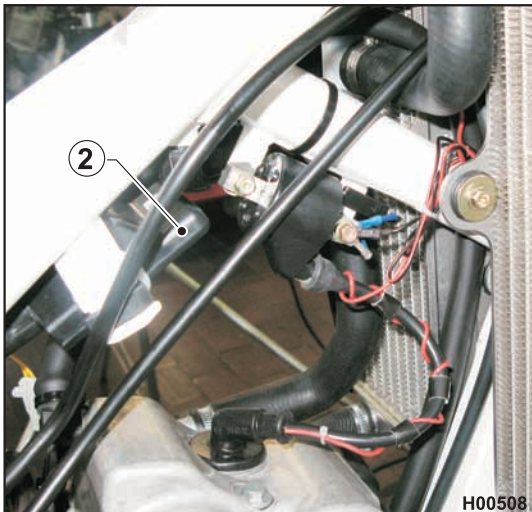
ELECTRICAL SYSTEM



Cable routing and electrical parts installation instructions (TC)

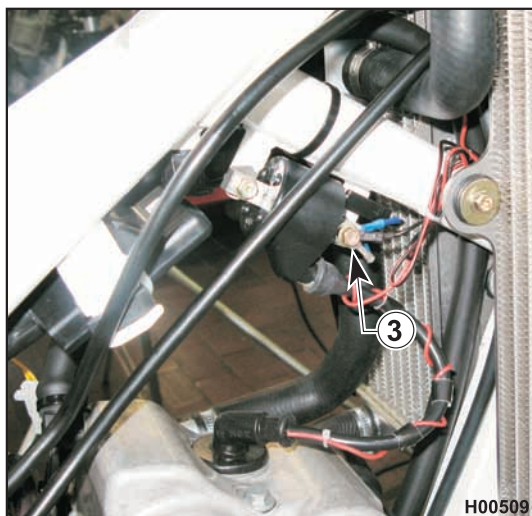
- **HT coil position (1) (TC)**

Connect the HT coil as shown in the figure.



- **Fuel injection control unit position (2) (TC)**

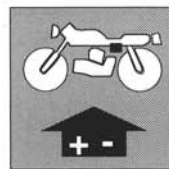
Electronic control unit installed with the flat side down.



- **Securing engine stop button ground cable to chassis (TC)**

The ground cable of the engine stop button is secured to the coil screw (3).





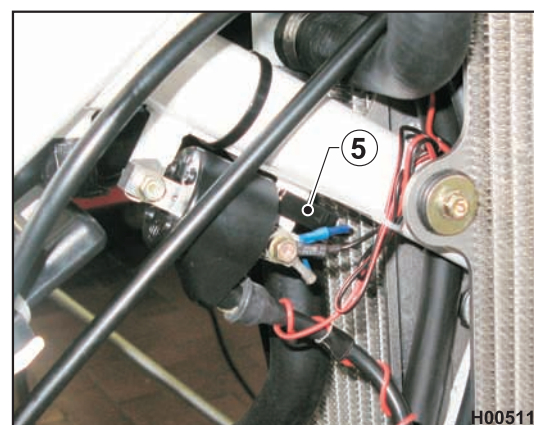
- **Control unit connection (TC)**

Connect the control unit connector (4) as shown.



- **Ignition coil connection (TC)**

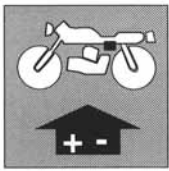
Connect the ignition coil connectors (5) as shown.



- **Gear sensor cable connection (TC)**

Connect the gear sensor connector (6) as shown.



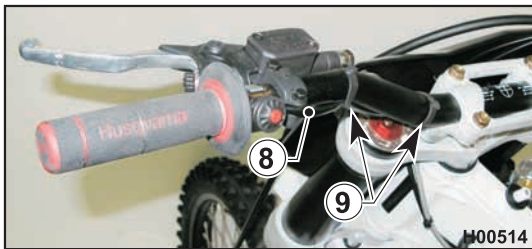


ELECTRICAL SYSTEM



- **Securing the wiring (TC)**

Strap wiring to chassis with three clips (7) as shown in the figure.



- **Securing the engine stop button cable (TC)**

Secure the engine stop button cable (8) with two clips (9).

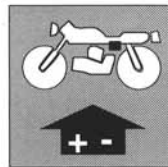


- **Securing the wiring (TC)**

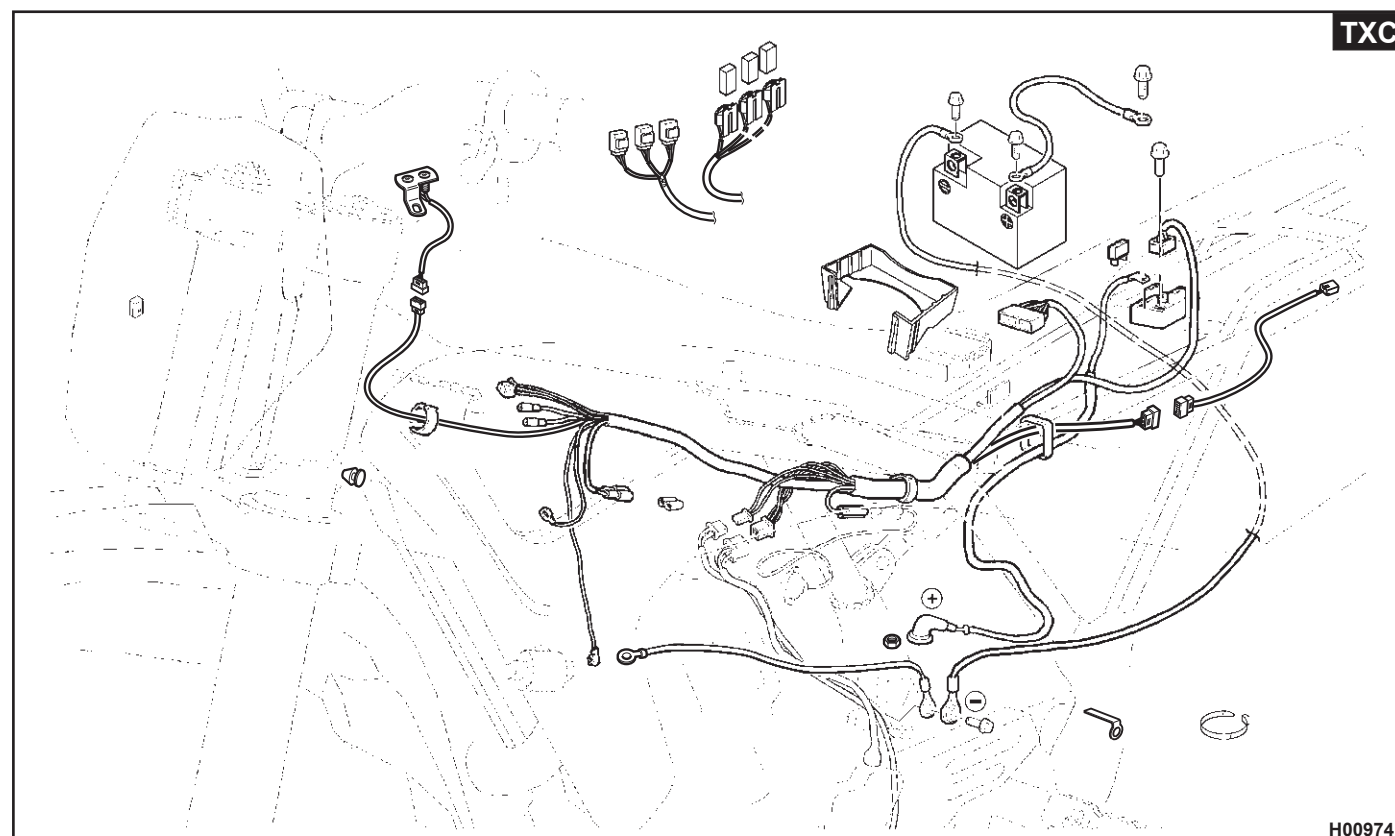
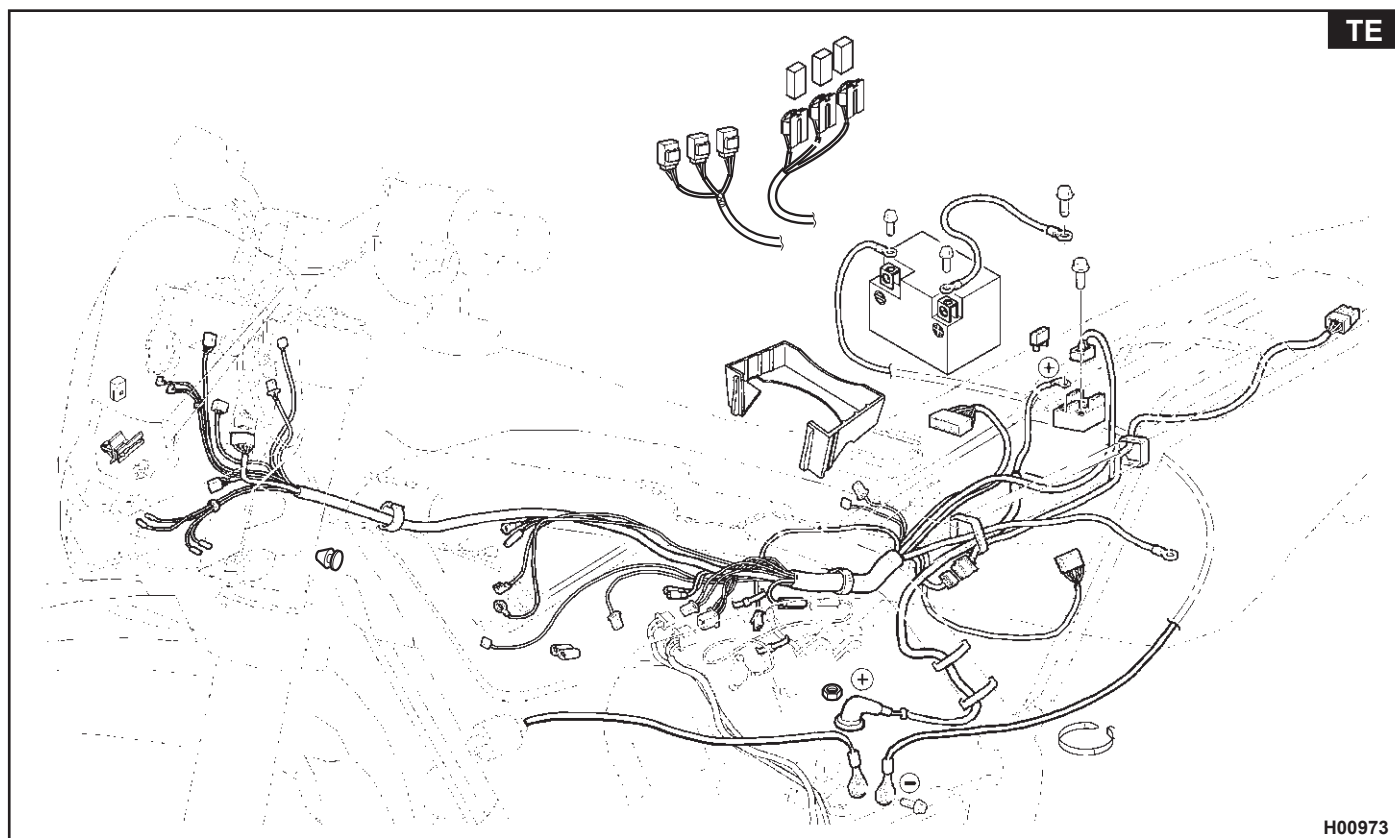
Secure the ignition and gear sensor wiring loom to the clutch hose.

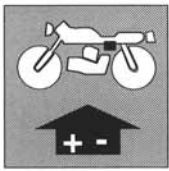


ELECTRICAL SYSTEM



Wiring (TE - TXC)



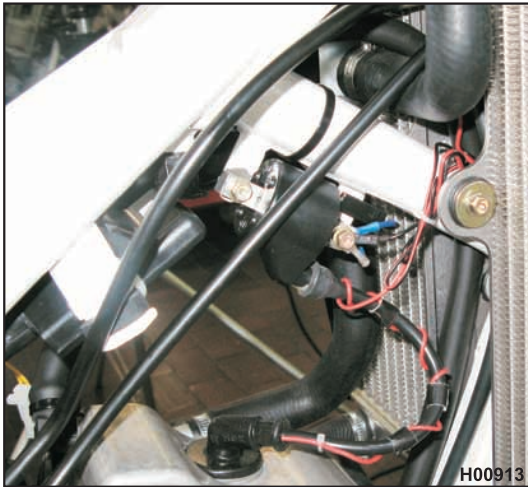


ELECTRICAL SYSTEM

CABLE ROUTING AND ELECTRICAL PARTS INSTALLATION INSTRUCTIONS "TE - TXC"

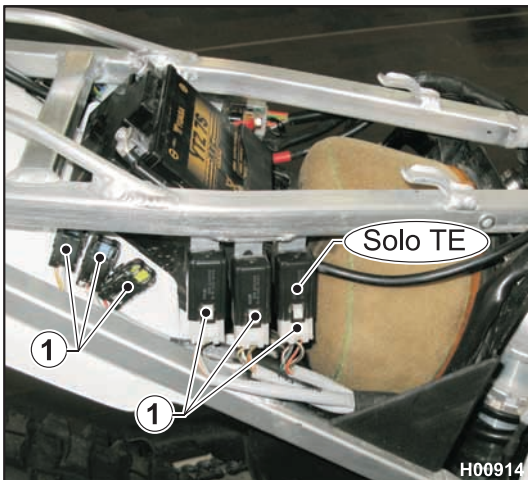
- **Coil position TE -TXC**

Connect the HT coil as shown in the figure.



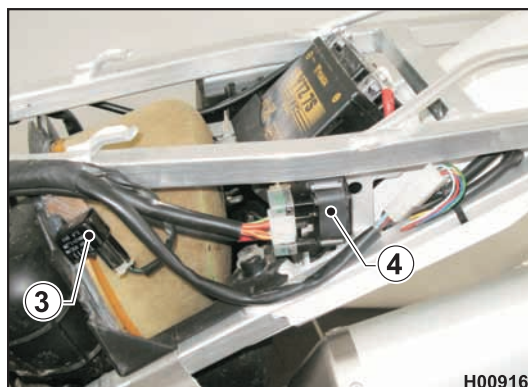
- **Relay (1) and fuses (2) position (TE - TXC)**

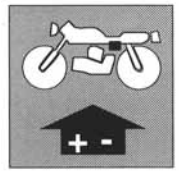
On right side of motorcycle.



- **Turning indicators flasher (3) (TE) and solenoid starter position (TE - TXC)**

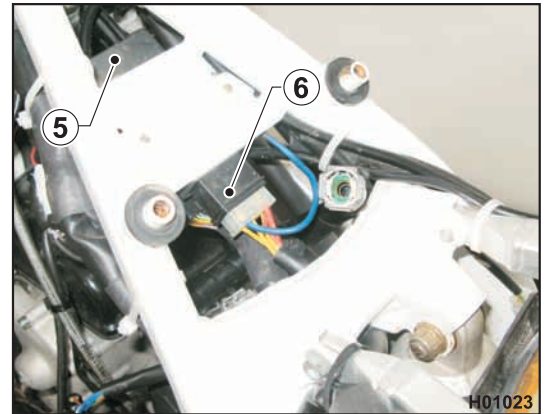
On left side of motorcycle.





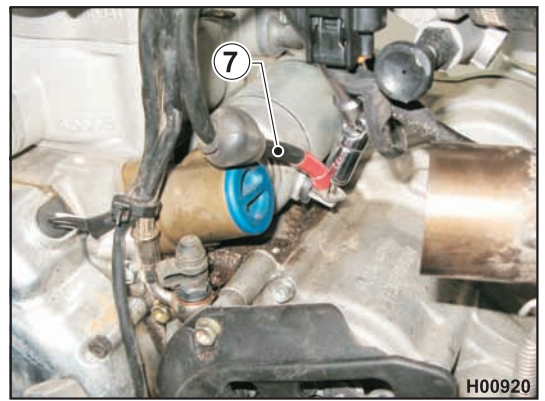
- **Electronic control unit (5) and voltage regulator (6) position (TE - TXC).**

Electronic control unit installed with the flat side down.
Voltage regulator installed over the electronic control unit.
Coat voltage regulator with heat grease.



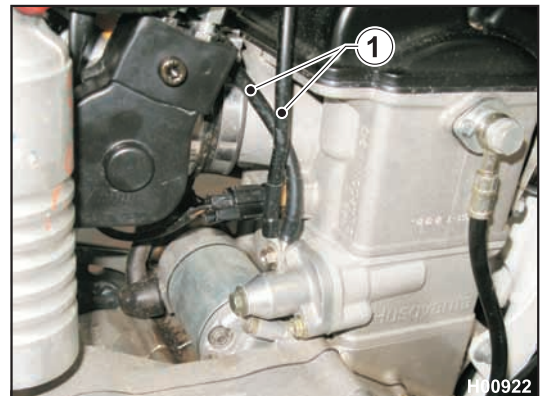
- **Securing the starter motor/solenoid starter cable (TE - TXC)**

Connect the starter motor/solenoid starter cable (7) as shown in the figure.



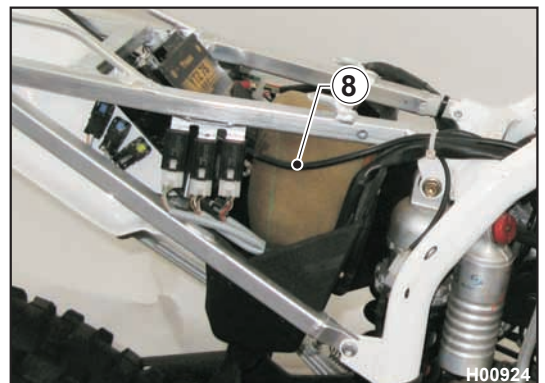
- **Securing the engine ground to chassis and engine ground to battery cables (8) (TE - TXC)**

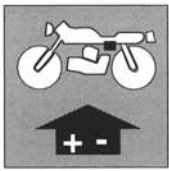
The engine ground to chassis and engine ground to battery cables are secured to the timing chain tensioner screw.



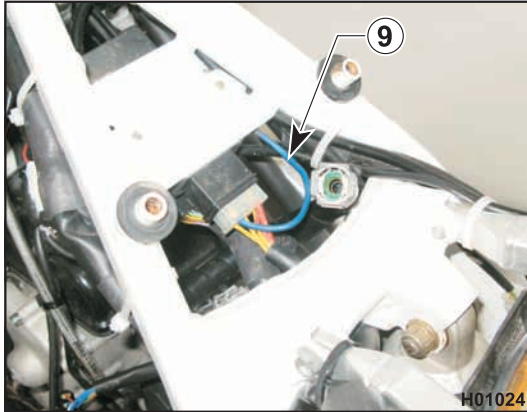
- **Battery negative cable routing (TE - TXC)**

Routing of engine ground to battery negative cable (8).





ELECTRICAL SYSTEM



- **Securing the voltage regulator ground cable (9) (TE - TXC)**

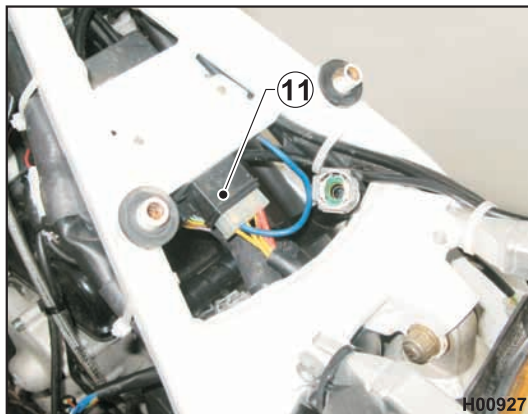
Secure the regulator ground cable to the right-hand screw of the injection coil.



- **Securing the engine ground / chassis ground cables (10).**

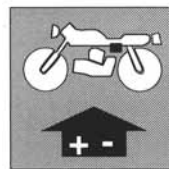
Electrical system ground

Secure the engine ground / chassis ground cable and the wiring harness ground eye terminal to the coil retaining screw.



- **Wiring connection to voltage regulator (TE - TXC)**

Connect the connector (11) to the regulator. Pay attention to the routing of radiator breather hose and throttle cables.



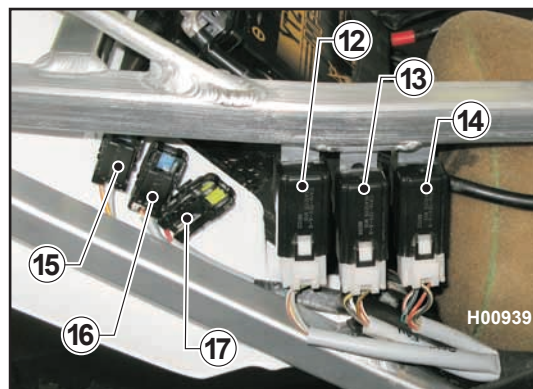
• Connection of relays and fuses (TE - TXC)

RELAYS

- Connect the cable marked "POW" to relay (12)
- Connect the cable marked "FAN" to relay (13)
- Connect the cable marked "DC" to relay (14) (TE only)

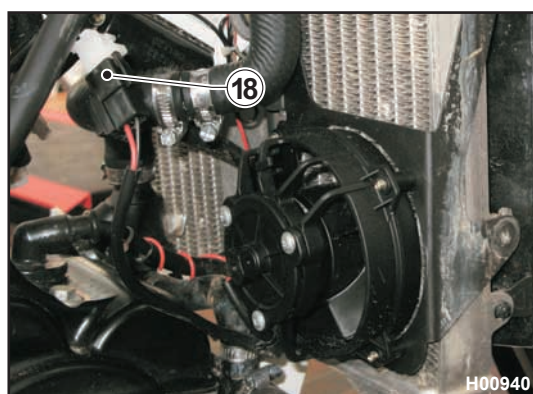
FUSES

- Connect the cable marked "POW" to fuse (15)
- Connect the cable marked "MAN" to fuse (16)
- Connect the cable marked "FAN" (TXC) to fuse (17)
- Connect the cable marked "DC+FAN" (TE) to fuse (17)



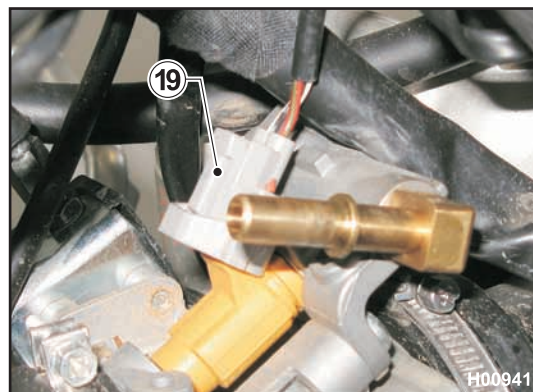
• Electric fan connection (TE - TXC)

- Connect the electric fan connector (18).



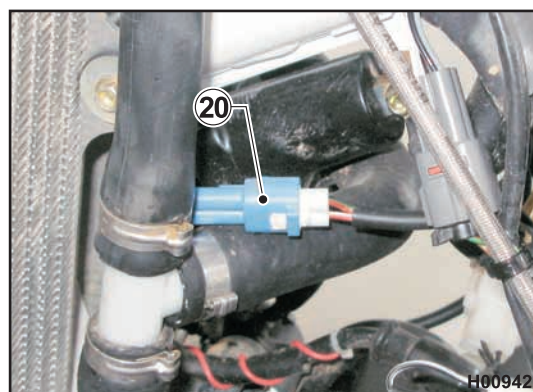
• Injector connection (TE - TXC)

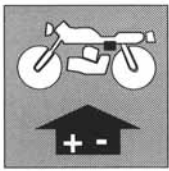
- Connect the connector (19) to the throttle body.



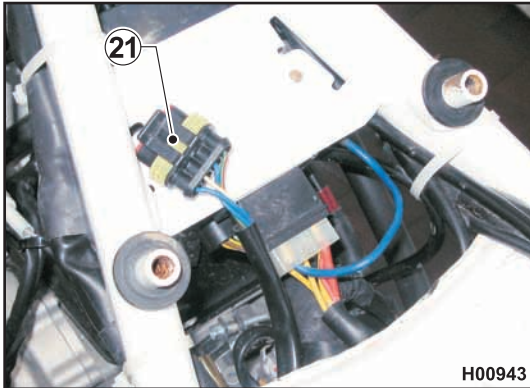
• Ignition coil connection (TE - TXC)

- Connect the ignition coil connector (20) as shown.

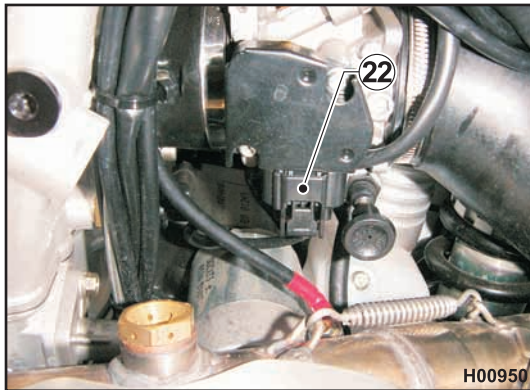




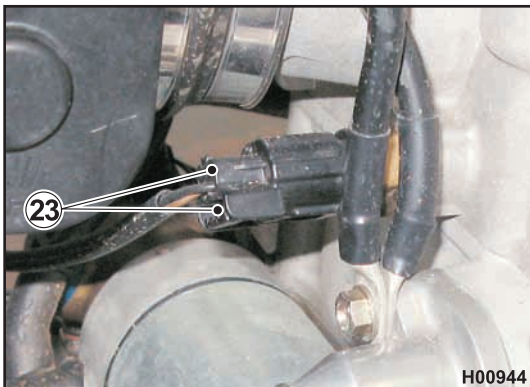
ELECTRICAL SYSTEM



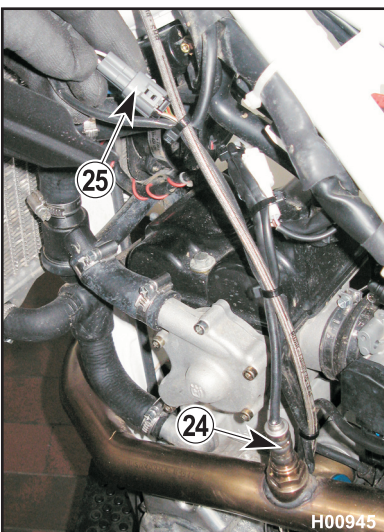
- **Fuel pump connector position (TE -TXC)**
Position the fuel pump connector (21) as shown.



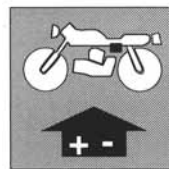
- **MAQS connector (TE - TXC)**
Connect the connector (22) as shown.



- **Engine water temperature connector (TE - TXC)**
Connect the engine water temperature connectors (23) to the thermostat.

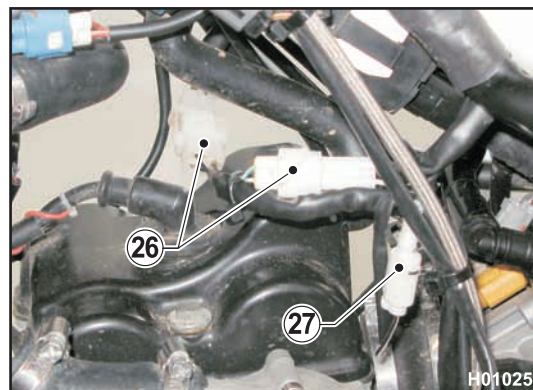


- **Lambda sensor position and connector (TE - TXC)**
Tighten the Lambda sensor (24) in the corresponding seat.
Connect the Lambda sensor connector (25) as shown.



- **Ignition and gear sensor cable connection**

Connect the ignition (26) and gear sensor (27) connectors as shown.

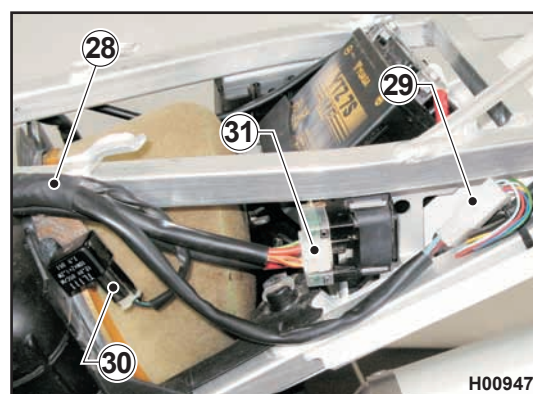


- **Routing of rear chassis cables, tail light connection, flasher contactor.**

Route the rear end of the wiring (28) as shown in the figure.

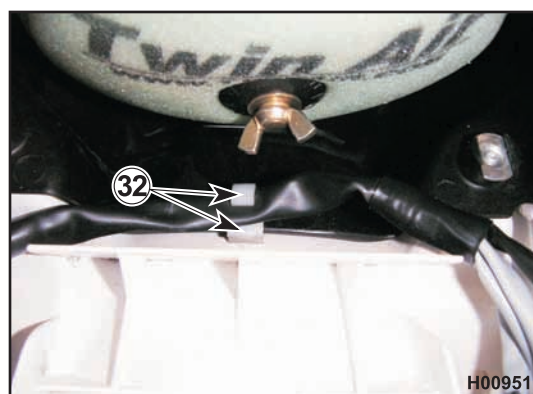
Connect the tail light/turning indicators connector (29) (TE).

- Connect the connector (30) to the flasher (TE).
- Connect the connector (31) to the solenoid starter.



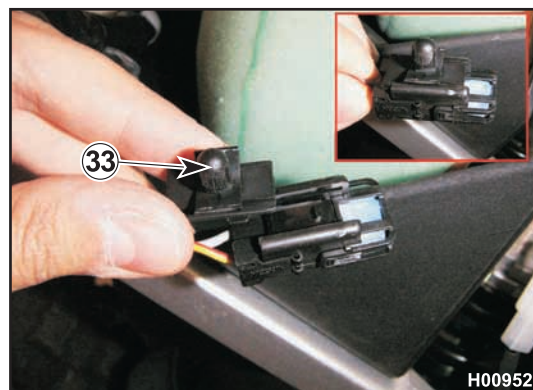
- **Air box cable routing**

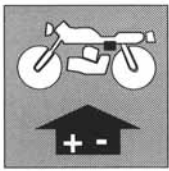
Route the wiring harness as shown. Secure it with the suitable clip (32).



- **Clip installation on fuse holders**

Install the suitable clips (33) on the three fuse holders.



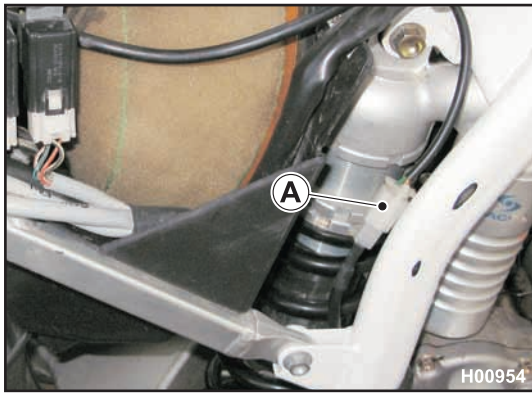


ELECTRICAL SYSTEM



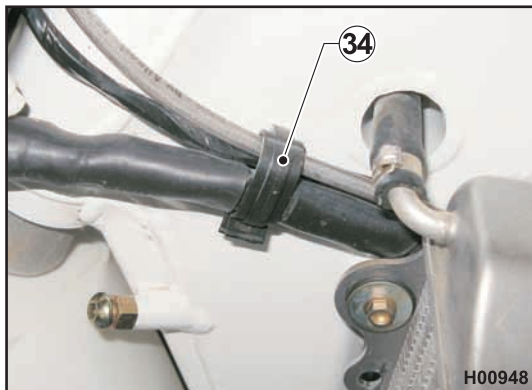
- **Clip installation on fuse holders**

Secure the three fuses to the suitable perforated panel of the rear mudguard.



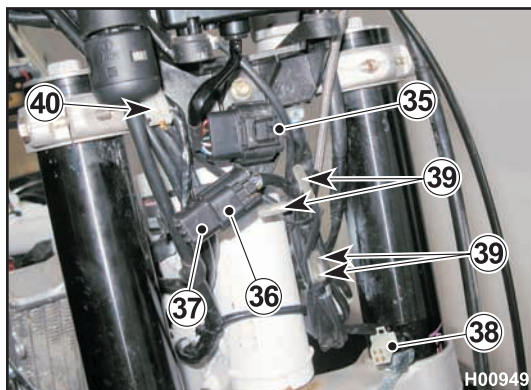
- **Rear stop connection**

Connect the wiring connector (A) to the rear STOP sensor.



- **Routing of steering head tube wiring**

Secure the wiring harness with the suitable clip (34).



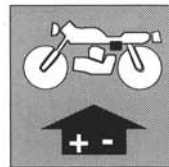
- **Dashboard bracket connectors (TE)**

Secure the dashboard (35) and diagnostic (36) connector using the suitable clips. Fit the cap (37) to the diagnostic connector (36).

- **Headlamp, front turning indicators, STOP connection (TE)**

Connect the headlamp unit to the connector (38).
Connect the connectors (39) to the turning indicators.
Connect the connector (40) to the front brake lever.





- **Double map connector cap (TE)**

Fit the cap to the double map connector.



H00955

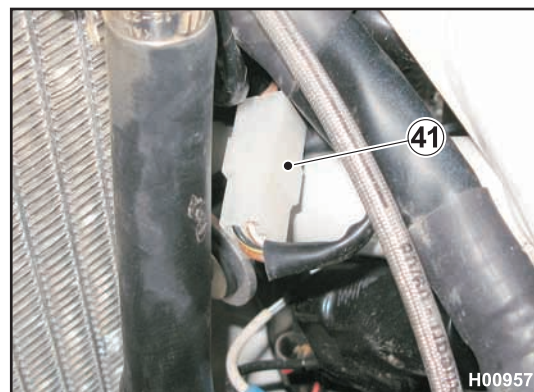
- **Speed sensor and ignition switch connectors (TE)**

Connect the speed sensor connector.

Connect the connector (41) of the ignition switch (42).



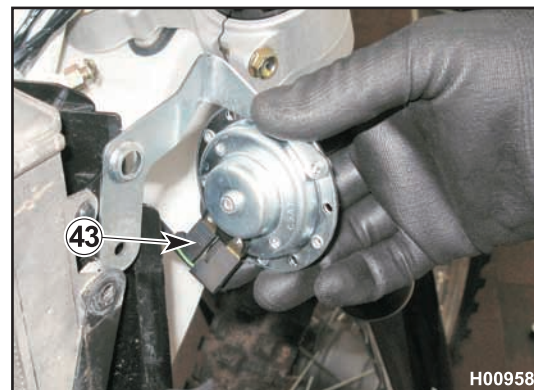
H00956



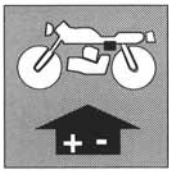
H00957

- **Horn connector (TE)**

Connect the connector (43) to the horn.



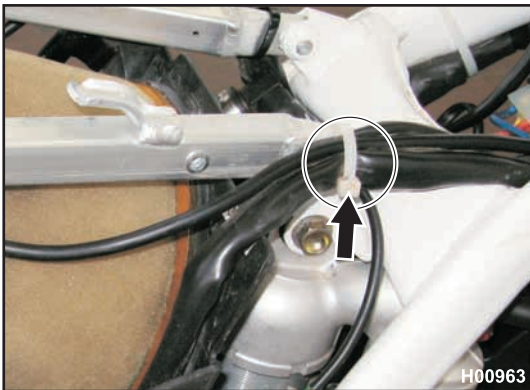
H00958



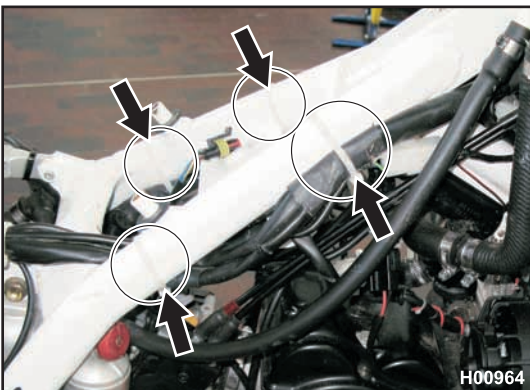
ELECTRICAL SYSTEM



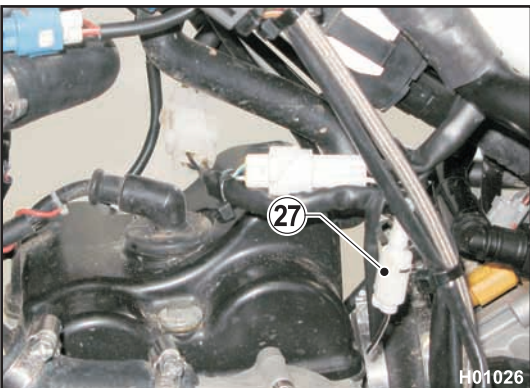
- **Securing the wiring harness to rear chassis right side**
Strap wiring to rear chassis with clips as shown in the figure.



- **Securing the wiring harness to rear chassis left side**
Secure wiring harness with a clip as shown in the figure.

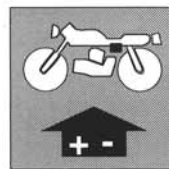


- **Securing the wiring harness to the chassis**
Strap wiring harness to chassis on right and left side with clips as shown in the figure.



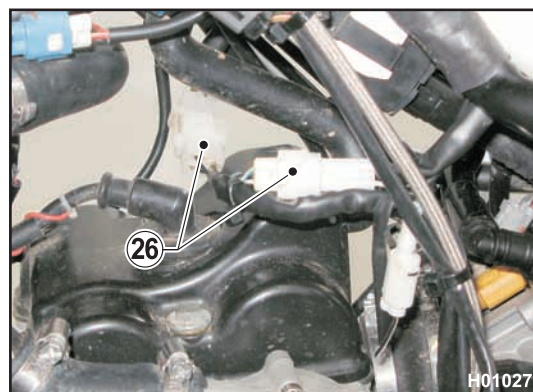
- **Securing the wiring harness**
Position the GPS and Pick-Up connectors (27) as shown.





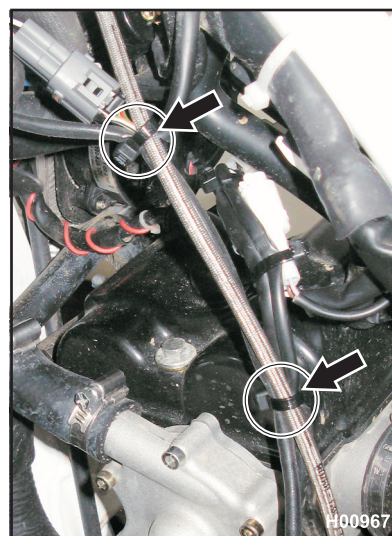
- **Securing the wiring harness**

Secure the generator connector as shown (26).



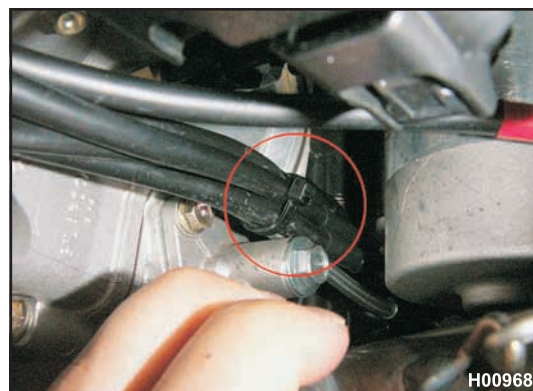
- **Securing the wiring harness**

Secure the ignition, gear sensor and Lambda sensor wiring loom to the clutch hose with two clips.



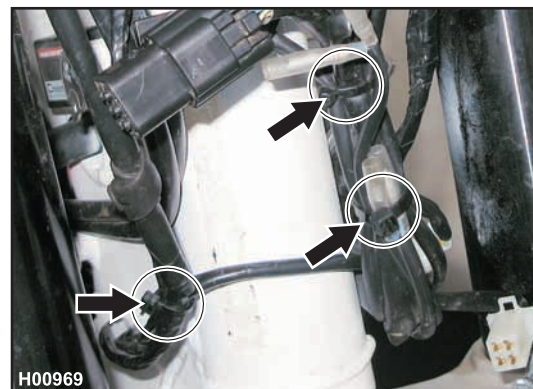
- **Securing the wiring harness**

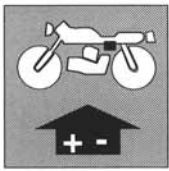
Secure the ignition and gear sensor wiring loom to the clutch hose.



- **Securing the wiring harness**

Secure the front wiring loom with two clips as shown.





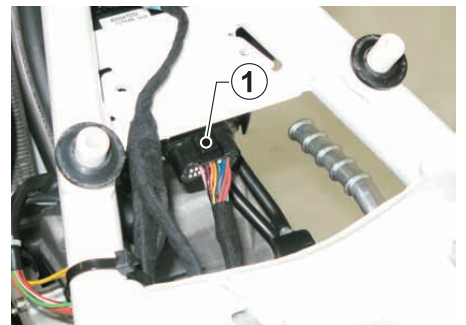
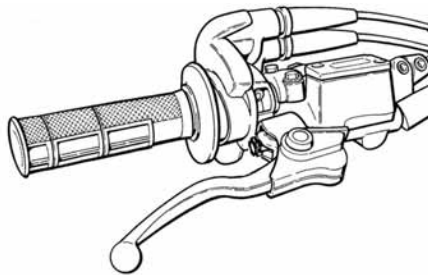
ELECTRICAL SYSTEM

IMPORTANT

Before washing the motorcycle, it is necessary to duly protect the following parts from water:

- a) Rear opening of the muffler;
- b) Clutch and front brake levers, handgrips, handlebar switches;
- c) Air filter intake;
- d) Steering head, wheel bearings;
- e) Rear suspension drag drop link.

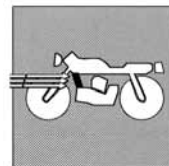
In addition to these precautions, **NEVER ALLOW HIGH-PRESSURE AIR OR WATER** to get in contact with any **ELECTRICAL PARTS**, the **INJECTION FUEL FEEDING SYSTEM**, and especially the electronic control unit (1).



H00564



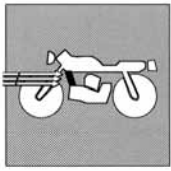
ENGINE COOLING



Section

N

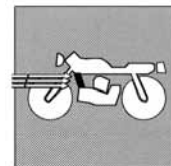




ENGINE COOLING

Coolant level check	N.3
Cooling circuit (TC).....	N.4
Engine cooling system overhaul (TC).....	N.5
Cooling circuit (TE-TXC).....	N.6
Engine cooling system overhaul (TE-TXC)	N.7





Coolant level check

Coolant takes the heat from the piston-cylinder-and-head assembly and transfers it to the radiator, where it is released to the atmosphere. Checking coolant level at regular periods is critical to ensuring proper operation of the cooling system.



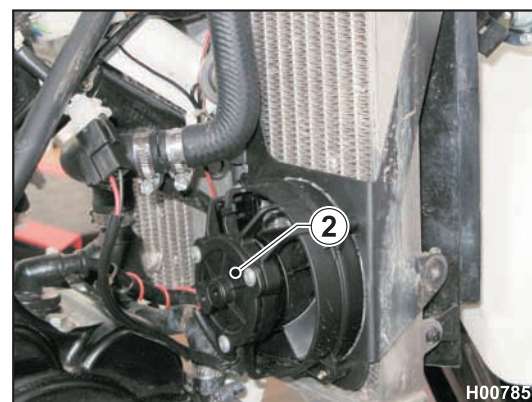
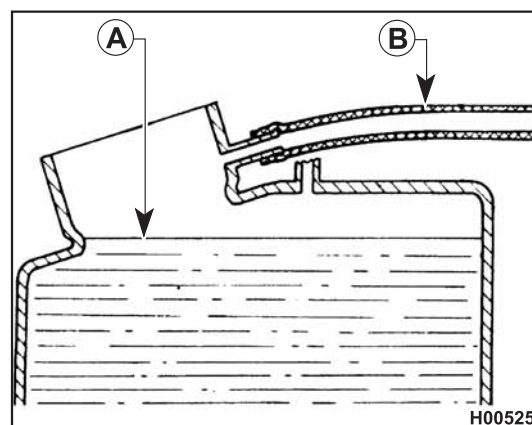
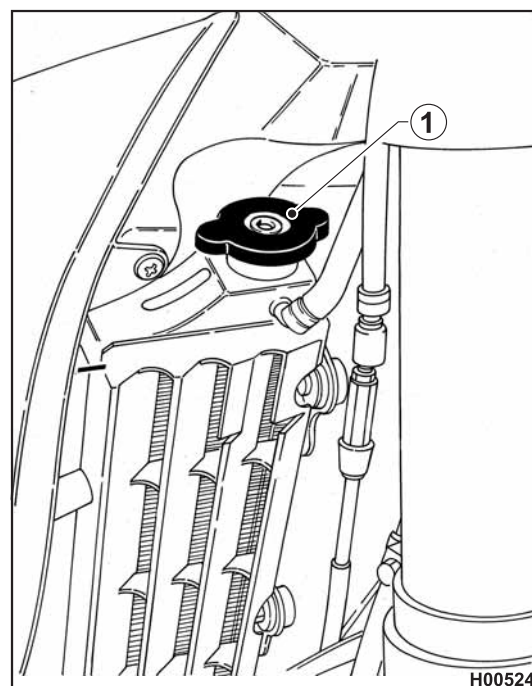
Without cooling medium (water), no heat exchange occurs between cylinder head and radiator. The cylinder and piston assembly will overheat and seize and in the worst scenario, crankshaft damage may result.

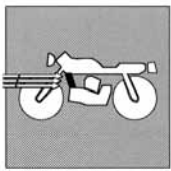
If the event of engine overheating, check that the radiator is full. Level in the radiator must be checked from cold (see Section D). In the event you need to check level when the engine is hot, be sure to discharge pressure gradually. The radiator cap (1) has a pressure-relief position to depressurize the system safely.



Failure to follow the above instructions will create a risk of scalding for operator and any persons standing nearby.
TE-TXC: Because the cooling fan (2) can be activated even when the start switch is in OFF position, always keep at a safe distance from the fan blades.

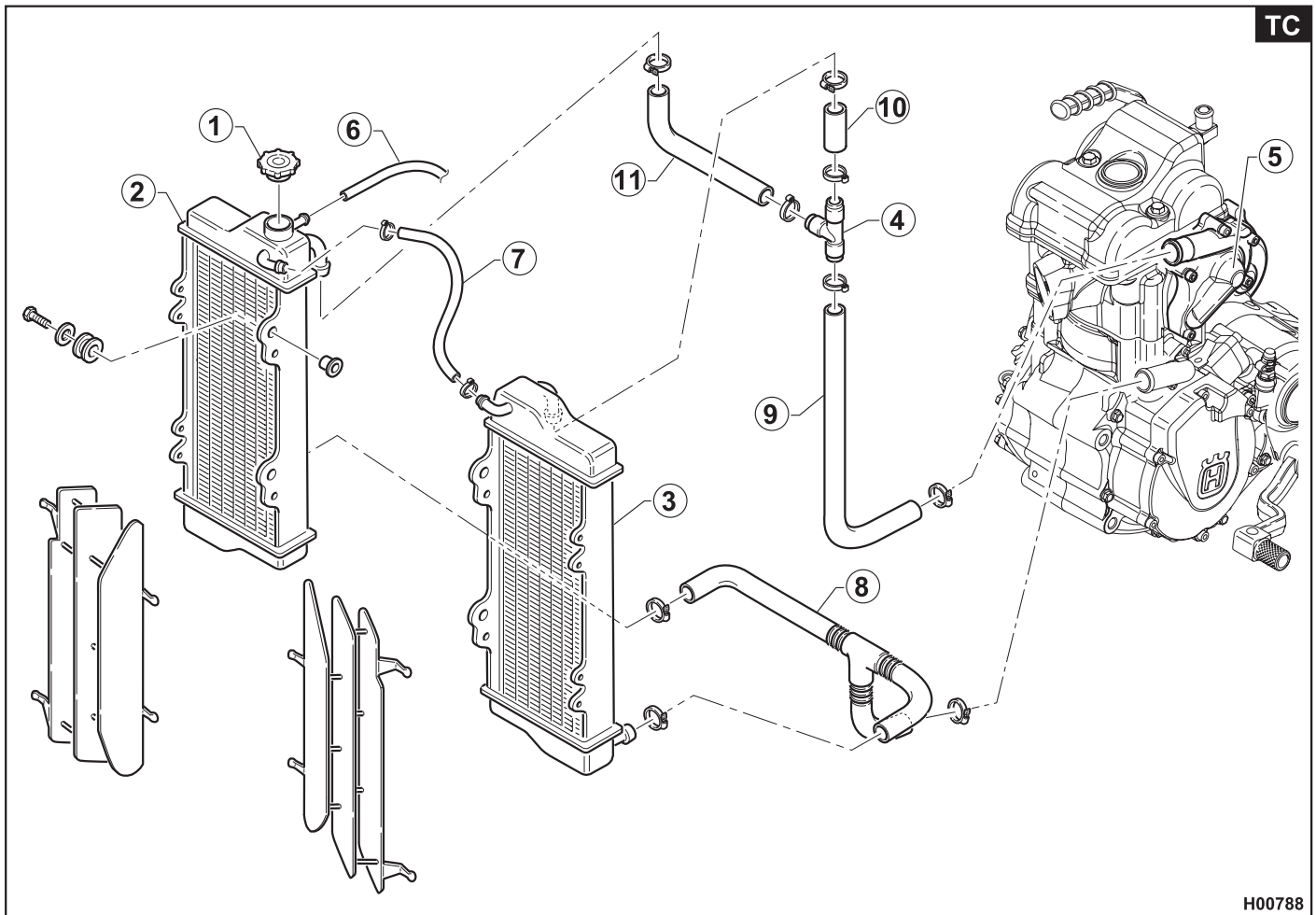
- A. Coolant level
- B. Breather hose





ENGINE COOLING

Cooling circuit (TC)

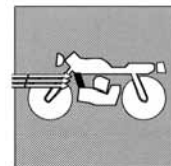


H00788

The forced circulation cooling system uses a centrifugal pump (located to the left of the head) and two down-draft radiators.

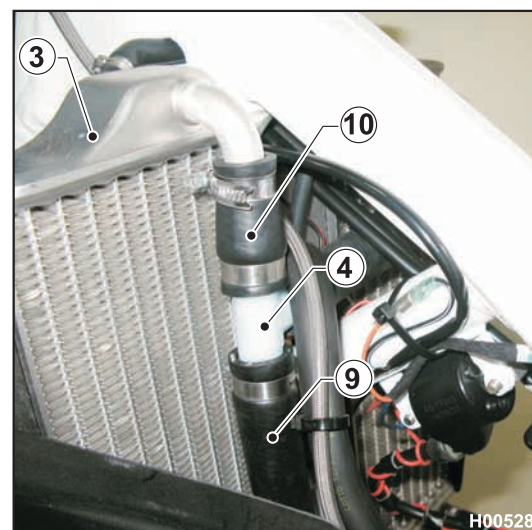
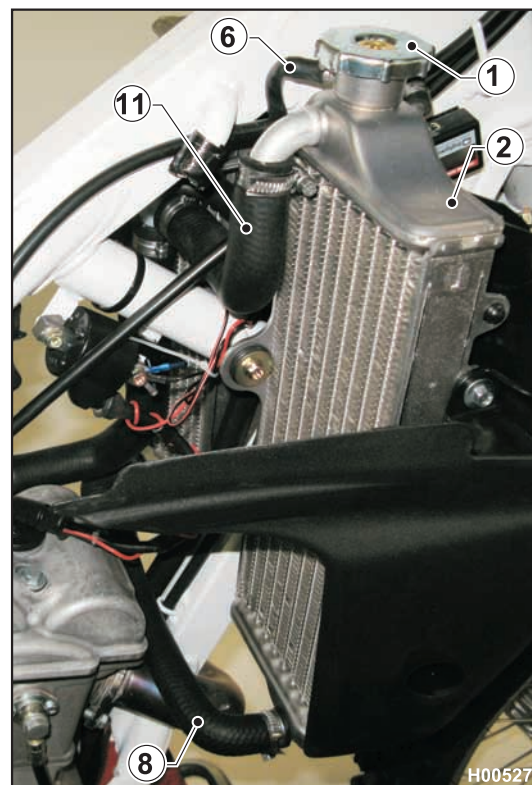
- 1 Radiator cap
- 2 Right-hand radiator
- 3 Left-hand radiator
- 4 Fitting
- 5 Water pump
- 6 Breather hose
- 7 Radiator connecting pipe
- 8 Radiators to cylinder head pipe
- 9 Water pump to fitting pipe
- 10 Fitting to left-hand radiator pipe
- 11 Fitting to right-hand radiator pipe

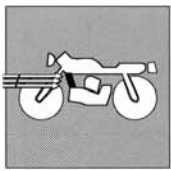




Engine cooling system overhaul (TC)

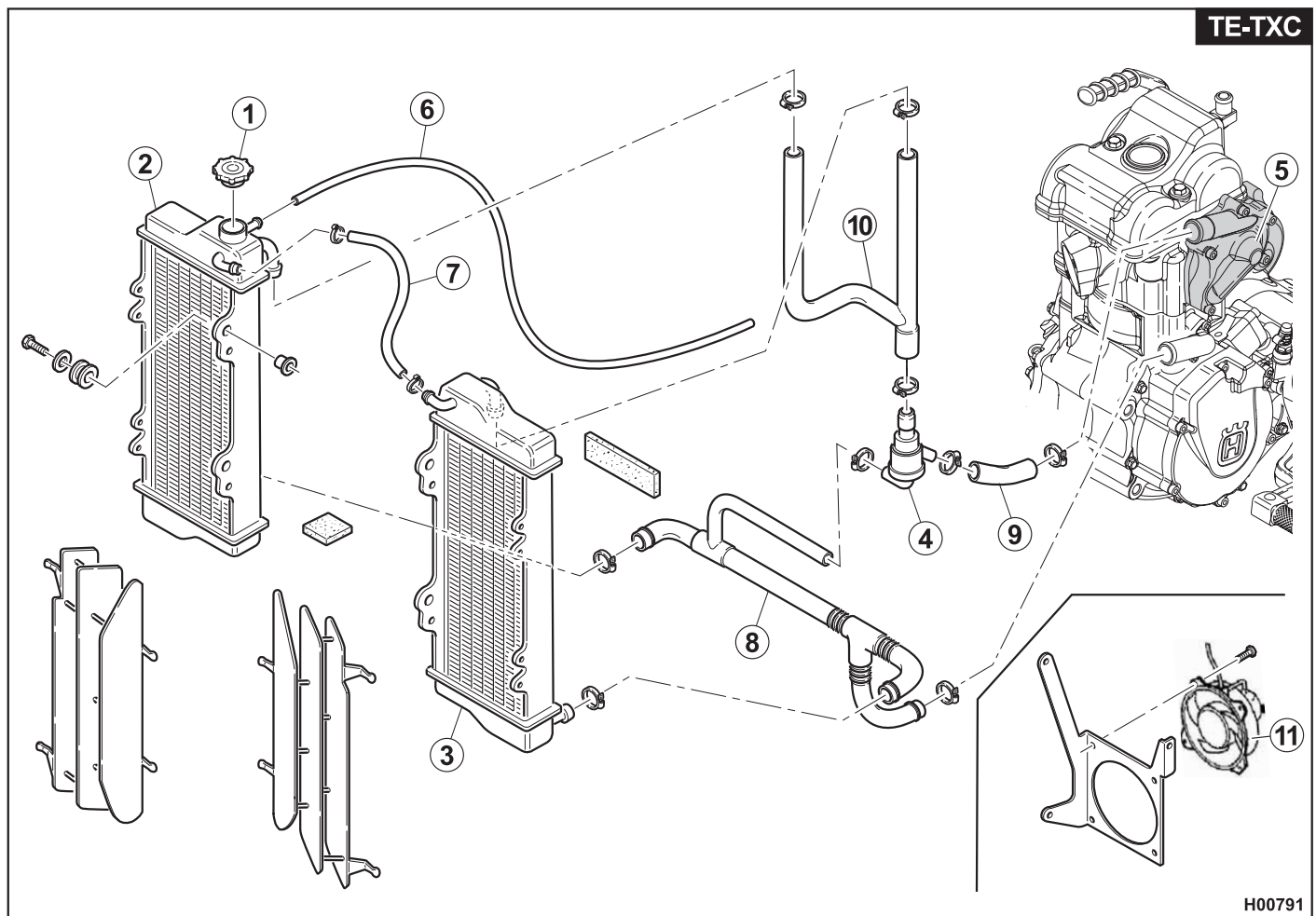
If the coolant runs too hot, check the radiators. Any foreign matter trapped between the fins (such as leaves, bugs, mud, etc.) will obstruct air flow and must be removed carefully to avoid damage to radiator. Straighten any bent fins to ensure free flow of air. If the cooling mass is clogged or damaged, no more than 20% of its surface must be affected. If damage exceeds this limit, the radiator must be replaced. Periodically check the connecting hoses (see Section B, "Scheduled Maintenance Chart"); this will avoid coolant leakage and consequent engine seizure. If hoses show cracks, swelling or hardening due to sheaths desiccation, their replacement shall be advisable. Check the correct tightening of the clamps.





ENGINE COOLING

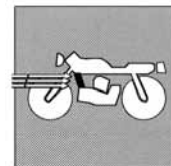
Cooling circuit (TE-TXC)



The forced circulation cooling system uses a centrifugal pump (located to the left of the head) and two down-draft radiators.

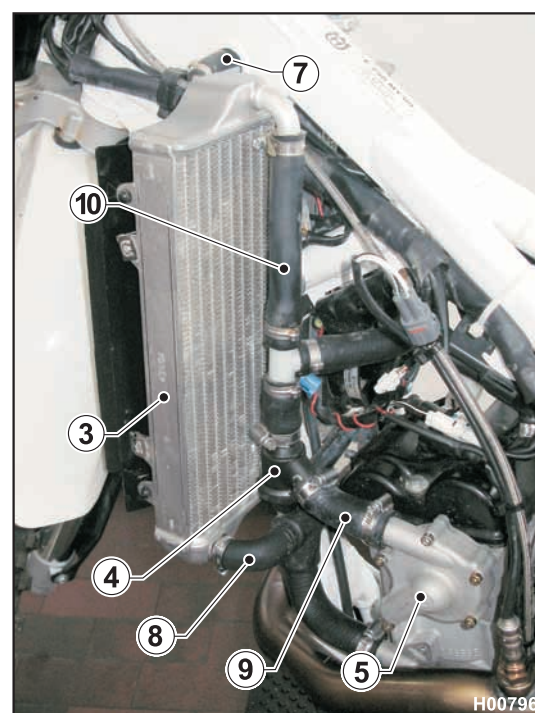
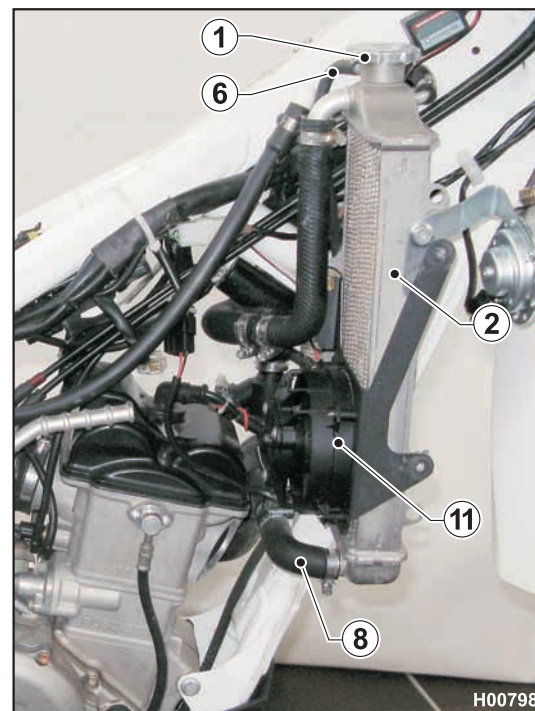
- 1 Radiator cap
- 2 Right-hand radiator
- 3 Left-hand radiator
- 4 Thermostat
- 5 Water pump
- 6 Breather hose
- 7 Radiator connecting pipe
- 8 Radiators to cylinder head pipe
- 9 Water pump to fitting pipe
- 10 Thermostat to radiators pipe
- 11 Cooling fan





Engine cooling system overhaul (TE-TXC)

If the coolant runs too hot, check the radiators. Any foreign matter trapped between the fins (such as leaves, bugs, mud, etc.) will obstruct air flow and must be removed carefully to avoid damage to radiator. Straighten any bent fins to ensure free flow of air. If the cooling mass is clogged or damaged, no more than 20% of its surface must be affected. If damage exceeds this limit, the radiator must be replaced. Periodically check the connecting hoses (see Section B, "Scheduled Maintenance Chart"); this will avoid coolant leakage and consequent engine seizure. If hoses show cracks, swelling or hardening due to sheaths desiccation, their replacement shall be advisable. Check the correct tightening of the clamps.



“KIT” INSTALLATION INSTRUCTIONS

Section

O



“KIT” INSTALLATION INSTRUCTIONS

Carburettor KIT (TC).....	D.3
Central engine guard (TE-TC-TXC).....	O.6
Start hook kit (TC, TXC)	O.7
Left muffler guard (TE)	O.9
Battery bracket and battery (TE-TXC).....	O.10
Turning indicators KIT (TE).....	O.11
REAR TURNING INDICATORS	O.12
Rear-view mirrors (TE)	O.16



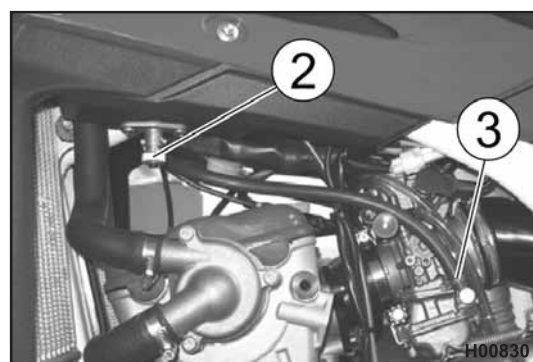
“KIT” INSTALLATION INSTRUCTIONS

Carburettor KIT (TC)

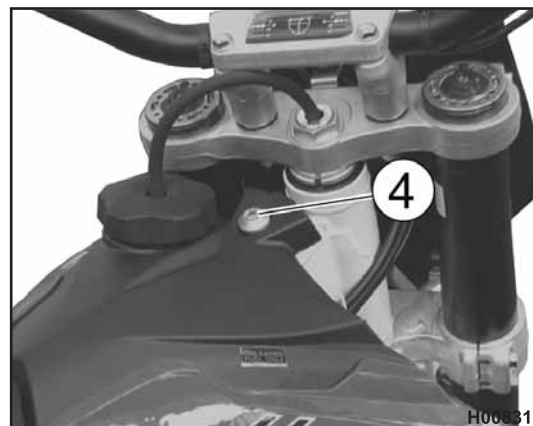
- Remove the breather hose (1) from the steering stem.



- Turn the ring nut of the fuel cock (2) counter clockwise to shut off fuel supply and loosen the clamp (3) on the hose running to the carburettor. Detach the hose at carburettor end and let fuel drain into a pan.



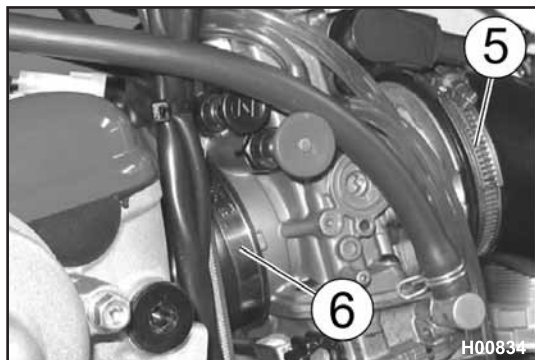
- Remove the fuel tank retaining screw (4), push the front end of the scoops slightly upwards and release them from the spoilers on the radiators.



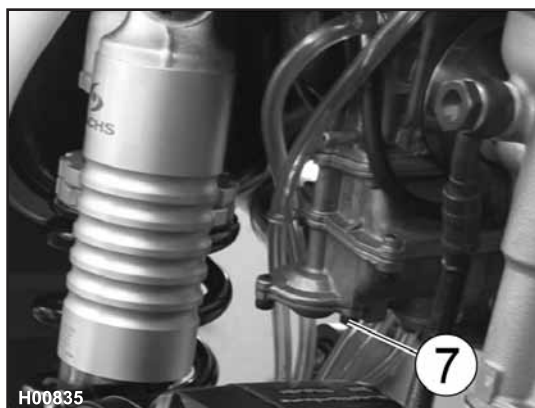
- Remove the fuel tank together with the scoops.



“KIT” INSTALLATION INSTRUCTIONS



- Slacken the clamps (5) and (6) securing the carburettor to the intake coupling and to the hose coupling on the air box .
- Pull the carburettor rearwards to release it from the intake coupling and extract it from the right-hand side of the motorcycle.



- Remove the lower retaining screw (7) of the carburettor bowl, remove the bowl and drain all fuel.



WARNING
This kit is for racing use only.



This diagram shows the exploded view of a carburetor assembly. The central component is the carburetor body. Various parts are shown around it, including:

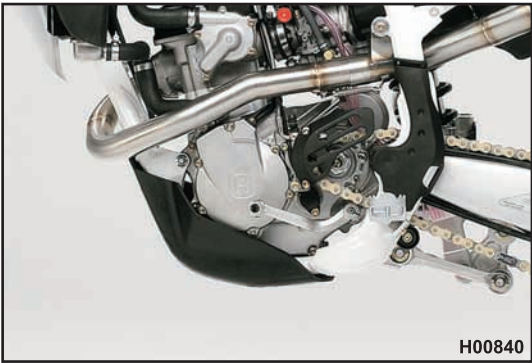
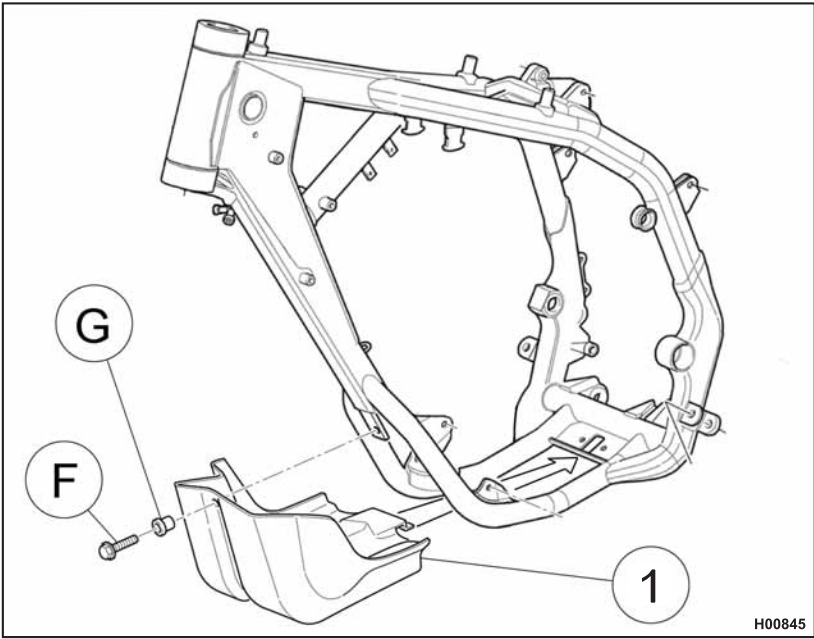
- Top components:** A fuel filter (labeled 'FUEL FILTER'), a float valve assembly, and a float bowl (labeled 'A').
- Left components:** A fuel line with a hose, a jet needle assembly, and a float bowl (labeled 'B').
- Right components:** A float valve assembly, a float bowl (labeled 'A'), and a float bowl gasket.
- Bottom components:** A float bowl (labeled '3'), a float bowl gasket, and a float bowl (labeled '1').
- Other components:** Various screws, bolts, and small parts are shown with leader lines pointing to their specific locations on the carburetor body.

TC

1- Main jet: 170, 180, 185, 195, 200.

“KIT” INSTALLATION INSTRUCTIONS

Central engine guard (TE-TC-TXC)



Part. No.	Description	Qty
1	Central engine guard	
F	M6x15 mm screw	1
G	Ø7xØ9xØ4.8 mm	1

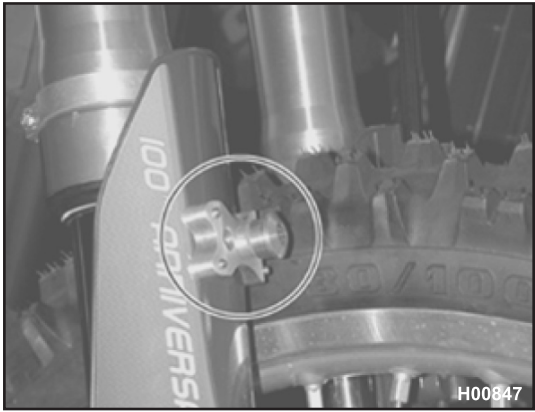
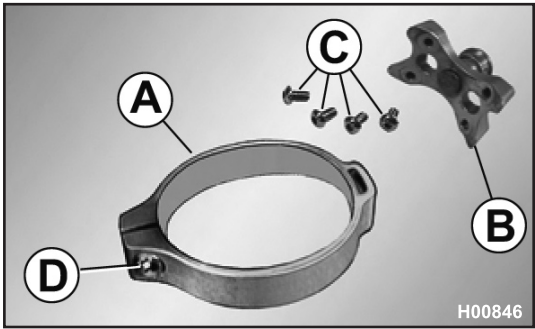
Secure guard as shown.



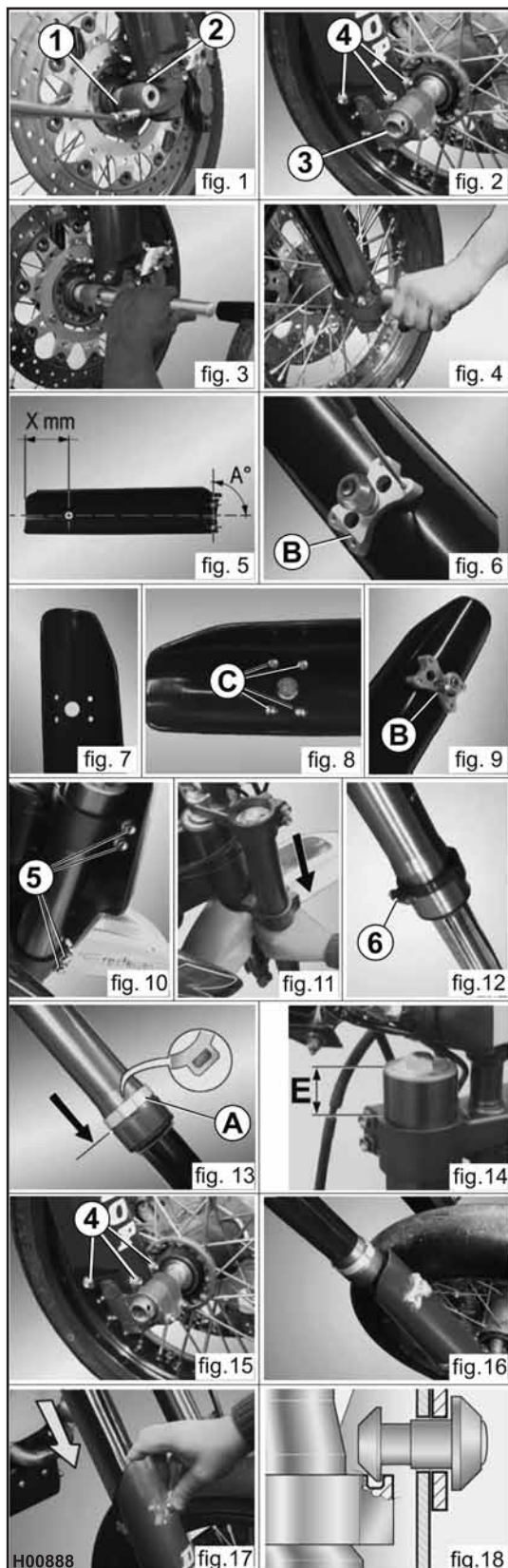
“KIT” INSTALLATION INSTRUCTIONS

Start hook kit (TC, TXC)

Part. No.	Description	Qty
A	Ring	1
B	Hook	1
C	M4x8 mm screw	4
D	M5x16 mm screw	1



"KIT" INSTALLATION INSTRUCTIONS



Preliminary operations

- Set a stand under the engine and see that the front wheel is lifted from the ground.
- Loosen the four retaining screws (1, fig. 1) of the front wheel axle.
- Loosen and remove the retaining screw (2, fig. 1) of front wheel axle (3, fig. 2) while holding the axle at the opposite end to prevent rotation; tap the axle with a nylon punch, remove axle and front wheel and lay down the wheel with brake disc on top.
- Remove the three retaining screws (4, fig. 2) of the right-hand fork guard and remove the guard.

NOTE

Do not operate the front brake lever when the wheel has been removed; this causes the calliper pistons to move outwards.

- Drill a $\varnothing 12$ mm hole in the right-hand fork guard. Drill hole on the centreline, at distance $X=80$ mm from the top edge as shown in fig. 5 ($A^\circ=90^\circ$); remove any burrs.
- Insert the hook "B" into the fork guard as shown in fig. 6. Hold the hook in place and trace the drilling pattern with a bit through the four screw mounting holes.
- Remove the hook from the fork guard and drill four holes with a $\varnothing 4.5$ mm bit keeping the bit perpendicular to fork guard surface. Insert the hook into the fork guard and secure it with the four screws "C".
- Loosen the four screws (5) that secure the right fork leg and remove it from the yokes.
- Remove the fork leg protection ring (6) loosening the retaining screw.
- Slide ring "A" onto the fork leg from the top and push it fully home (fig.13), then tighten the screw "D".
- Place the right fork leg in the yokes, set the original pull-through height "E" (refer to L.H. side) and tighten the four retaining screws.
- Refit the front wheel reversing the disassembly procedure.
- Refit the fork leg guard to the right-hand fork leg and tighten the three retaining screws (4, fig. 15).
- Lower the fork leg until the ring "A" is below "B", then push the hook pin fully down (fig.17) and slowly release the fork leg until the pin head engages the recess in the ring as shown in the diagram in fig. 18.



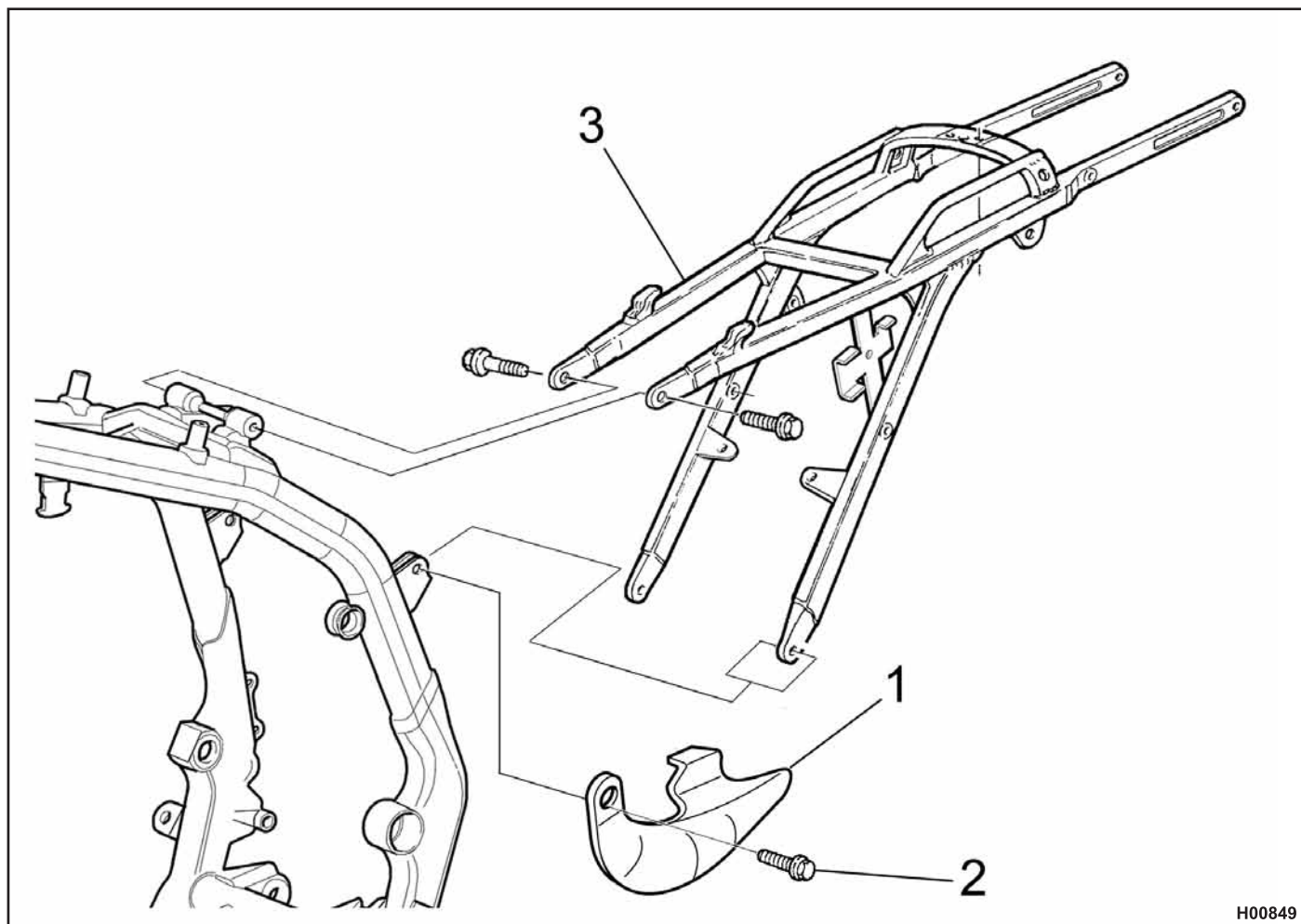
WARNING

This kit is for racing use only.



"KIT" INSTALLATION INSTRUCTIONS

Left muffler guard (TE)



- Install the guard (1) using the screw (2): (M8x20 mm) that secures the rear chassis (3) at the rear end.

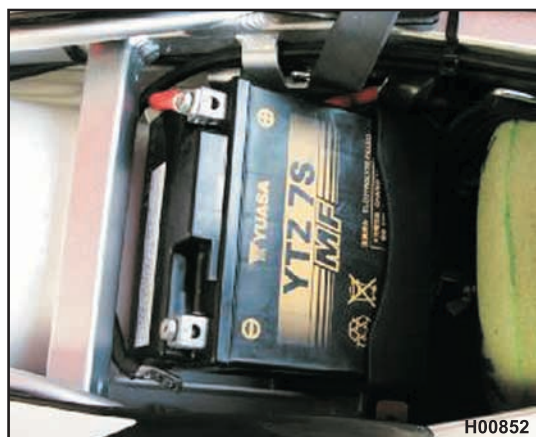


“KIT” INSTALLATION INSTRUCTIONS



Battery bracket and battery (TE-TXC)

- Remove the saddle.
- Install the bracket as shown in the figure.



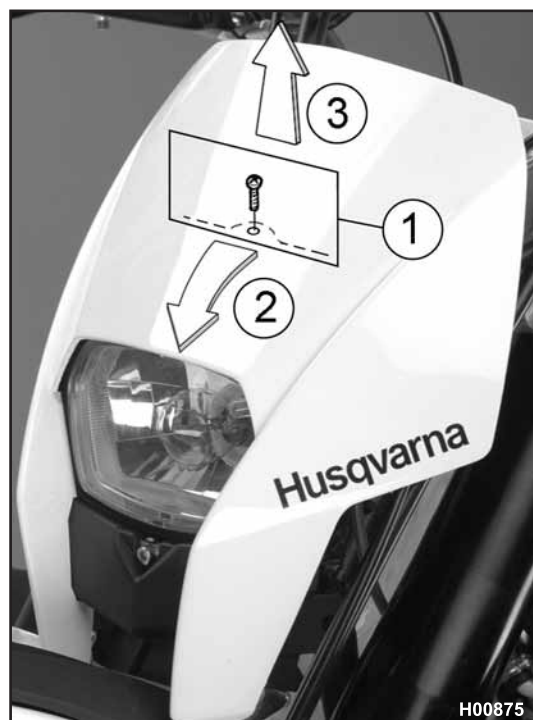
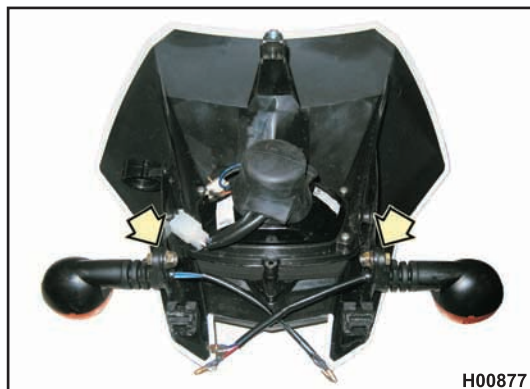
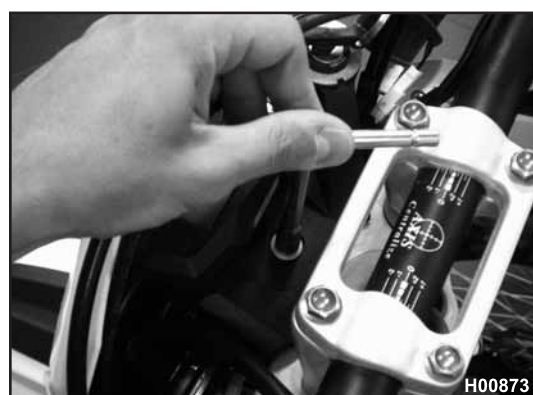
- Connect the RED positive cable first and then the BLACK negative cable. Secure the battery in place with its strap.



“KIT” INSTALLATION INSTRUCTIONS

Turning indicators KIT (TE)

- 1 - Front L.H. indicator (1 piece, cable L: 115-150 mm)
- 2 - Front R.H. indicator (1 piece, cable L: 115-150 mm)
- 3 - Rear L.H. indicator (1 piece, cable L: 315-350 mm)
- 4 - Rear R.H. indicator (1 piece, cable L: 315-350 mm)
- 5 - Front M6x16 mm screw (2 pieces)
- 6 - Rear M6x20 mm screw (2 pieces)
- 7 - M6 nut (4 pieces)
- 8 - Flasher (1 piece)
- 9- Flasher bracket (1 piece)

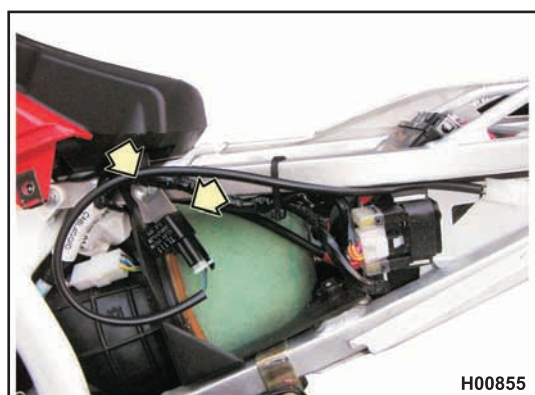


“KIT” INSTALLATION INSTRUCTIONS



REAR TURNING INDICATORS

- Remove the saddle and the L.H. side panel.



- Fit the flasher to the bracket and secure it using the side retaining screw of the air box.



"KIT" INSTALLATION INSTRUCTIONS

- Remove the tail light and disconnect its cables from the main wiring harness.



- Insert the turning indicator cables into the hole in the number plate holder.



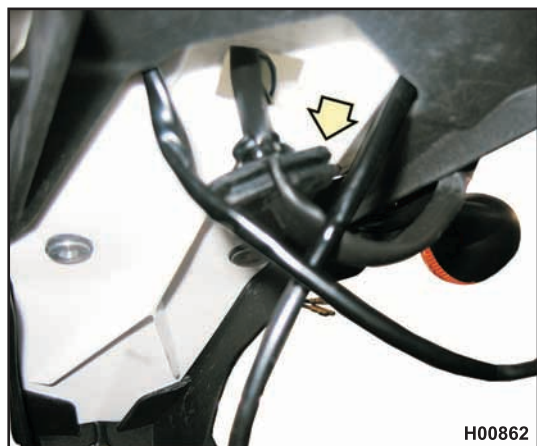
- TE: secure the indicator with the M6x20 mm screw and its nut.



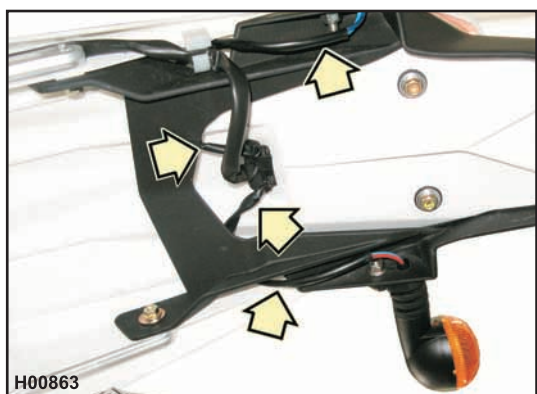
- Route the indicator cables through mudguard and number plate holder as shown in the picture.



"KIT" INSTALLATION INSTRUCTIONS



- Slide the rubber gaiter out of the mudguard, pass the indicator cables through the rubber gaiter and refit it into place.



- Connect the indicator and tail light cables to the main wiring harness (refer to the wiring diagram included in the Owner's Manual).



- Refit the tail light.
- The instructions provided for the right turning indicator also apply to the left indicator on the opposite side.

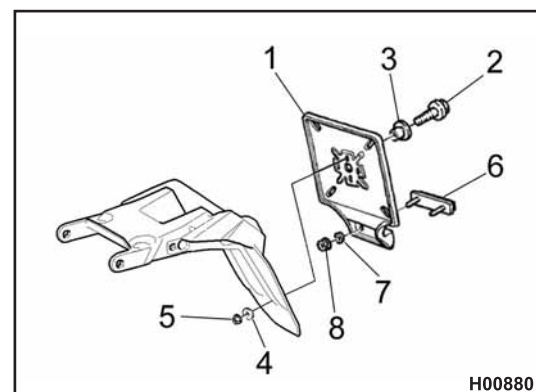


“KIT” INSTALLATION INSTRUCTIONS

Finally, secure the number plate holder to the support as shown in the figure.



- 1 - Number plate holder (1 piece)
- 2 - M5x16 mm screw (2 pieces)
- 3 - Bushing (2 pieces)
- 4 - Ø5.3xØ15x1 mm washer (2 pieces)
- 5 - M5 nut (2 pieces)
- 6 - Reflector (1 piece)
- 7 - Ø4.3xØ12x0.8 mm washer (2 pieces)
- 8 - M4 nut (2 pieces)



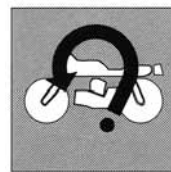
“KIT” INSTALLATION INSTRUCTIONS

Rear-view mirrors (TE)

- Fit the rear-view mirrors to the clamps of the front brake and clutch levers.



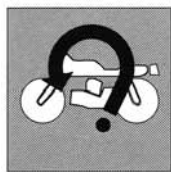
HYDRAULICALLY CONTROLLED CLUTCH



Section

P

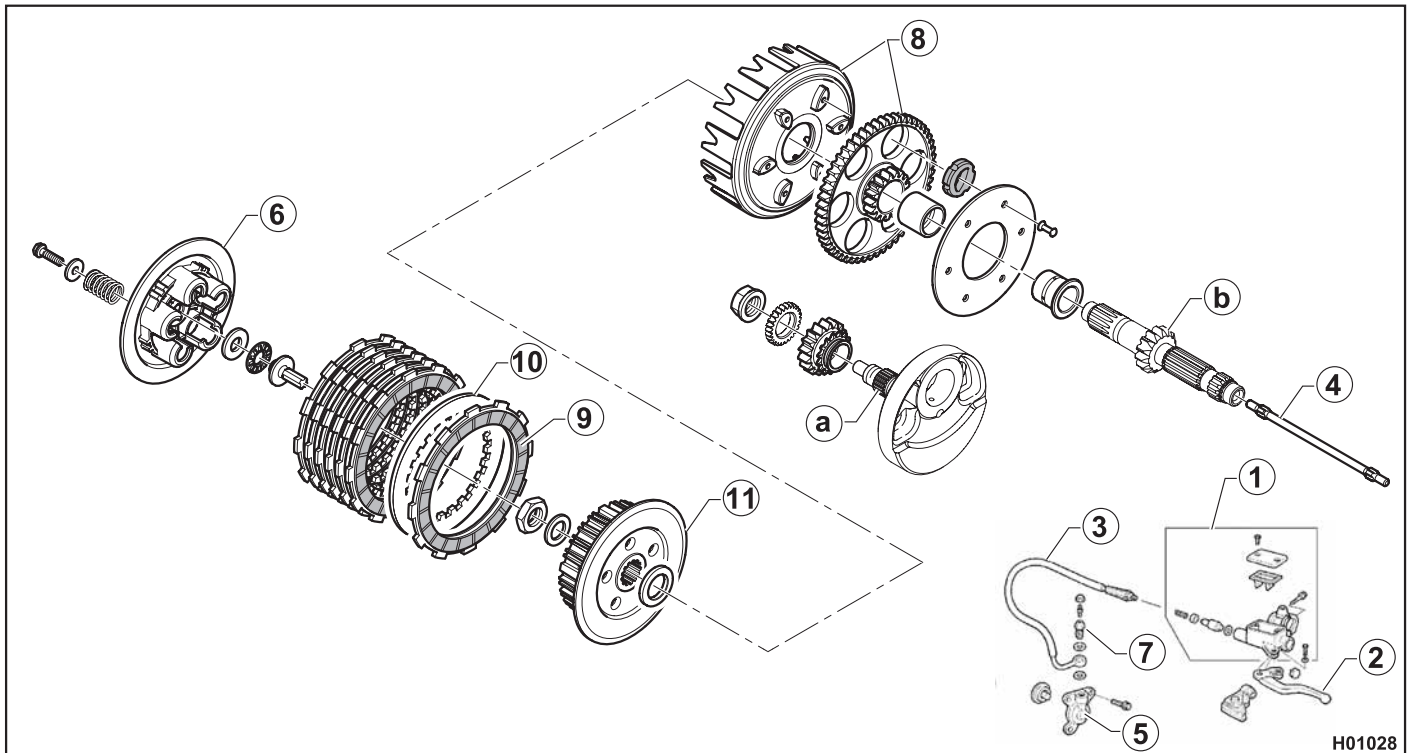
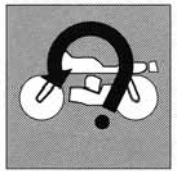




HYDRAULICALLY CONTROLLED CLUTCH

Hydraulic clutch system.....	P.3
Draining clutch fluid	P.4
Clutch master cylinder servicing.....	P.5
Bleeding the clutch system.....	P.6





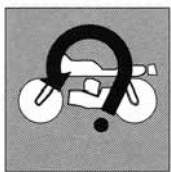
Hydraulic clutch system

The hydraulic circuit is composed of a master cylinder with its reservoir located on the left side of the handlebar, and a piston installed on the left crankcase half. The clutch is disengaged by the piston (5) that actuates the pushrod (4) to operate the pressure plate (6). Drive is transmitted from the crankshaft (a) to the gearbox input shaft (b) via the gear on the clutch housing (8). The clutch housing accommodates friction plates (9) and steel plates (10) that operate the clutch hub (11) secured to the gearbox input shaft.

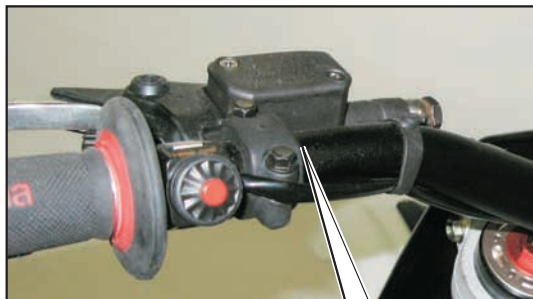
- 1 Clutch master cylinder
- 2 Clutch lever
- 3 Master cylinder to piston hose
- 4 Pushrod
- 5 Piston assembly
- 6 Pressure plate
- 7 Bleed fitting
- 8 Clutch housing with clutch ring gear
- 9 Steel plate
- 10 Friction plate
- 11 Clutch hub
- a Crankshaft
- b Gearbox input shaft



The fluid used in the hydraulic circuit will damage painted parts if spilt on them. Handle it with care when servicing the system.

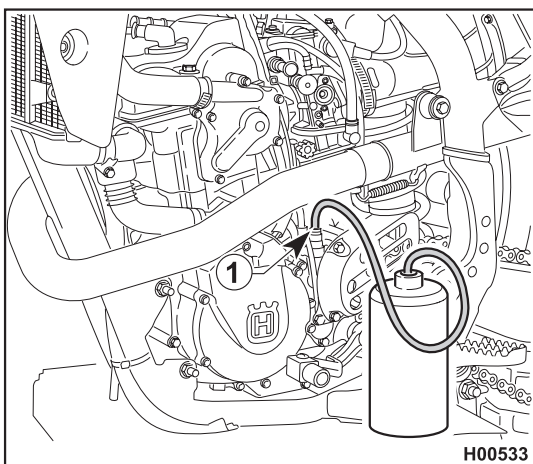
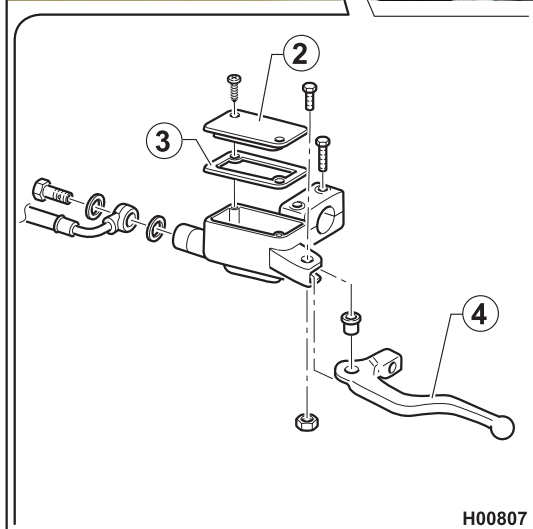


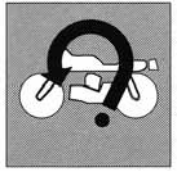
HYDRAULICALLY CONTROLLED CLUTCH



Draining clutch fluid

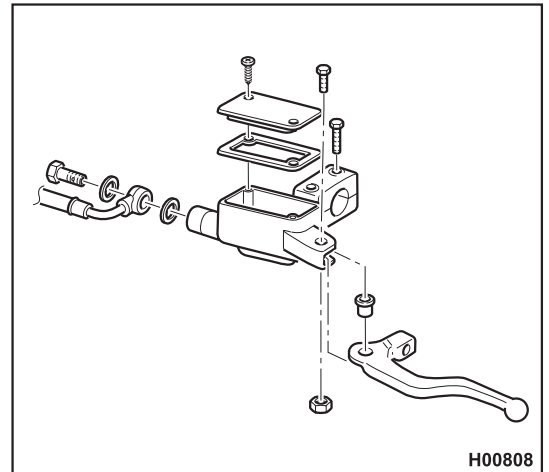
Connect a plastic hose to the bleed valve (1) and the loosen the valve turning it back 1 or 2 turns. Remove reservoir cap (2) and gasket (3) and operate the control lever (4) until draining all fluid.

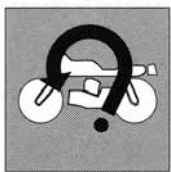




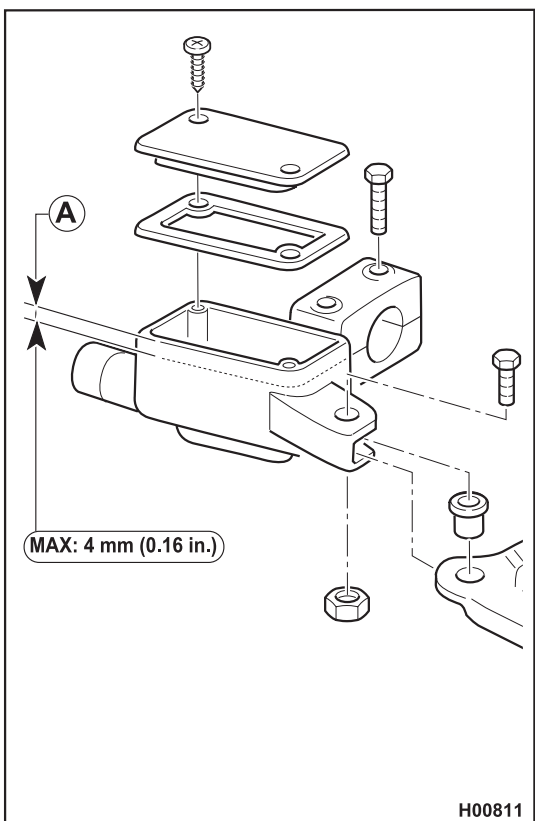
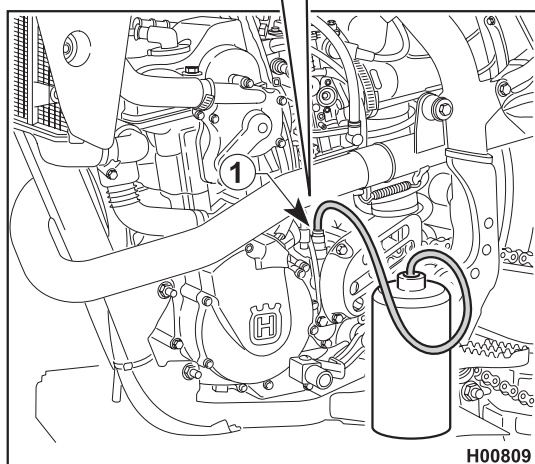
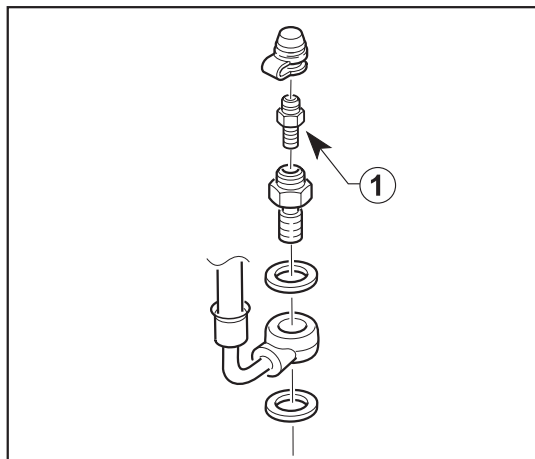
Clutch master cylinder servicing

Drain the circuit, detach the master cylinder from the left side of the handlebar and take it apart. Replace all seals, reassemble the master cylinder and refit it to the handlebar. Reconnect the hose and fill fresh fluid into the reservoir; bleed the system as described in the relevant paragraph.





HYDRAULICALLY CONTROLLED CLUTCH



Bleeding the clutch system

A long travel and mushy feel of the clutch lever indicate that there is air in the system and the clutch hydraulic system needs bleeding.

Bleeding procedure is as follows:

- Take the rubber cap off the bleed valve (1).
- Attach a clear plastic hose to the bleed valve and place the other end of the hose in a vessel (make sure the hose end stays dipped in the fluid throughout the procedure).
- Remove the reservoir cover (2) and the rubber diaphragm (3) and fill fresh fluid into the reservoir. Use the fluid specified in the lubricant table (see Section A).
- Slacken the bleed valve and operate the lever (4) repeatedly until the fluid flowing out of the hose looks clear and free of air bubbles: now tighten the bleed valve.
- Top up fluid level (A) and refit rubber diaphragm (3) and reservoir cover (2).



Fluid level inside the reservoir shall never drop below the minimum notch during the bleeding procedure.



Hydraulic fluid is corrosive. In the event of contact with eyes, rinse with abundant water.



Motorcycle handlebar must be turned to the right during the bleeding procedure. This will keep the master cylinder reservoir higher, making bleeding easier.



The bleeding procedure does not remove all air from the circuit; any small amounts of air left in the circuit will disappear after a short period of usage; this will eliminate the mushy feel of the lever and restore its travel to proper length.



Bleed valve tightening torque: 12-16 Nm, 1.2-1.6 Kgm, 8.7-11.6 ft/lb.



OPTIONAL COMPONENTS



Section

Q





OPTIONAL COMPONENTS

OPTIONAL COMPONENTS (TC)

Pos.	Part No.	Description
1	8F0096837	CHAIN SPROCKET Z=52 (1)
	8D0096837	CHAIN SPROCKET Z=50 (1)
	8C0096837	CHAIN SPROCKET Z=49 (1)
2	8000A7126	TRANSMISSION SPROCKET Z=12 (1)

OPTIONAL COMPONENTS (TE)

Pos.	Part No.	Description
1*	8F0096837	CHAIN SPROCKET Z=52 (1)
	8C0096837	CHAIN SPROCKET Z=49 (1)
	8D0096837	CHAIN SPROCKET Z=50 (1)
	8000A7126	TRANSMISSION SPROCKET Z=12 (1)

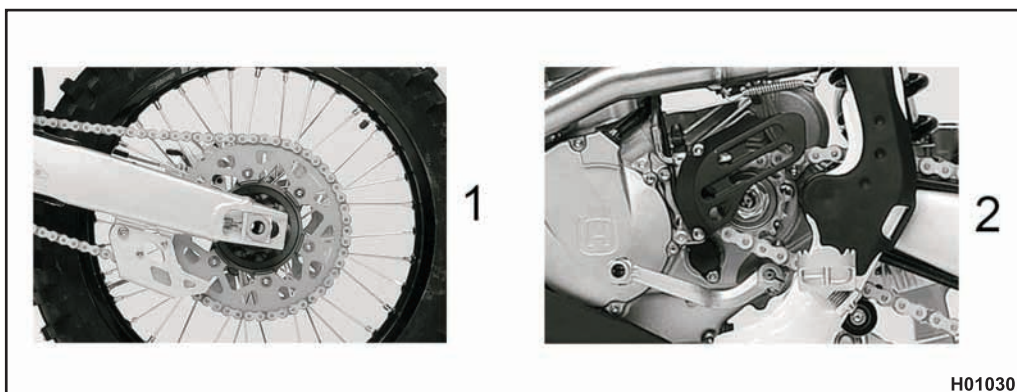


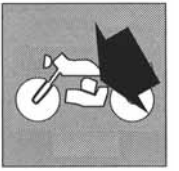
OPTIONAL COMPONENTS



OPTIONAL COMPONENTS (TXC)

Pos.	Part No.	Description
1	8F0096837	CHAIN SPROCKET Z=52 (1)
	8C0096837)	CHAIN SPROCKET Z=49 (1)
	8D0096837	CHAIN SPROCKET Z=50 (1)
2	8000A7126)	TRANSMISSION SPROCKET Z=12 (1)

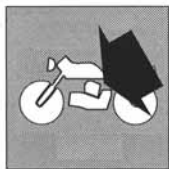




Section

S

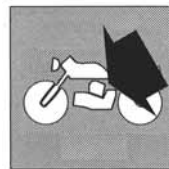




FUEL INJECTION SYSTEM

INJECTION FUEL FEEDING SYSTEM (TE-TXC)	S.3
Operation Manual for "DIAGNOSTIC TOOL SOFTWARE KIT" for injection fuel feeding system (TE-TXC).....	S.4
Fuel pump inspection (TE - TXC)	S.6
Relay inspection (TE - TXC).....	S.7





INJECTION FUEL FEEDING SYSTEM (TE-TXC)

The injection fuel feeding system is composed of fuel tank (1), electric pump (2), pipe (3) and injector (4). The fuel in the tank is pumped by the pump. The pressurised fuel flows into the injector installed on the throttle body (6). The electronic control unit (5) located under the tank signals the injector to open and a fan-shaped spray of fuel is injected into the combustion chamber.

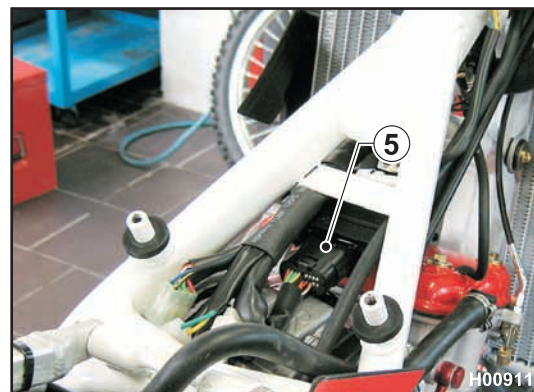
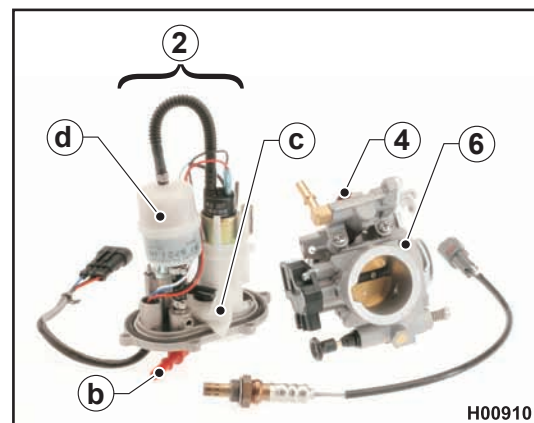
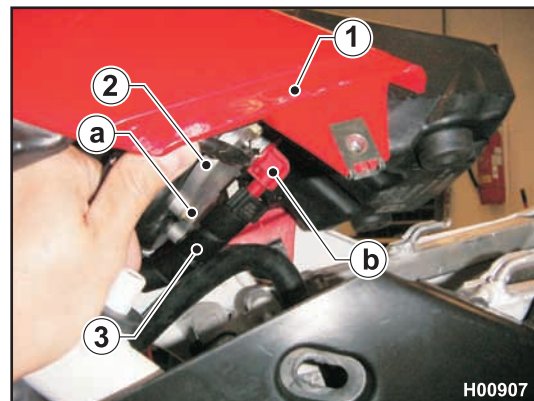
The parameters that play a role in determining proper fuel delivery under all operating conditions are as follows:

- Air temperature in the intake manifold;
- Engine coolant temperature;
- Atmospheric pressure in the intake manifold (in current location and at current altitude);
- Throttle opening;
- Lean or rich mixture (LAMBDA sensor);
- Battery voltage;
- Sensor power supply unit;
- Gear shift position;
- Fuel injection pulse width;
- Ignition coil;
- Lambda sensor heater.

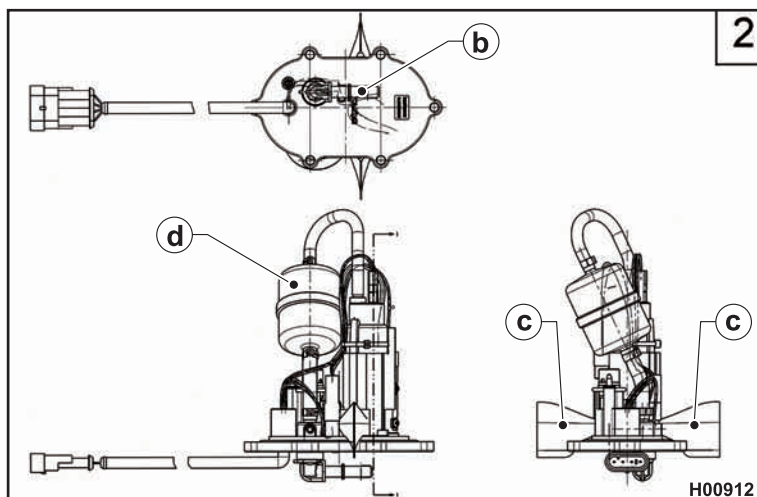
The "DIAGNOSTIC TOOL SOFTWARE KIT (see pages S.3-S.4) provides a tool to check these parameters in the event the fuel injection malfunctions.

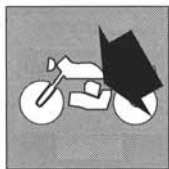
The electric fuel pump (2) is installed on the bottom of the tank (1) and is composed of rotor, magnet, impeller, brushes, control valve and relief valve. The electronic control unit (5) switches the pump ON/OFF.

To remove the fuel pump, you first need to remove the fuel tank as described in Section "E" and then the six retaining screws (a); to refit the pump, simply reverse the removal procedure (fuel pump inspection is covered in a separate paragraph).

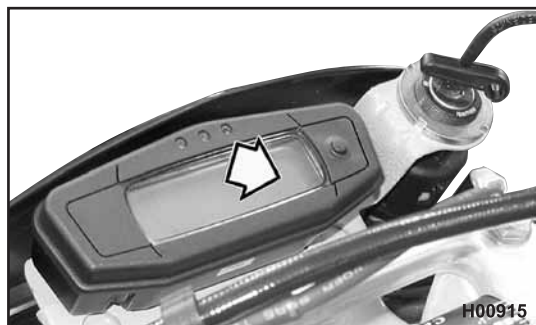


- a- Fuel pump retaining screw
- b- Delivery fitting
- c- Pump filter
- d- Fuel filter





FUEL INJECTION SYSTEM



Operation Manual for "DIAGNOSTIC TOOL SOFTWARE KIT" for injection fuel feeding system

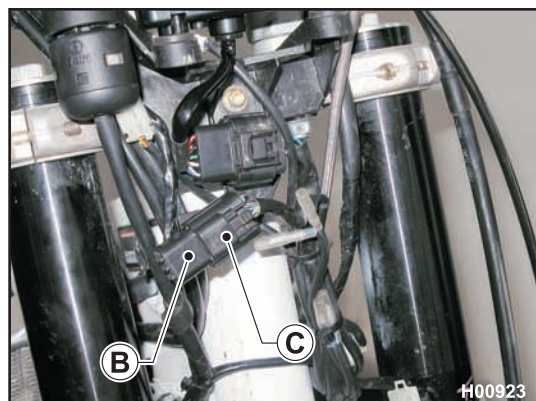
The injection fuel feeding system does not require scheduled maintenance. The DIAGNOSTIC TOOL SOFTWARE KIT part no. 8B00 A9634 lets you test system components in the event of a malfunction. A malfunction is indicated by the word "FAIL" appearing in the right-hand portion of the dashboard display when the ignition key is set to ON and the right switch is set to RUN.

The DIAGNOSTIC TOOL SOFTWARE KIT (A) is composed of:

- "Diagnostic Tool" Software CD-ROM, including User Guide (PDF), Operation Manual (PDF);
- User Guide hard-copy;
- Operation Manual hard-copy;
- PC cable for connection to electronic control unit (ECU) connector.

After installing the Diagnostic Tool Software according to the instructions provided in the User Guide, proceed as follows:

- remove the headlamp fairing as described in Section "M";
- slip off the cap (B) of the ECU interface connector (C);
- connect the Kit cable (D) to the connector (C) and the serial port (E) of your PC;
- turn the ignition key (F) to ON and set the right switch (G) to RUN;
- start the "Diagnostic Tool" software you have installed and perform the required tests.

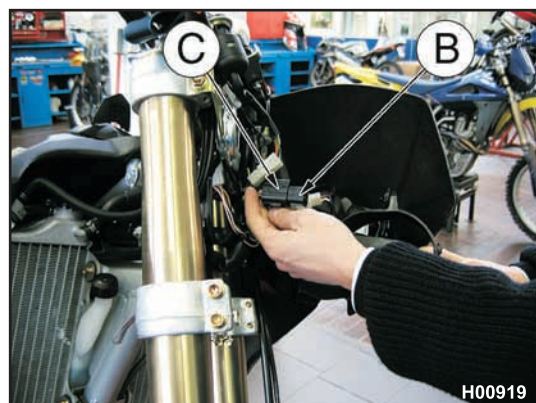


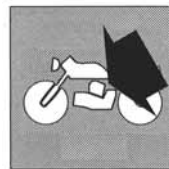
If the throttle body (H) has been removed and/or replaced, the TPS will need to be re-initialised using options "TPS idle setting" (see Operation Manual) and "Feedback Correction" (Operation Manual). For "Feedback Correction Value", see fig. 9-3-4 on page S.5.



This diagnostic software can check the following injection parameters:

- 1 - AIR TEMPERATURE (air temperature in the intake manifold);
- 2 - WATER TEMPERATURE (engine coolant temperature);
- 3 - AIR PRESSURE (atmospheric pressure in current location and at current altitude);
- 4 - THROTTLE POSITION (throttle opening rate);
- 5 - TILT SENSOR (detects rollover);
- 6 - O2 SENSOR (detects lean or rich mixture);
- 7 - BATTERY SENSOR (battery voltage);
- 8 - SENSOR POWER SUPPLY (power supply unit feeding the sensors);
- 9 - GEAR SHIFT POSITION (currently selected gear shift position);
- 10 - INJECTOR (fuel injection pulse width);
- 11 - IGNITION COIL (device that stores energy in the reel and discharges it to the spark plug);
- 12 - O2 SENSOR HEATER (heats O2 sensor up to a temperature that will provide a stable output).





In addition to identifying any current malfunction, the software stores past malfunctions that have been resolved: store malfunctions can be deleted following the instructions provided in the Operation Manual.



The ECU stores the number of service hours of the engine (tolerance range: ± 1 hour). The first equipment ECU also stores the vehicle identification number (VIN) and engine number (engine no.) of the motorcycle. If ECU is replaced, the new ECU will only report engine service hours.

NOTES

The green neutral light ONLY turns on when the ignition key is set to ON and the right switch to RUN.

When the ignition key is turned to the ON position, the front and rear lights and the display light up.

Left switch functions and the stop light can ONLY be selected when the engine is running.

For fuel pump and relay inspections, see relevant paragraphs.

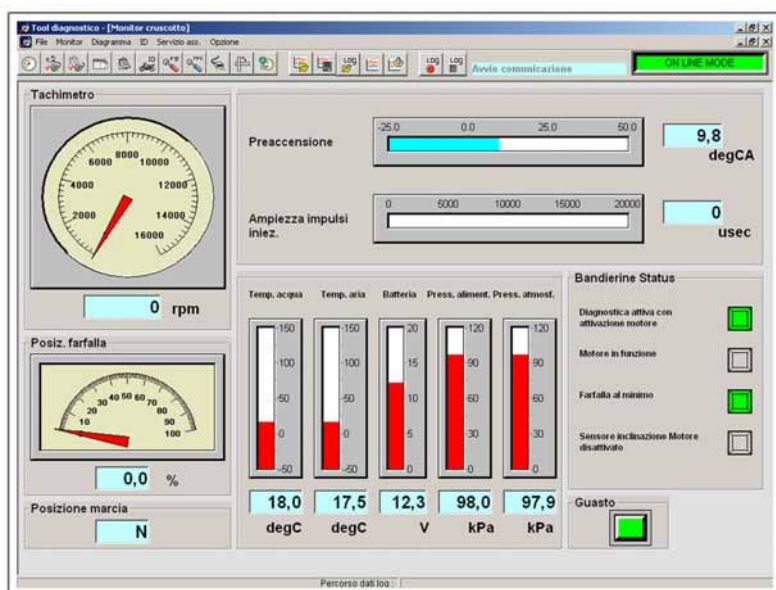
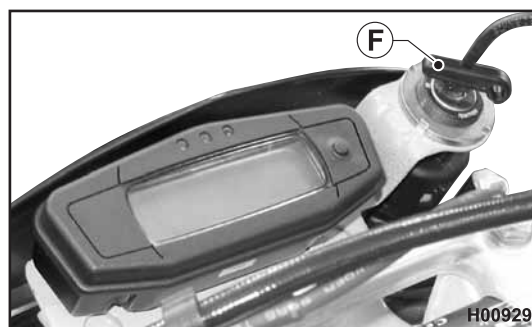
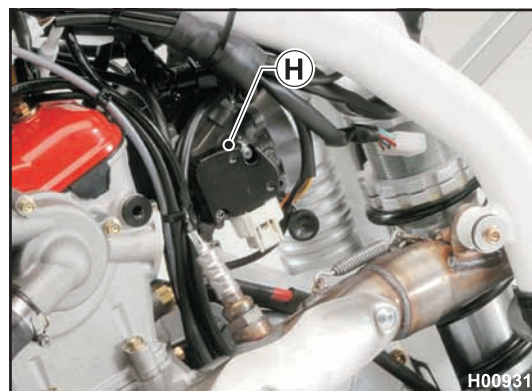
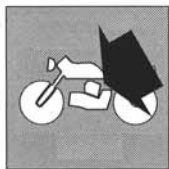


Fig. 9-3-4

Adjust item No. 1 so that the "Feedback correction value" is $\sim 100.0\%$

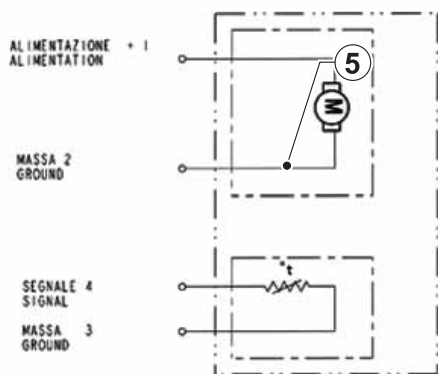
Adjusting points No. 2 and 3: THEY MUST NOT MODIFIED (100%)





FUEL INJECTION SYSTEM

SCHEMA ELETTRICO



H00932

Fuel pump test (TE - TXC)

Remove the pump as described on page S.2.

A: fuel reserve sensor

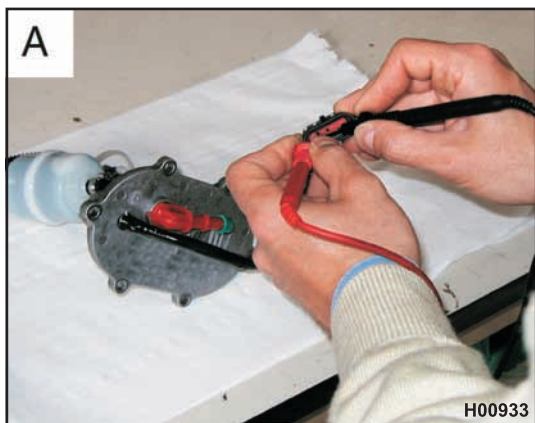
Make sure there is no fuel left in the sensor and then set the meter to the "Impedance" scale and measure across the BLUE and WHITE wires. Correct value is as follows: 1.3 KOhm (+/- 10%) at 20 °C.

B: pump operation

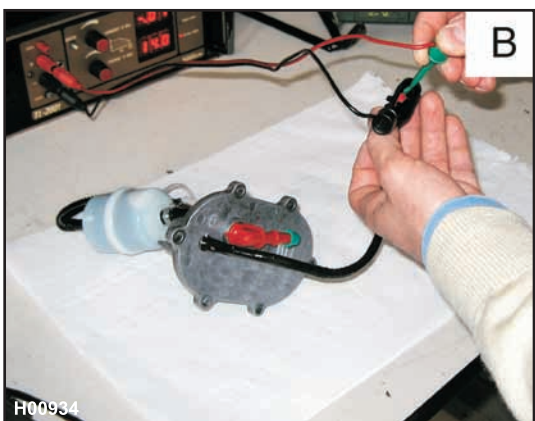
Connect the RED (+) and BLACK (-) wires to a power supply unit with constant 12V output and make sure that the pump runs.



Never keep the pump connected to the power supply unit for more than 3 seconds in a row.

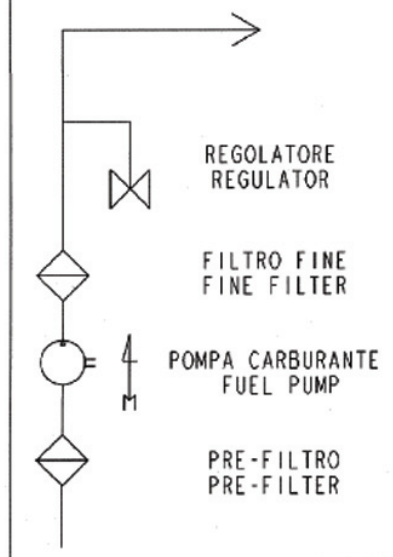


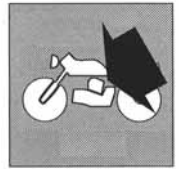
H00933



H00934

SCHEMA IDRAULICO





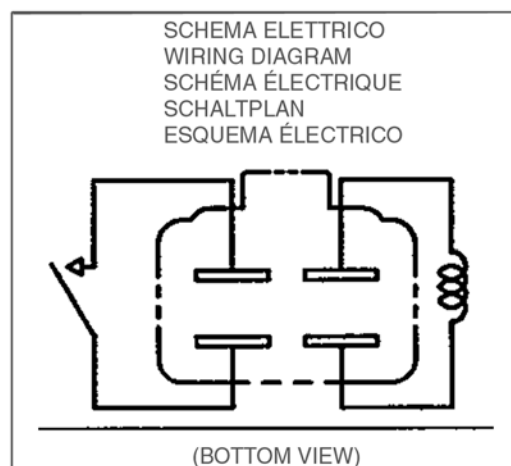
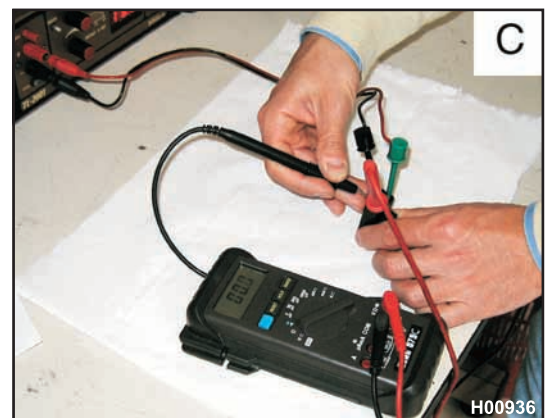
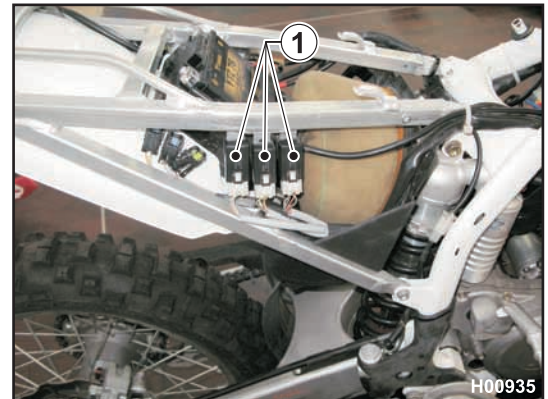
Relay test (TE - TXC)

Remove saddle and fuel tank as described in "Section E". Remove the relays (1) located on the R.H. side of the chassis.

A: Set the meter to the "Impedance" scale and check the energiser coil for proper operation. Reading should be: 80 Ohm (+/- 10%) at 20 °C.

B: Set the meter to "Continuity" mode and check the circuit is open.

C: Feed the coil from a power supply unit with stable 12V output and make sure that the circuit closes.



SPECIAL TOOLS



Section **W**



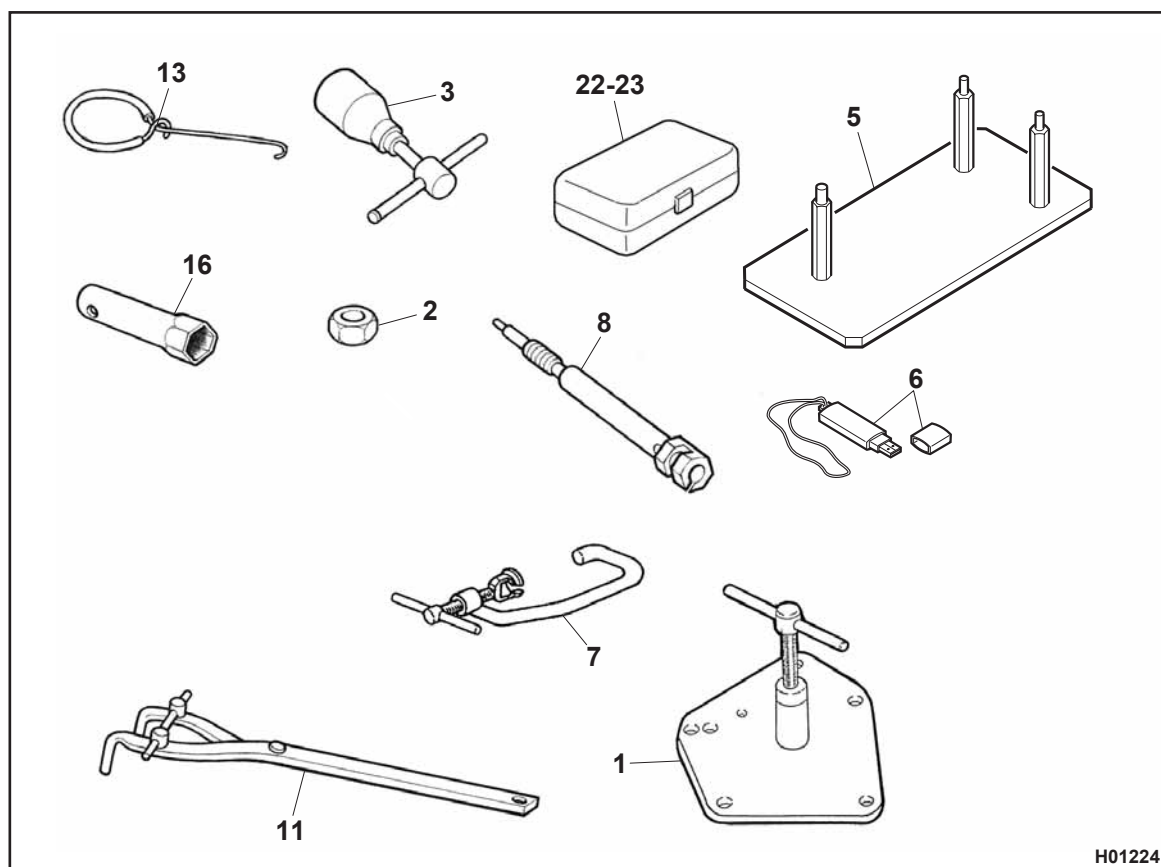


SPECIAL TOOLS

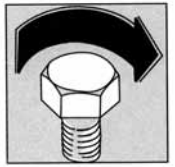
SPECIAL TOOLS

- 1 (8000 A7015) Crankcase puller
- 2 (8000 A1580) T.D.C. timing tool
- 3 (8000 A1559) Flywheel puller (TC)
(8000 H2146) Flywheel puller (TE-TXC)
- 5 (8000 A7345) Jig (TC)
(8000 A7345) Jig (TE-TXC)
- 6 (8000 H1807) USB pen drive
- 7 (8000 A7317) Valve installation / removal tool
- 8 (8000 A1625) Dial gauge mount
- 11 (8000 79015) Clutch hub tool
- 13 (1519 84701) Spring hook
- 16 (8000 95749) Spark plug tool
- 22 (8B00 A9634) Diagnostic Tool Software Kit
- 23 (8B00 H0237) "Reflash Tool" Kit

* for additional ECU mappings with motorcycle in the "RACING CONFIGURATION"; see Section O (Vehicle not meeting type-approval specifications).



TIGHTENING TORQUE FIGURES

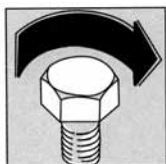


Section



Tighten all nuts and screws to the specified torque using a torque wrench. If not tightened securely, a nut or a screw might become damaged or work itself loose, causing damage to motorcycle and injury to rider. An overtightened nut or screw might become damaged, its thread might strip, or the nut/screw might fail and work itself loose. Listed in the table are the tightening torque figures for the most important nuts and screws, which have determined in accordance with thread diameter, pitch and specific application. These figures are obtained after cleaning the threads with solvent.





TIGHTENING TORQUE FIGURES

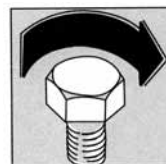
TIGHTENING TORQUE FIGURES (+/- 5%) ENGINE (8000 A7028)

Cylinder head			
Screw TFEI M6x1-L30	Cap	10 Nm	1.02 Kgm
Screw TFEI M6x1-L35	Cap	10 Nm	1.02 Kgm
Screw TFEI M5-L30	Cap	5.5 Nm	0.56 Kgm
Screw TFEI M5-L25	Cap	5.5 Nm	0.56 Kgm
Screw TTEI M5x0.8 L.8	Blow-by labyrinth plate (+LOCTITE 243)	6 Nm	0.6 Kgm
Special flanged screw L.23.4	Head cover and fuel	8 Nm	0.8 Kgm
Special flanged screw L.31.3	Head cover	8 Nm	0.8 Kgm
Water temperature sensor M10x1.25		5 Nm	0.5 Kgm
Hole plug (water sensor) M10x1.25		8 Nm	0.8 Kgm
Head stud bolt		40 Nm	4.1 Kgm
Head stud bolt		40 Nm	4.1 Kgm
Drive and transmission			
Flanged nut M16	Drive gear	100 Nm	10.2 Kgm
Timing system			
Cheese-headed Phillips screw M4-L10	Flanged shaft	3 Nm	0.3 Kgm
Screw TEF M6-L8-D14	Chain tensioner closure	8 Nm	0.8 Kgm
Screw TEF M6-L20	Chain tensioner	8 Nm	0.8 Kgm
Special M6x1 screw	Slider (use LOCTITE 243)	8 Nm	0.8 Kgm
Crankcase			
Screw TSEI M5-L12	Crankshaft bearing plate (+LOCTITE 270 or LOCTITE 272)	6 Nm	0.6 Kgm
Screw TEF M5x0.8-CH8-L8	For oil seal retaining plate	6 Nm	0.6 Kgm
Screw TSEI M6-L10	Desmo bearing plate (use LOCTITE 270 - or LOCTITE 243)	8 Nm	0.8 Kgm
Selector spring pin M8x1.25	Use LOCTITE 270 - or LOCTITE 272	25 Nm	2.55 Kgm
Screw TSEI M6-L14	Starter plate (use LOCTITE 270 - or LOCTITE 272)	8 Nm	0.8 Kgm
Screw TEF M6x1-L55	Crankcase joining	8 Nm	0.8 Kgm
Screw TEF M6x1-L60	Crankcase joining	8 Nm	0.8 Kgm
Screw TEF M6x1-L70	Crankcase joining	8 Nm	0.8 Kgm
Screw TEF M6x1-L90	Crankcase joining	8 Nm	0.8 Kgm
Screw TEF M6x1-L20	R.H. cover	8 Nm	0.8 Kgm
Screw TEF M6x1-L50	R.H. cover and clutch cover	8 Nm	0.8 Kgm
Screw TEF M6-L22	Clutch cover	8 Nm	0.8 Kgm
Screw TEF M5-L16	Oil filter cover	6 Nm	0.6 Kgm
Screw TCEI M5 L35	Ignition cover	6 Nm	0.6 Kgm
Screw TCEI M5 L40	Ignition cover	6 Nm	0.6 Kgm
Lubrication			

1 Nm = 0.73756 ft/lb



TIGHTENING TORQUE FIGURES

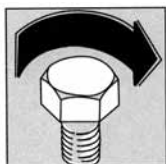


Screw TCEI M5x0.8 L20	Oil pump body	6 Nm	0.6 Kgm
Oil drain plug M14x1.5		25 Nm	2.55 Kgm
Drilled screw TEF M8x1.25 (aluminium)	Pipe	8 Nm	0.8 Kgm
Oil filler plug		Finger-tight	
Electrical System			
Screw TEF M6x1-CH8-L20	Coil to chassis	8 Nm	0.8 Kgm
Screw TCEI M5-L12	Stator (use LOCTITE 272)	6 Nm	0.6 Kgm
Screw TCEI M5-L20	Pick-up sensor (use LOCTITE 272)	6 Nm	0.6 Kgm
Flanged nut M12x1	Flywheel	75 Nm	7.65 Kgm
Screw TEF M6x1-CH8-L20	Regulator to chassis	8 Nm	0.8 Kgm
Spark plug	M10x1		(*)
Clutch			
Nut M16x1-CH27-SP7	Clutch hub	65 Nm	6.6 Kgm
Screw TEF M6x1-CH8-L20	Pressure plate	8 Nm	0.8 Kgm
Screw TCEI M6-L16	Clutch cylinder	8 Nm	0.8 Kgm
Screw TCEI M6-L12	Clutch cylinder	8 Nm	0.8 Kgm
Starting system			
Screw TCEI M5-L30	Starter motor	6 Nm	0.6 Kgm
Short nut M6x1	Gear to starter motor shaft (+LOCTITE 243)	3.9 Nm	0.5 Kgm
Screw TCEI M5-L20	Bevel drive body	6 Nm	0.6 Kgm
Screw TEF M8-L.15	Kick start lever (+LOCTITE 272)	25 Nm	2.55 Kgm
Gearbox			
Nut M16x1	Sprocket	90 Nm	9.2 Kgm
Gear shift control			
Selector drum rtng screw M8x1.25	Use LOCTITE 270 (or LOCTITE 243)	25 Nm	2.55 Kgm
Screw TSEI M6-L14	Selector rtng plate (+LOCTITE 243)	8 Nm	0.8 Kgm
Screw TEF M6-L14	Selector rtng plate (+LOCTITE 243)	8 Nm	0.8 Kgm
Screw TEF M5x0.8-CH8-L12	Indicator	6 Nm	0.6 Kgm
Screw TEF M6x1-CH8-L20	Gear shift lever	8 Nm	0.8 Kgm
Cooling			
Serrated flanged nut M5	Impeller (use LOCTITE 270 or LOCTITE 272)	6 Nm	0.6 Kgm
Screw TCEI M5 L25	Cover	6 Nm	0.6 Kgm
Screw TCEI M5 L30	Cover	1 Nm	0.6 Kgm
Cheese-headed Phillips screw M4-L12	Fitting (+LOCTITE 243)	3 Nm	0.3 Kgm

1 Nm = 0.73756 ft/lb

(*): Smear some graphite grease on spark plug thread, do it fully home finger tight then tighten it to 10÷12 Nm torque. Loosen the spark plug then tighten it again to 10÷12 Nm.





TIGHTENING TORQUE FIGURES

TIGHTENING TORQUE FIGURES (+/- 5%) CHASSIS (99669)

N° DISEGNO DRAWING N°	DESCRIZIONE DESCRIPTION	DIMENSIONI DIMENSIONS	CLASSE DI RESISTEN. PROPERTY CLASS	COPPIA DI SERRAGGIO TORQUE WRENCH SETTINGS		NOTE NOTES
			N / mmq	N m ±5%	Kg m ±5%	
8000 62796	VITE FISSAGGIO RULLO CATENA SCREW, CHAIN ROLLER ATTACHMENT	M8 x 1.25	800 min	26.95	2.75	
8000 62725	VITE FISSAGGIO RULLO CATENA SCREW, CHAIN ROLLER ATTACHMENT	M6 x 1	800 min	10.4	1.05	-SOLO MOD. VRE, SM -VRE, SM MODELS ONLY
8000 69056	VITE FISS. INFER. TELAILO POSTERIORE SCREW, LOWER REAR FRAME ATTACHMENT	M8 x 1.25	800 min.	25.5	2.6	
8B00 69056	VITE FISS. TELAILO-PIASTRA ROTORE SCREW, ENGINE-FRAME PLATE ATTACH	M8 x 1.25	800 min.	35.3	3.6	- LOCTITE 270
8E00 69056	VITE FISS. TELAILO SUPERIORE-PIASTRA ROTORE SCREW, UPPER FRAME-ENGINE PLATE ATTACH	M8 x 1.25	800 min.	35.3	3.6	- LOCTITE 270
8100 69056	VITE FISS. TELAILO INFERIORE-PIASTRA ROTORE SCREW, LOWER FRAME-ENGINE PLATE ATTACH	M8 x 1.25	800 min.	35.3	3.6	- LOCTITE 270
8000 80277	VITE FISS. TELAILO-PIASTRA ROTORE SCREW, ENGINE-FRAME PLATE ATTACH	M8 x 1.25	1000 min.	35.3	3.6	
8C00 69112	VITE FISS. INFERIORE TELAILO POSTERIORE LOWER REAR FRAME FASTENING SCREW	M8 x 1.25	1000 min.	25.5	2.6	
8000 69111	VITE FISSAGGIO SUPERIORE TELAILO POSTERIORE SCREW, UPPER REAR FRAME ATTACHMENT	M8 x 1.25	800 min.	25.5	2.6	
8000 61357	VITE FISSAGGIO SUPERIORE TELAILO POSTERIORE SCREW, UPPER REAR FRAME ATTACHMENT	M8 x 1.25	800 min.	25.5	2.6	-SOLO MOD. VRE, SM -VRE, SM MODELS ONLY
8000 43928	VITE FISSAGGIO SUPERIORE/INFERIORE TELAILO POSTERIORE NUT, UPPER/LOWER REAR FRAME ATTACHMENT	M8 x 1.25	800 min.	25.5	2.6	
8000 73458	VITE FISSAGGIO ANTERIORE ROTORE SCREW, ENGINE FRONT ATTACHMENT	M8 x 1.25	1000 min	35.3	3.6	-SOLO MOD. 250cc, 360cc -250cc, 360cc MODELS ONLY
8A00 73458	VITE FISSAGGIO ANTERIORE ED INFERIORE ROTORE SCREW, ENGINE UPPER AND LOWER ATTACHMENT	M8 x 1.25	1000 min.	35.3	3.6	-SOLO MOD. 250cc, 360cc -250cc, 360cc MODELS ONLY
8G00 73458	VITE FISSAGGIO INFERIORE ROTORE SCREW, ENGINE LOWER ATTACHMENT	M8 x 1.25	1000 min.	35.3	3.6	
8N00 73458	VITE FISSAGGIO ANTERIORE ROTORE SCREW, ENGINE FRONT ATTACHMENT	M8 x 1.25	1000 min	35.3	3.6	-SOLO MOD. 125cc -125cc MODELS ONLY
8P00 73458	VITE FISSAGGIO INFERIORE ROTORE SCREW, ENGINE LOWER ATTACHMENT	M8 x 1.25	1000 min.	35.3	3.6	-SOLO MOD. 125cc -125cc MODELS ONLY
8000 62795	VITE FISSAGGIO PIASTRA - TELAILO SCREW, PLATE - FRAME ATTACHMENT	M8 x 1.25	800 min.	25.5	2.6	-SOLO MOD. VR, CR -VR, CR MODELS ONLY
8000 62795	VITE FISSAGGIO PIASTRA - ROTORE SCREW, PLATE - ENGINE ATTACHMENT	M8 x 1.25	800 min.	25.5	2.6	- LOCTITE 243
8000 97976	VITE ROTAZIONE Gamba laterale SCREW, SIDE STAND ROTATION	M8 x 1.25	800 min.	11.75	1.2	-SOLO MOD. VR -VR MODELS ONLY
8000 97977	VITE ROTAZIONE Gamba laterale SCREW, SIDE STAND ROTATION	M8 x 1.25	800 min.	11.75	1.2	-SOLO MOD. TE -TE MODELS ONLY
8A00 97977	VITE ROTAZIONE Gamba laterale SCREW, SIDE STAND ROTATION	M8 x 1.25	800 min.	11.75	1.2	- LOCTITE 243
8000 A0266	VITE ROTAZIONE Gamba laterale SCREW, SIDE STAND ROTATION	M8 x 1.25	800 min.	11.75	1.2	- LOCTITE 243
8A00 62797	VITE FISSAGGIO PIASTRA-TESTA ROTORE SCREW, ENGINE HEAD- PLATE ATTACHMENT	M10 x 1.25	1000 min.	27.95	2.85	-SOLO MOD. 250cc-360cc -ONLY 250cc-360cc MOD.
8000 62795	VITE FISSAGGIO PIASTRA-TESTA ROTORE SCREW, ENGINE HEAD- PLATE ATTACHMENT	M8 x 1.25	800 min.	25.5	2.6	-SOLO MOD. VR 125cc, CR 125cc -VR 125-CR 125 MODELS ONLY
8B00 69056	VITE FISS. SUPPORTO POGGIPIEDI POST. REAR FOOT REST SUPPORT FAST. SCREW	M8 x 1.25	800 min.	25.5	2.6	-SOLO MOD. VRE, SM -VRE, SM MODELS ONLY
8000 62725	VITE FISS. TASCETTA ENGINE STOP ENGINE STOP CLIP SCREW	M6 x 1	800 min.	10.4	1.05	-SOLO MOD. CR -CR MODELS ONLY
8000 62725	VITE FISS. SERRATURA CASCO HELMET LOCK FASTENING SCREW	M6 x 1	800 min.	10.4	1.05	-SOLO MOD. VRE, SM -VRE, SM MODELS ONLY
8000 60898	VITE FISS. RIPARO COLLA ROTORE SCREW, ENGINE GUARD ATTACH	M6 x 1	1000 min.	14.7	1.5	
8000 62627	VITE FISS. PIASTRA CAVALLETTINO SCREW, SIDE STAND PLATE ATTACHMENT	M6 x 1	800 min.	10.4	1.05	-SOLO MOD. TE/02 -TE/02 MODELS ONLY

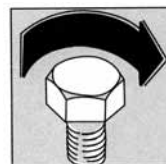
1 Nm = 0.73756 ft/lb

NOTE: Unless otherwise specified, standard torque values for the different thread sizes are as follows

M5x0.8	5.6-6.2 Nm	0.57-0.63 Kgm	4.1-4.5 ft/lb
M6x1	7.6-8.4 Nm	0.80-0.85 Kgm	5.8-6.1 ft/lb
M8x1.25	24-26 Nm	2.4-2.6 Kgm	17.3-18.8 ft/lb



TIGHTENING TORQUE FIGURES



TIGHTENING TORQUE FIGURES (+/- 5%) HANDLEBAR AND CONTROLS (99669)

N° DISEGNO DRAWING N°	DESCRIZIONE DESCRIPTION	DIMENSIONI DIMENSIONS	CLASSE DI RESISTEN. PROPERTY CLASS	COPPIA DI SERRAGGIO TORQUE WRENCH SETTINGS		NOTE NOTES
			N / mmq	N m ±5%	Kg m ±5%	
8000 62729	VITE FISS. CAVALLOTTO CON. FRIZIONE E FRENO ANTERIORE SCREW, CLUTCH AND FRONT BRAKE U-BOLT ATTACH.	M6 x 1	800 min	4.9	0.5	
8000 62728	VITE FISS. CAVALLOTTO CON. FRIZIONE E FRENO ANTERIORE SCREW, CLUTCH AND FRONT BRAKE U-BOLT ATTACH.	M6 x 1	800 min	4.9	0.5	
8000 62728	VITE FISS. SUPPORTI CORDONE GAS SCREW, GAS SUPPORTS ATTACH.	M6 x 1	800 min	4.9	0.5	
8000 57155	VITE FISS. RACCORDO TUBO POMPA FRENO ANT. (DIS. 77740) SCREW, FRONT MASTER CYLINDER PIPE UNION	M10 x 1	500 min	19.0	1.95	DATI SERR. BREMBO: 17 - 20 Nm
8000 57155	VITE FISS. RACCORDO TUBO POMPA FRENO ANT. (DIS. 93109) SCREW, FRONT MASTER CYLINDER PIPE UNION	M10 x 1	500 min	24.7	2.5	-SOLO MOD. CR, TC (-CR, TC MODELS ONLY) (DATI SERR. BREMBO: 23 - 26 Nm)
8000 55902	VITE FISSAGGIO PEDALE FRENO SCREW, BRAKE PEDAL ATTACHMENT	M10 x 1.25	1200 min	41.65	4.25	(A) -LOCTITE 243
8000 62726	VITE FISSAGGIO POMPA FRENO POSTERIORE SCREW, REAR BRAKE PUMP ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8000 57155	VITE FISS. RACCORDO TUBO POMPA FRENO POST. SCREW, REAR MASTER CYLINDER PIPE UNION	M10 x 1	500 min	19.0	1.95	-SOLO MOD. CR (-CR MODELS ONLY) (-DATI SERR. BREMBO: 17 - 20 Nm)
8000 62725	VITE FISSAGGIO PIASTRINA-POMPA FRENO ANT. SCREW, PLATE-FRONT BRAKE PUMP ATTACHMENT	M6 x 1	800 min.	10.4	1.05	-SOLO MOD. TE, SHR (-SHR MODELS ONLY)
8000 62725	VITE FISSAGGIO SERBATOIO LIQUIDO FRENO SCREW, BRAKE FLUID TANK ATTACHMENT	M6 x 1	800 min.	2.45	0.25	
8000 62727	VITE FISSAGGIO SERBATOIO LIQUIDO FRENO SCREW, BRAKE FLUID TANK ATTACHMENT	M6 x 1	800 min.	2.45	0.25	
8000 62727	VITE FISSAGGIO POMPA FRENO POSTERIORE SCREW, REAR BRAKE PUMP ATTACHMENT	M6 x 1	800 min.	2.45	0.25	
8000 37891	INTERRUTTORE STOP STOP SWITCH	M10 x 1		19.0	1.5	-SOLO MOD. VR, VRE, SM (-VR, VRE, SM MODELS ONLY) (DATI SERR. BREMBO: 17 - 20 Nm)
8000 94849	INTERRUTTORE STOP STOP SWITCH	M10 x 1		19.0	1.5	-SOLO MOD. TE, SHR (-TE, SHR MODELS ONLY) (DATI SERR. BREMBO: 17 - 20 Nm)
60N1 07701	VITE FISS. CONNETTORE-INTERRUTTORE STOP SCREW, JACK-STOP SWITCH	M2 x 0.4		0.84	0.09	-SOLO MOD. SHR (-SHR MODELS ONLY)
8A00 55241	VITE FISS. CANNA REGOLAZIONE PEDALE FRENO BRAKE LEVER ADJUSTMENT CAM FASTENING SCREW	M6 x 1	1000 min.	14.7	1.95	
8A00 67997	VITE FISS. PIASTRINA GUIDAFILO SCREW, THREAD PLATE ATTACHMENT	M6 x 1	800 min.	6.0	0.6	(A)
8000 62730	VITE FISS. PIASTRINA-SERBATOIO LIQUIDO FRENO ANT. SCREW, PLATE-FRONT BRAKE FLUID TANK ATTACH.	M6 x 1	800 min.	2.45	0.25	-SOLO MOD. SHR (-SHR MODELS ONLY)
8000 62712	VITE FISS. TAPPO SERBATOIO OLIO FRENO SCREW, BRKE FLUID TANK CAP ATTACH	M3 x 0.5		1.5	0.15	-SOLO MOD. SHR (-SHR MODELS ONLY)
8000 62728	VITE FISS. CAVALLOTTO SCREW, U-BOLT ATTACH	M6 x 1	800 min.	4.9	0.5	

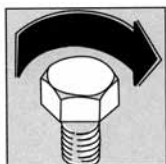
1 Nm = 0.73756 ft/lb

TIGHTENING TORQUE FIGURES (+/- 5%) FRONT SUSPENSION (99669)

N° DISEGNO DRAWING N°	DESCRIZIONE DESCRIPTION	DIMENSIONI DIMENSIONS	CLASSE DI RESISTEN. PROPERTY CLASS	COPPIA DI SERRAGGIO TORQUE WRENCH SETTINGS		NOTE NOTES
			N / mmq	N m ±5%	Kg m ±5%	
8000 62796	VITE FISSAGGIO GAMBE FORCELLA SCREW, FORK LEGS ATTACHMENT	M8 x 1.25	800 min.	25.0	2.55	-SOLO MOD. VR, CR (-VR, CR MODELS ONLY) (-DATI SERR. MARZOCCHI: 25 Nm)
60N1 02557	VITE FISSAGGIO GAMBE FORCELLA SCREW, FORK LEGS ATTACHMENT	M8 x 1.25	800 min.	25.0	2.55	-SOLO MOD. VRE, SM (-VRE, SM MODELS ONLY) (-DATI SERR. MARZOCCHI: 25 Nm)
8000 62729	VITE BLOCCAGGIO PERNO RUOTA ANTER. SCREW, FRONT WHEEL PIN LOCKING	M6 x 1	800 min.	10.4	1.05	-DATI SERR. MARZOCCHI: 10 Nm (-MARZOCCHI TORQUE V. SET: 10 Nm)
8000 83395	GHIERA PERNO DI STERZO STEERING PIN RING NUT	M25 x 1	600 min.	3.45	0.35	
8A00 87717	GHIERA PERNO DI STERZO STEERING PIN RING NUT	M25 x 1	600 min.	3.45	0.35	-SOLO MOD. TC, CR (-TC, CR MODELS ONLY)
8000 69315	DADO PER PERNO DI STERZO NUT, STEERING PIN ATTACHMENT	M24 x 1	400 min	83.3	8.5	
8000 62733	VITE FISSAGGIO MORSETTO SUPER. MANUBRIO SCREW, UPPER CLAMP ATTACHMENT	M8 x 1.25	800 min.	28.4	2.9	
8C00 69056	VITE FISSAGGIO MORSETTO SUPER. MANUBRIO SCREW, UPPER CLAMP ATTACHMENT	M8 x 1.25	800 min.	28.4	2.9	-SOLO MOD. VR, CR (-VR, CR MODELS ONLY)
60N1 01219	VITE FISSAGGIO SUPPORTO MANUBRIO SCREW, HANDLEBAR HOLDER ATTACHMENT	M10 x 1.5	800 min.	21.1	2.15	
8000 67997	VITE FISSAGGIO PARASTELLI SCREW, FORK LEGS GUARD ATTACHMENT	M5 x 0.8	800 min.	7.85	0.8	
8B00 66525	VITE FISSAGGIO ANELLI SCREW, RINGS ATTACHMENT	M5 x 0.8	800 min.	2.45	0.25	

1 Nm = 0.73756 ft/lb





TIGHTENING TORQUE FIGURES

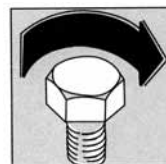
TIGHTENING TORQUE FIGURES (+/- 5%) REAR SUSPENSION (99669)

N° DISEGNO DRAWING N°	DESCRIZIONE DESCRIPTION	DIMENSIONI DIMENSIONS	CLASSE DI RESISTEN. PROPERTY CLASS	COPPIA DI SERRAGGIO TORQUE WRENCH SETTINGS		NOTE NOTES
			N / mmq	N m ±5%	Kg m ±5%	
8000 71623	DADO FISS. PERNO FORCELLONE NUT, REAR FORK PIN ATTACH	M16 x 1.5	1000 min	122.5	12.5	- LOCTITE 243
8A00 69138	VITE FISSAGGIO TELAIN - TIRANTE SCREW, FRAME-TIE ROD ATTACHMENT	M10 x 1.25	1000 min.	73.6	7.5	-SOLO MOD. VR, VRE, SM -VR, VRE, SM MODELS ONLY
8000 42023	DADO FISS. BILANCIERE-FORCELLONE/TIRANTE-BILANCIERE NUT, ROCKER ARM-R.FORK/TIE ROD-ROCKER ARM	M12 x 1.25	600 min.	80	8.2	-SOLO MOD. VR (MOD.VRE, SM SOLO PER TIRANTE-BIL.) -VR MODELS ONLY (VRE, SM MOD. FOR TIE ROD-R.A. ONLY)
8000 42023	DADO FISS. BILANCIERE-FORCELLONE/TIRANTE-BILANCIERE NUT, ROCKER ARM-R.FORK/TIE ROD-ROCKER ARM	M12 x 1.25	600 min.	80	8.2	-SOLO MOD. CR -CR MODELS ONLY
8000 42023	DADO FISSAGGIO TELAIN - TIRANTE NUT, FRAME-TIE ROD ATTACHMENT	M12 x 1.25	600 min.	80	8.2	-SOLO MOD. CR -CR MODELS ONLY
8000 42023	DADO FISS. BILANCIERE-FORCELLONE NUT, ROCKER ARM-R.FORK	M12 x 1.25	600 min.	80	8.2	-SOLO MOD. VRE, SM -VRE, SM MODELS ONLY
8000 01412	INGRASSATORE LUBRICATOR	M6 x 1		2.95	0.3	
8A00 62797	VITE FISS. AMMORTIZZ. - TELAIN/BILANCIERE-TELAIN SCREW, SHOCK ABSORBER-FRAME/ROCKER ARM-FRAME	M10x1.25	800 min.	52.4	5.35	
8D00 62797	VITE FISS. BILANCIERE-AMMORTIZZATORE SCREW, ROCKER ARM-SHOCK ABSORBER	M10x1.25	800 min.	52.4	5.35	
8D00 62797	VITE FISS. TELAIN-AMMORTIZZATORE SCREW, FRAME-SHOCK ABSORBER	M10x1.25	800 min.	52.4	5.35	
8000 62795	VITE FISSAGGIO STAFFA GUIDACATENA-FORCELLONE SCREW, DRIVE CHAIN SLIDE-REAR FORK ATTACHMENT	M8 x 1.25	800 min.	25.0	2.55	-SOLO MOD. VR, VRE, SM -VR, VRE, SM MODELS ONLY
8000 62731	VITE FISSAGGIO GUIDACATENA - STAFFA SCREW, DRIVE CHAIN - PLATE ATTACHMENT	M6 x 1	800 min.	2.0	0.2	- LOCTITE 243
8000 62795	VITE FISSAGGIO ANT. STAFFA GUIDACATENA - FORCELL. SCREW, DRIVE CHAIN FRONT ATTACHMENT	M8 x 1.25	800 min.	10.4	1.05	-SOLO MOD. CR, TC -CR, TC MODELS ONLY - LOCTITE 243
8000 62725	VITE FISSAGGIO POST. STAFFA GUIDACATENA - FORCELL. SCREW, DRIVE CHAIN REAR ATTACHMENT	M6 x 1	800 min.	10.4	1.05	-SOLO MOD. CR, TC -CR, TC MODELS ONLY - LOCTITE 243
8000 67997	VITE FISS. INF. PATTINO CATENA E PASSATUBO FRENO SCREW, CHAIN SLIDE, LOWER ATTACH AND PIPE BR. CLAMP	M5 x 0.8	800 min.	4.4	0.45	-ANCHE PER FISSAGGIO SUP. MODELLI CR, TC -ALSO FOR UPPER ATTACH., CR, TC MODELS
8A00 67997	VITE FISS. SUP. - ANTERIORE COPRICATENA SCREW, CHAIN GUARD UPPER-FRONT ATTACH.	M5 x 0.8	800 min.	4.4	0.45	
8C00 67997	VITE FISS. SUP. - ANTERIORE COPRICATENA E PATTINO SCREW, CHAIN SLIDE AND GUARD UPPER-FRONT ATTACH.	M5 x 0.8	800 min.	4.4	0.45	
8000 20536	VITE FISS. POST. PATTINO CATENA E PASSATUBO POST. SCREW, REAR PIPE AND CHAIN SLIDE REAR ATTACH	D=4.8		4.4	0.45	-SOLO MOD. CR, TC -CR, TC MODELS ONLY
60N1 01059	VITE FISS. NOSTO ED ANTERIORE COPRICATENA SCREW, CHAIN GUARD REAR AND FRONT ATTACH.	M5 x 0.8	800 min.	4.4	0.45	
8000 17810	DADO FISS. TENDICATENA NUT, CHAIN STRETCHER ATTACH.	M8 x 1.25	600 min.	22.5	2.3	
8E00 67545	VITE FISS. GUIDACATENA SCREW, DRIVE CHAIN ATTACHMENT	M6 x 1	800 min.	10.4	1.05	

1 Nm = 0.73756 ft/lb



TIGHTENING TORQUE FIGURES



TIGHTENING TORQUE FIGURES (+/- 5%) FAIRINGS AND MUDGUARDS (99669)

N° DISEGNO DRAWING N°	DESCRIZIONE DESCRIPTION	DIMENSIONI DIMENSIONS	CLASSE DI RESISTEN. PROPERTY CLASS	COPPIA DI SERRAGGIO TORQUE WRENCH SETTINGS		NOTE NOTES
			N / mmq	N m ±5%	Kg m ±5%	
8000 36467	VITE FISSAGGIO CONVOGLIATORE A SERBATOIO SCREW CONVEYOR-TANK ATTACHMENT	M6 x 1	800 min.	6.0	0.6	
8000 62726	VITE FISSAGGIO INFERIORE PORTANUMERO ANTERIORE SCREW LOWER PANEL FRONT ATTACHMENT	M6 x 1	800 min.	10.4	1.05	-SOLO MOD. CR, TC -CR, TC MODELS ONLY
8000 62726	VITE FISSAGGIO PROTEZIONE AMMORTIZZATORE SCREW SHOCK ABSORBER PROTECTION ATTACHMENT	M6 x 1	800 min.	6.0	0.6	
8000 62726	-VITE FISS. PORTATARGA -SCREW PLATE HOLDER ATTACH	M6 x 1	800 min.	6.0	0.6	-SOLO MOD. TE -TE MODELS ONLY
8000 62726	-VITE FISS. POS. PARAFANGO POSTERIORE E RINFORZI -SCREW REAR MUDGUARD & REINFORCEMENTS REAR ATTACH	M6 x 1	800 min.	6.0	0.6	
8000 62726	VITE FISSAGGIO INFERIORE PORTANUMERO SCREW LOW MUDGUARD BOARD ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8000 62726	VITE FISSAGGIO PANNELLO/PORTANUMERO LATERALE SCREW LOWER/SIDE PANEL ATTACHMENT	M6 x 1	800 min.	3.45	0.35	
8000 62727	VITE FISSAGGIO PARAFANGO ANTERIORE SCREW FRONT MUDGUARD ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8000 62727	VITE FISSAGGIO PROTEZIONE RADIATORE SCREW RADIATOR GUARD ATTACHMENT	M6 x 1	800 min.	6.0	0.6	
8000 62727	VITE FISSAGGIO PORTANUMERO LATERALE SCREW SIDE PANELS ATTACHMENT	M6 x 1	800 min.	3.45	0.35	
8000 62727	VITE FISS. POST. PANNELLO LATERALE DX E SX SCREW RH AND LH SIDE PANEL REAR ATTACH	M6 x 1	800 min.	3.45	0.35	
8000 62727	VITE FISS. PROTEZIONE INF. AMMORTIZZATORE POST. SCREW REAR SHOCK ABSORBER PROTECTION GUARD ATTACH	M6 x 1	800 min.	6.0	0.6	
8000 62727	-VITE FISS. PORTATARGA -SCREW PLATE HOLDER ATTACH	M6 x 1	800 min.	6.0	0.6	-SOLO MOD. VR, VE -VR, VE MODELS ONLY
8000 62727	VITE FISSAGGIO PANNELLO/PORTAN. LATERALE-TELAIETTO SCREW LOWER/SIDE PANEL-REAR FRAME ATTACHMENT	M6 x 1	800 min.	6.0	0.6	
8000 62728	VITE FISS. PANNELLO/PORTAN. LATERALE-SCATOLA FILTRO SCREW LOWER/SIDE PANEL-FILTER AIR BOX ATTACHMENT	M6 x 1	800 min.	6.0	0.6	
8000 62728	VITE FISSAGGIO PARAFANGO POSTERIORE SCREW REAR MUDGUARD ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8000 62728	-VITE FISS. ANT. PANNELLO LATERALE DX -SCREW RH SIDE PANEL FRONT ATTACH	M6 x 1	800 min.	3.45	0.35	
8000 62730	VITE FISSAGGIO CUPOLINO PORTAFARO SCREW HEADLAMP FAIRING ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8000 67997	VITE FISSAGGIO SUPERIORE PORTANUMERO ANTERIORE SCREW UPPER PANEL FRONT ATTACHMENT	M5 x 0.8	800 min.	6.0	0.6	-SOLO MOD. CR, TC -CR, TC MODELS ONLY
8000 67997	-VITE FISS. SUP. ANTERIORE COPRICATERA -SCREW CHAIN GUARD UPPER - FRONT ATTACH	M5 x 0.8		4.4	0.45	-SOLO MOD. VR, VRE, SW -VR, VRE, SW MODELS ONLY
8000 36467	-VITE FISS. CONVOGLIATORI A SERBATOIO -SCREW CONVEYORS TO TANK ATTACH	M6 x 1	800 min.	6.0	0.6	
8000 67545	-VITE FISS. SUP. PROTEZIONE AMMORTIZZATORE -SCREW SHOCK ABS. GUARD UPPER ATTACH	M6 x 1	800 min.	6.0	0.6	
8000 67545	-VITE FISS. ANT. PANNELLO LATERALE SX -SCREW LH SIDE PANEL FRONT ATTACH	M6 x 1	800 min.	3.45	0.35	
8000 40717	NOO FISS. CADADOTTO -NUT, REAR REFLECTOR ATTACH	M4 x 0.7	600 min.	1.9	0.2	
8000 37283	VITE FISS. ANELLO A CUPOLINO SCREW RING-HEADLAMP FAIRING ATTACH	D = 3.5		1.9	0.2	

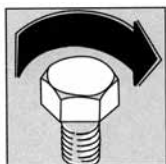
1 Nm = 0.73756 ft/lb

TIGHTENING TORQUE FIGURES (+/- 5%) ELECTRICAL SYSTEM (99669)

N° DISEGNO DRAWING N°	DESCRIZIONE DESCRIPTION	DIMENSIONI DIMENSIONS	CLASSE DI RESISTEN. PROPERTY CLASS	COPPIA DI SERRAGGIO TORQUE WRENCH SETTINGS		NOTE NOTES
			N / mmq	N m ±5%	Kg m ±5%	
8000 62728	VITE FISSAGGIO INDICATORI DI DIREZIONE SCREW BLINKERS ATTACHMENT	M6 x 1	800 min.	6.0	0.6	-SOLO MOD. TE-SMR -TE-SMR MODELS ONLY (LOCTITE 243 PER GRUPPO OTTICO)
8000 62726	VITE FISSAGGIO VISITORE AUSTICO SCREW HORN ATTACHMENT	M6 x 1	800 min.	10.4	1.05	-SOLO MOD. VR, VRE, SW -VR, VRE, SW MODELS ONLY
60N4 95615	VITE FISSAGGIO GRUPPO OTTICO POSTERIORE SCREW REAR OPTICAL GROUP ATTACHMENT	D = 3.9		1.45	0.15	-SOLO MOD. TE-SMR-VRE -TE-SMR-VRE MODELS ONLY
60N4 98033	VITE FISSAGGIO GRUPPO OTTICO ANTERIORE SCREW FRONT OPTICAL GROUP ATTACHMENT	D = 3.9		1.45	0.15	
8000 A0953	VITE FISSAGGIO GRUPPO OTTICO POSTERIORE SCREW REAR OPTICAL GROUP ATTACHMENT	D = 3.9		1.45	0.15	
8000 62725	VITE FISSAGGIO MASSA SCREW EARTH ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8000 62725	VITE FISS. FASCETTA TERRA SCREW CLIP ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8SA0 67545	VITE FISSAGGIO CAVI TELEFONICI SCREW STARTER CABLES ATTACHMENT	M6 x 1	800 min.	10.4	1.05	

1 Nm = 0.73756 ft/lb





TIGHTENING TORQUE FIGURES

TIGHTENING TORQUE FIGURES (+/- 5%) FUEL SYSTEM (99669)

N° DISEGNO DRAWING N°	DESCRIZIONE DESCRIPTION	DIMENSIONI DIMENSIONS	CLASSE DI RESISTEN. PROPERTY CLASS	COPPIA DI SERRAGGIO TORQUE WRENCH SETTINGS		NOTE NOTES
			N / mmq	N m ±5%	Kg m ±5%	
8000 41240	VITE FISSAGGIO TAMPONE PER SERBATOIO SCREW, PAD ATTACHMENT	M8 x 1.25	800 min.	22.5	2.3	
60N1 02507	VITE FISSAGGIO TAMPONE PER SERBATOIO SCREW, PAD ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8000 37745	VITE FISSAGGIO RUBINETTO BENZINA SCREW, FUEL COCK ATTACHMENT	O = 5.5	--	2.45	0.25	
8A00 67545	VITE FISSAGGIO POSTERIORE SERBATOIO SCREW, TANK REAR ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
60N1 04134	VITE FISSAGGIO ATT. SELLA SU SERBATOIO SCREW, SEAT ATTACHMENT ON FUEL TANK	M6 x 1	500 min.	6.0	0.6	
60N1 04134	VITE FISSAGGIO DISTANZIALE SELLA SCREW, SEAT SPACER ATTACHMENT	M6 x 1	500 min.	6.0	0.6	
8D00 67545	VITE FISSAGGIO DISTANZIALE SELLA SCREW, SEAT SPACER ATTACHMENT	M6 x 1	500 min.	6.0	0.6	
8000 62725	VITE FISSAGGIO ANTERIORE SCATOLA FILTRO SCREW, FILTER BOX FRONT ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8000 62726	VITE FISSAGGIO ANTERIORE SCATOLA FILTRO SCREW, FILTER BOX FRONT ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8000 62726	VITE FISSAGGIO ANTERIORE SERBATOIO SCREW, TANK FRONT ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8000 62727	VITE FISSAGGIO COPERCHIO SCATOLA FILTRO SCREW, FILTER BOX COVER ATTACHMENT	M6 x 1	800 min.	3.5	0.35	
8000 62728	VITE FISSAGGIO POSTERIORE SCATOLA FILTRO SCREW, FILTER BOX REAR ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8000 40718	DADO FISSAGGIO FLANGIA SCATOLA FILTRO NUT, FILTER BOX FLANGE ATTACHMENT	M5 x 0.8	600 min.	3.45	0.35	

1 Nm = 0.73756 ft/lb

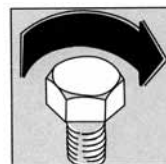
TIGHTENING TORQUE FIGURES (+/- 5%) WHEELS AND BRAKES (99669)

N° DISEGNO DRAWING N°	DESCRIZIONE DESCRIPTION	DIMENSIONI DIMENSIONS	CLASSE DI RESISTEN. PROPERTY CLASS	COPPIA DI SERRAGGIO TORQUE WRENCH SETTINGS		NOTE NOTES
			N / mmq	N m ±5%	Kg m ±5%	
8000 62733	VITE FISSAGGIO PIAZZA FRENO ANTERIORE SCREW, FRONT BRAKE CALIPER ATTACHMENT	M8 x 1.25	800 min.	25.5	2.6	
8000 57155	VITE FISS. RACCORDO TUBO PIAZZA FRENO ANT. E POST. SCREW, FRONT AND REAR CALIPER PIPE UNION	M10 x 1	500 min.	19.0	1.95	-DATI SERR. BREMBO: 17 - 20 Nm -BREMBO TORQUE W. SET: 17 - 20 Nm
8000 48773	VITE FISSAGGIO PERNO RUOTA ANTERIORE SCREW, FRONT WHEEL PIN ATTACHMENT	M10 x 1.5	1200 min.	51.45	5.25	
8000 94060	VITE FISSAGGIO PIAZZA FRENO ANTERIORE A PIASTRA SCREW, FRONT BRAKE CALIPER-PLATE ATTACH.	M10 x 1.5	800 min.	25.5	2.6	-SOLO MODELLI SMR -SMR MODELS ONLY
8000 94060	VITE FISSAGGIO PIASTRA A PIEDINO SCREW, FRONT BRAKE CALIPER-BOTTOM FORK ATTACH.	M10 x 1.5	800 min.	25.5	2.6	-SOLO MODELLI SMR -SMR MODELS ONLY
8000 96933	TAPPO PERNO RUOTA ANTERIORE FRONT WHEEL PIN PLUG	M20 x 1.5		51.45	5.25	-SOLO MODELLI TC -TC MODELS ONLY
8A00 55241	VITE FISSAGGIO DISCO FRENO ANTERIORE SCREW, FRONT BRAKE DISC ATTACHMENT	M6 x 1	1000 min.	14.7	1.5	- LOCTITE 243
69N4 29004	NIPPLES PER RAGGIO RUOTA ANTERIORE FRONT WHEEL SPOKE NIPPLES	M4.07x0.75		4.4	0.45	
8000 A0081	NIPPLES PER RAGGIO RUOTA ANTERIORE FRONT WHEEL SPOKE NIPPLES	M4.07x0.75		4.4	0.45	
8000 43928	DADO FRENO FISSAGGIO CORONA NUT, SPROCKET ATTACHMENT	M8 x 1.25	800 min.	34.3	3.5	- LOCTITE 243
8000 55878	VITE FISSAGGIO DISCO FRENO POSTERIORE SCREW, REAR BRAKE DISC ATTACHMENT	M6 x 1	1000 min.	14.7	1.5	- LOCTITE 243
8000 62726	VITE FISSAGGIO DISCO FRENO POSTERIORE SCREW, REAR BRAKE DISC ATTACHMENT	M6 x 1	1000 min.	14.7	1.5	- LOCTITE 243
8000 96940	PERNO RUOTA POSTERIORE REAR WHEEL PIN	M20 x 1.5	1000 min.	142.1	14.5	-SOLO MOD. VR, CR -VR, CR MODELS ONLY
8D00 64938	PERNO RUOTA POSTERIORE REAR WHEEL PIN	M20 x 1.5	1000 min.	142.1	14.5	-SOLO MOD. VRE, SM -VRE, SM MODELS ONLY
69N4 29005	NIPPLES PER RAGGIO RUOTA POSTERIORE FRONT WHEEL SPOKE NIPPLES	M4.5x0.75		4.4	0.45	
8000 A0086	NIPPLES PER RAGGIO RUOTA POSTERIORE FRONT WHEEL SPOKE NIPPLES	M4.5x0.75		4.4	0.45	
8000 93072	DADO PERNO RUOTA POSTERIORE NUT, REAR WHEEL PIN	M20 x 1.5	1000 min.	142.1	14.5	
8000 62153	VITE FISSAGGIO PIGNONE SCREW, PINION ATTACHMENT	M8 x 1.25	800 min.	24.6	2.5	-SOLO MOD. VR 360 -VR 360 MODELS ONLY
60N1 01140	VITE FISSAGGIO PIGNONE SCREW, PINION ATTACHMENT	M8 x 1.25	800 min.	24.6	2.5	-SOLO MOD. VRE -VRE MODELS ONLY
8A00 92876	VITE FISSAGGIO DISCO FRENO ANTERIORE SCREW, FRONT BRAKE DISC ATTACHMENT	M8 x 1.25	1000 min.	34.7	3.54	
8000 28327	VITE FISS. PIASTRA COPRICATENA A CARTER SCREW, CHAIN GUARD PLATE-CARTER	M6 x 1	800 min.	10.4	1.05	
8000 62725	VITE FISS. COPERCHIO A PIASTRA SCREW, CAP-PLATE ATTACHMENT	M6 x 1	800 min.	10.4	1.05	

1 Nm = 0.73756 ft/lb



TIGHTENING TORQUE FIGURES



TIGHTENING TORQUE FIGURES (+/- 5%) EXHAUST (99669)

N° DISEGNO DRAWING N°	DESCRIZIONE DESCRIPTION	DIMENSIONI DIMENSIONS	CLASSE DI RESISTEN. PROPERTY CLASS	COPPIE DI SERRAGGIO TORQUE WRENCH SETTINGS		NOTE NOTES
			N / mmq	N m +5%	Kg m +5%	
8000 62725	VITE FISSAGGIO RACCORDO SILENZIATORE A TELAI SCREW, SILENT PIPE UNION TO FRAME ATTACH.	M6 x 1	800 min.	10.4	1.05	
8000 62725	VITE FISSAGGIO ANTIVIBRANTE AL TELAI E AL TUBO SCREW, SILENT BLOCK TO FRAME AND PIPE ATTACH.	M6 x 1	800 min.	10.4	1.05	
8000 62726	VITE FISSAGGIO ANTIVIBRANTE AL TUBO SCREW, SILENT BLOCK TO PIPE ATTACH.	M6 x 1	800 min.	10.4	1.05	-SOLO MOD. SM -SM MODELS ONLY
8000 62730	VITE FISSAGGIO SILENZIATORE SCREW, EXHAUST ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8A00 67545	VITE FISSAGGIO ANTERIORE SILENZIATORE SCREW, FRONT EXHAUST ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8E00 67545	VITE FISSAGGIO POSTERIORE SILENZIATORE SCREW, REAR EXHAUST ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8000 62731	VITE FISSAGGIO POSTERIORE SILENZIATORE SCREW, REAR EXHAUST ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8000 60898	VITE FISSAGGIO GRIGLIA A TUBO SCARICO SCREW, GRILL TO EXHAUST PIPE ATTACH.	M6 x 1	1000 min.	14.7	1.5	
60N4 07335	VITE FISSAGGIO TUBO SCARICO ALLA TESTA SCREW, EXHAUST PIPE TO ENGINE HEAD ATTACH.	M6 x 1	800 min.	10.4	1.05	
8000 62726	VITE FISSAGGIO TUBO SCARICO ALLA TESTA SCREW, EXHAUST PIPE TO ENGINE HEAD ATTACH.	M6 x 1	800 min.	10.4	1.05	

1 Nm = 0.73756 ft/lb

TIGHTENING TORQUE FIGURES (+/- 5%) INSTRUMENTS (99669)

N° DISEGNO DRAWING N°	DESCRIZIONE DESCRIPTION	DIMENSIONI DIMENSIONS	CLASSE DI RESISTEN. PROPERTY CLASS	COPPIE DI SERRAGGIO TORQUE WRENCH SETTINGS		NOTE NOTES
			N / mmq	N m +5%	Kg m +5%	
8000 61313	DAVVO FISSAGGIO CONTAKH NUT, ODOMETER ATTACHMENT	M6 x 1	600 min.	6.0	0.6	-SOLO MOD. WRE, SM -WRE, SM MODELS ONLY
8000 67997	VITE FISSAGGIO PIASTRA SOSTEGNO CONTAKH SCREW, ODOMETER PLATE ATTACHMENT	M5 x 0.8	800 min.	6.0	0.6	-SOLO MOD. WRE, SM -WRE, SM MODELS ONLY
8A00 67997	VITE FISSAGGIO GUIDACABLO A PIASTRA DI STERZO SCREW, CABLE GUIDE-STEERING GEAR PLATE ATTACHMENT	M5 x 0.8	800 min.	6.0	0.6	-SOLO MOD. WRE, SM -WRE, SM MODELS ONLY
8B00 66525	VITE FISSAGGIO ANELLO GUIDA TRASMISSIONE SCREW, DRIVE GUIDE RING ATTACH.	M5 x 0.8	800 min.	2.45	0.25	-SOLO MOD. WRE, SM -WRE, SM MODELS ONLY
8B00 66525	VITE FISSAGGIO ANELLO CAVO CONTAKH SCREW, ODOMETER CABLE RING ATTACHMENT	M5 x 0.8	800 min.	2.45	0.25	-SOLO MOD. WRE, SM -WRE, SM MODELS ONLY
8000 89069	VITE FISSAGGIO STRUMENTO SCREW, INSTRUMENT ATTACHMENT	D=4.8		3.45	0.35	

1 Nm = 0.73756 ft/lb

TIGHTENING TORQUE FIGURES (+/- 5%) COOLING SYSTEM (99669)

N° DISEGNO DRAWING N°	DESCRIZIONE DESCRIPTION	DIMENSIONI DIMENSIONS	CLASSE DI RESISTEN. PROPERTY CLASS	COPPIE DI SERRAGGIO TORQUE WRENCH SETTINGS		NOTE NOTES
			N / mmq	N m +5%	Kg m +5%	
60N1 02525	VITE FISSAGGIO RADIATORE INTERIORE SCREW, INTERM. RADIATORS ATTACHMENT	M6 x 1	800 min.	7.0	0.72	
8000 62725	VITE FISSAGGIO ANELLO GUIDACABLO SCREW, PIPEGUIDE RING ATTACHMENT	M6 x 1	800 min.	10.4	1.05	
8000 62725	VITE FISSAGGIO RADIATORE SUPERIORE SCREW, UPPER RADIATORS ATTACHMENT	M6 x 1	800 min.	7.0	0.72	
8000 62728	VITE FISSAGGIO RADIATORE INFERIORE SCREW, LOWER RADIATORS ATTACHMENT	M6 x 1	800 min.	7.0	0.72	
8000 62729	VITE FISSAGGIO RADIATORI SCREW, RADIATORS ATTACHMENT	M6 x 1	800 min.	7.0	0.72	

1 Nm = 0.73756 ft/lb





TIGHTENING TORQUE FIGURES

NOTE: Unless otherwise specified, standard torque values for the different thread sizes are as follows (+/- 5%)

Steel screws on plastic, with metal spacers	M4	2 Nm	0.2 Kgm	1.45 ft/lb
Steel screws on brass, copper, aluminium	M4	2 Nm	0.2 Kgm	1.45 ft/lb
Steel screws on iron, steel	M4	3 Nm	0.3 Kgm	2.2 ft/lb
Steel screws on plastic, with metal spacers	M5	4 Nm	0.4 Kgm	3 ft/lb
Steel screws on brass, copper, aluminium	M5	4 Nm	0.4 Kgm	3 ft/lb
Steel screws on iron, steel	M5	6 Nm	0.6 Kgm	4.4 ft/lb
Steel screws on plastic, with metal spacers	M6	6.5 Nm	0.65 Kgm	4.8 ft/lb
Steel screws on brass, copper, aluminium	M6	6.5 Nm	0.65 Kgm	4.8 ft/lb
Steel screws on iron, steel	M6	10.5 Nm	1 Kgm	7.7 ft/lb
Steel screws on brass, copper, aluminium	M8	16 Nm	1.6 Kgm	11.8 ft/lb
Steel screws on iron, steel	M8	26 Nm	2.6 Kgm	19.1 ft/lb
Steel screws on iron, steel	M10	52 Nm	5.2 Kgm	38.3 ft/lb
Steel screws on iron, steel	M12	100 Nm	10 Kgm	73.8 ft/lb
Steel screws on iron, steel	M14	145 Nm	14.5 Kgm	107 ft/lb





Section

Y





CHASSIS AND WHEELS

Chassis.....	Y.3
Lubrication points (lubricant)	Y.4
Front wheel.....	Y.5
Front wheel removal.....	Y.6
Front wheel installation.....	Y.7
Rear wheel	Y.8
Rear wheel removal.....	Y.9
Tightening torque figures	Y.9
Wheel servicing	Y.10
Wheel axle warpage.....	Y.10
Axle runout over 100 mm	Y.10
Wheel spokes.....	Y.11
Wheel rim warpage.....	Y.11
Rear chain sprocket, secondary drive sprocket and chain.....	Y.12
Tightening torque figures	Y.12
Checking chain and sprockets for wear.....	Y.13



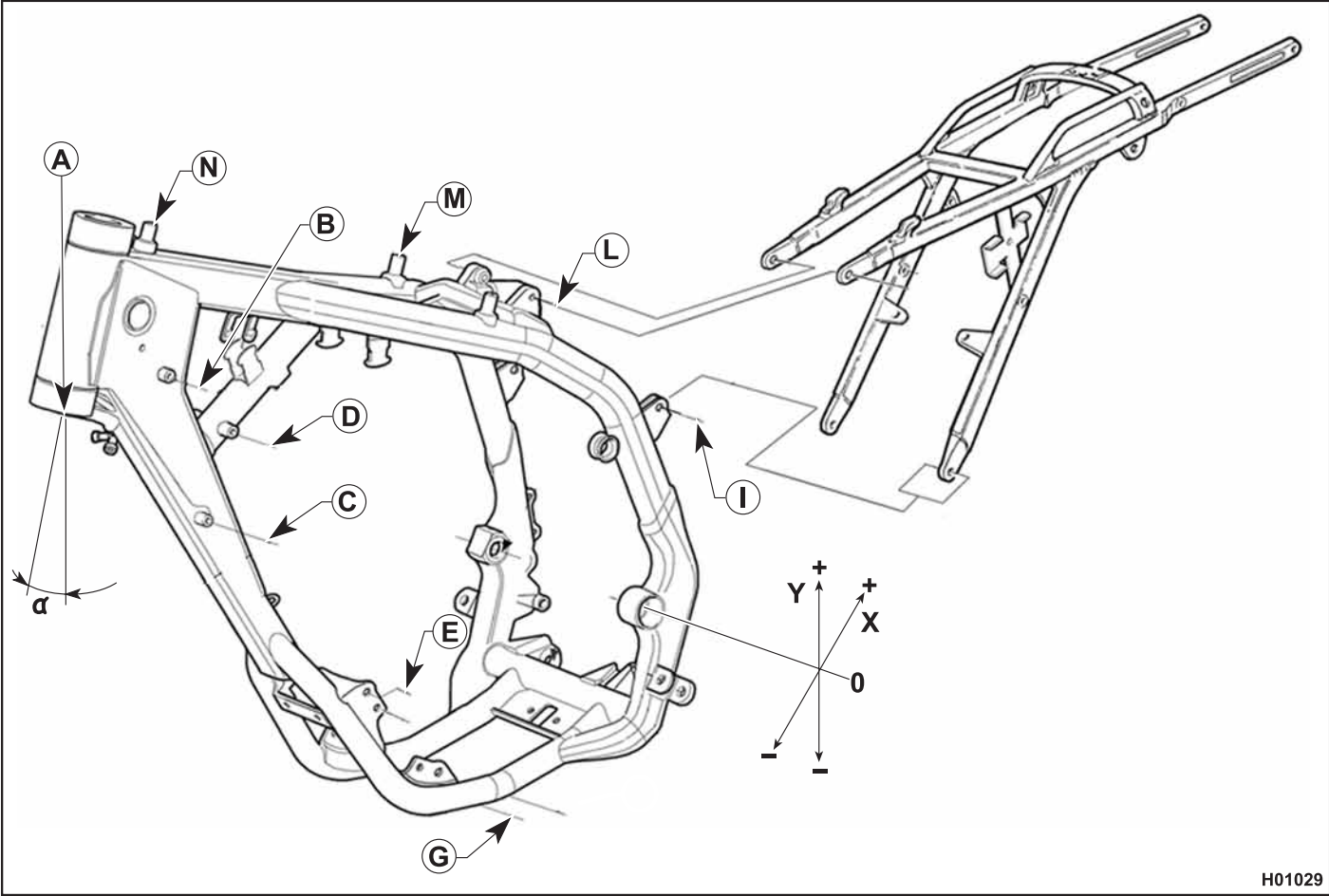


Chassis

The single frame branches off at the exhaust and is made of steel tubes with circular, rectangular and ellipsoidal section; the rear chassis is made from light alloy. Refer to the figure for a quick inspection. Use the dimensions reported below to determine whether the chassis needs realigning or replacing.



A badly damaged chassis must be replaced.



H01029

STANDARD mm (in.)

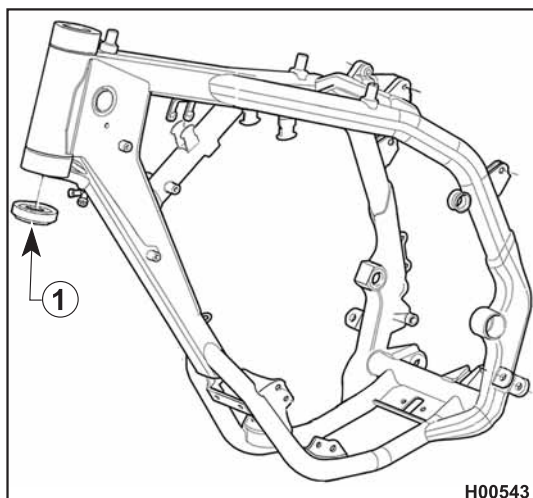
AXIS	"X"	"Y"	"X"	"Y"
A	-576.7 (22.7)	+440.5 (17.34)	-555.2	440.5
B	-460 (18.11)	+423 (16.65)	-425	435.5
C	-442 (17.40)	+259 (10.19)	-425	270
D	-394.2 (15.52)	+337.2 (13.27)	-369	342.5
E	-311 (12.24)	+23.2 (0.91)	-274.8	4.9
G	-262.5 (10.33)	-81.5 (3.2)	-200	-148.6
I	+65.5 (2.57)	+170 (6.69)	65	200
L	-20 (0.78)	+335.4 (13.20)	-14	335.4
M	-84.8 (3.33)	+374 (14.72)	-94.5	373
N	-430.1 (16.93)	+576.1 (22.68)	390	584.1

Rake α	26°
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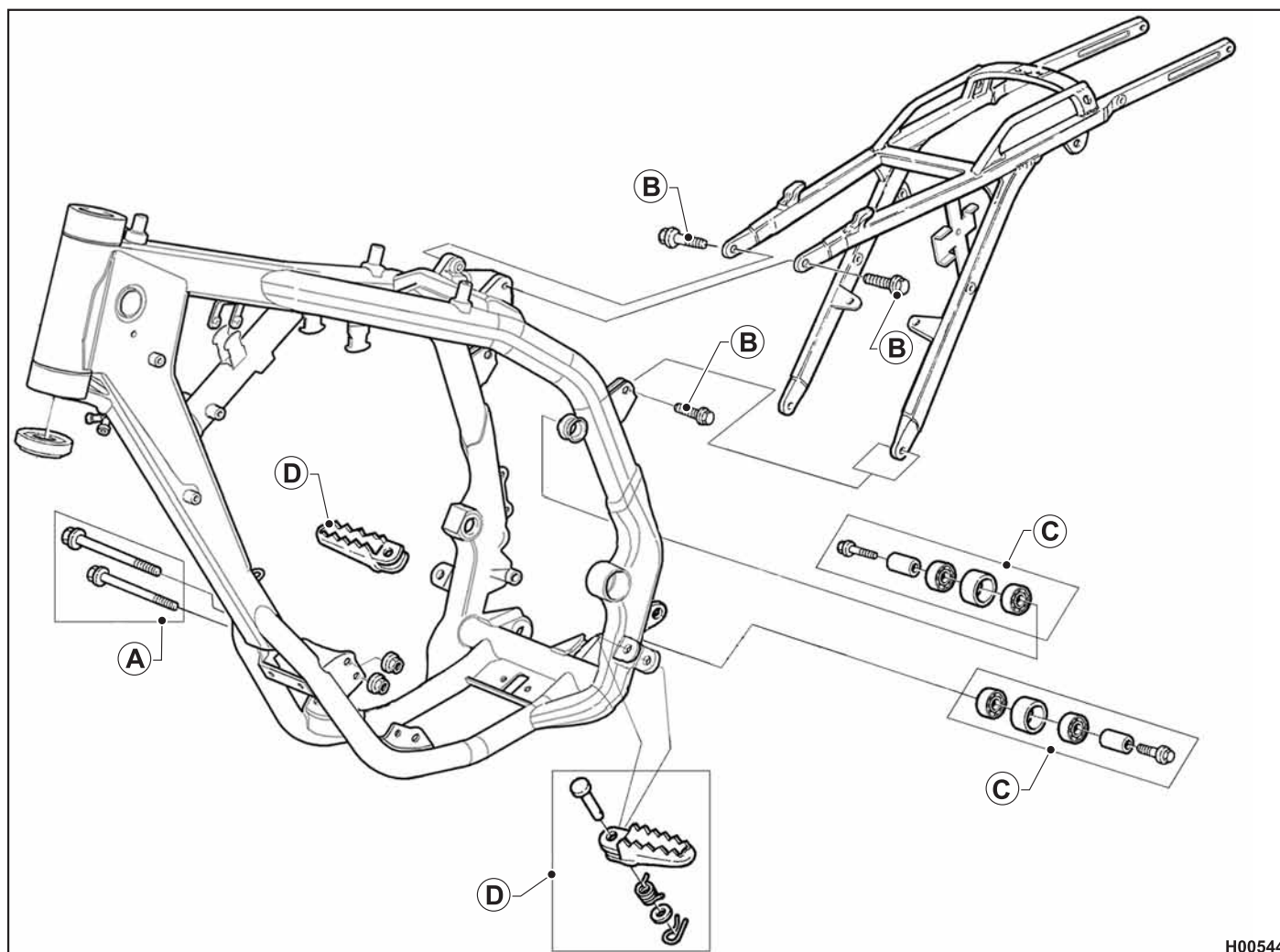
CHASSIS AND WHEELS



Lubrication points (lubricant)

- 1 Steering bearings (grease)

H00543



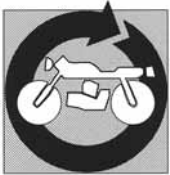
H00544

Check the assemblies shown in the figure for cracks or damage.

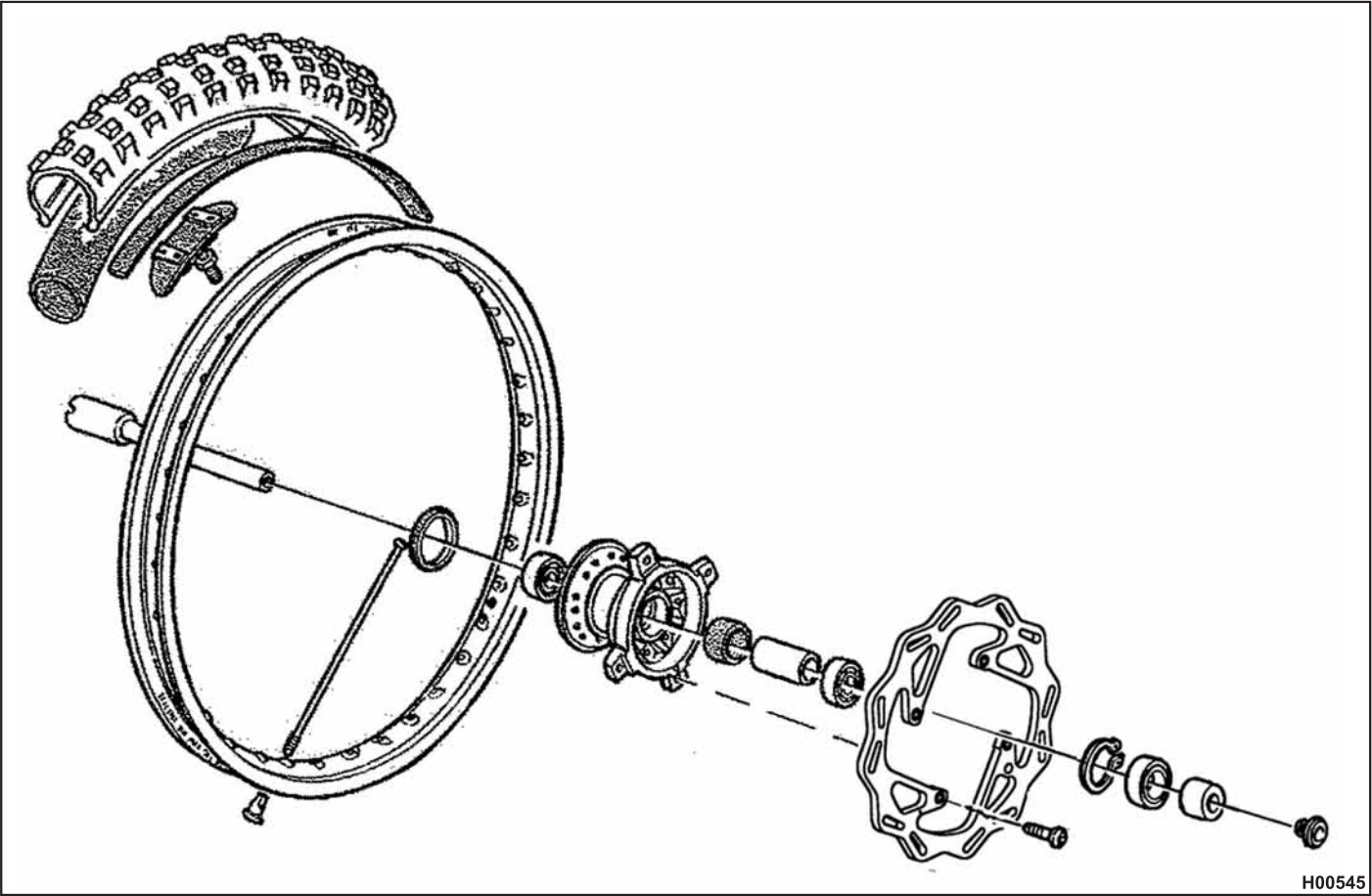
If any are found, replace the part.

- A ENGINE MOUNTING BOLTS
- B REAR CHASSIS MOUNTING BOLTS
- C CHAIN GUIDE ROLLER/BEARING
- D FOOTPEGS/PINS/SPRINGS





Front wheel



Light alloy wheel hub and rim with high-strength steel spokes.

Make, type and size of wheel rims "TAKASAGO" Excel, light alloy:
1.6x21"

(TC)
Make, type and size of tyre..... "Pirelli" 51R-MT 32A or
Dunlop D756;
80/100 x 21"

(TE - TXC)
Make, type and size of tyre..... "Michelin" Enduro Comp. 3 or
"Pirelli" MT83 Scorpion;
90/90 x 21"

(TE USA)
Make, type and size of tyre..... Metzeller Karoo
90/90 x 21

Cold tyre pressure
(TC) 0.9-1.0 Kg/sq cm
(TE - TXC) (racing) 0.9-1.0 Kg/sq cm
(TE) (road use) 1.1 Kg/sq cm



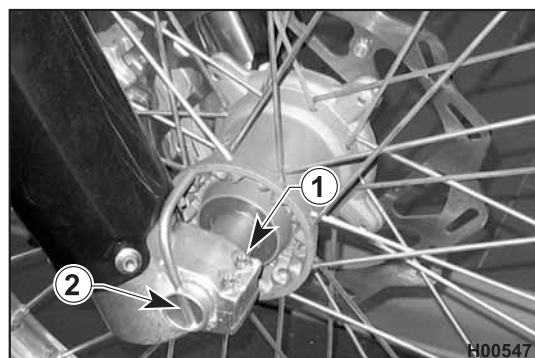


CHASSIS AND WHEELS

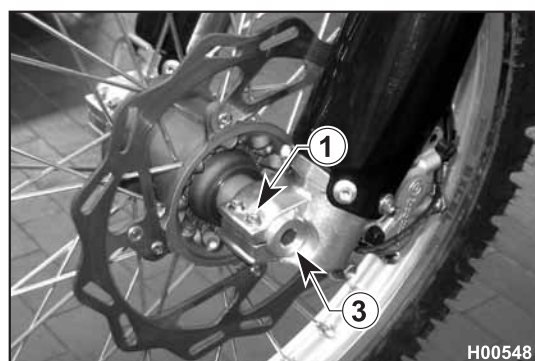


Removing the front wheel

Set a stand or a block under the engine and see that the front wheel is lifted from the ground.



Loosen the bolts (1) holding the wheel axle (2) to the front fork mounts.



Hold the head of the wheel axle in place, and unscrew the bolt (3) on the opposite side; draw the wheel axle out.



Do not operate the front brake lever when the wheel has been removed; this causes the calliper pistons to move outwards.

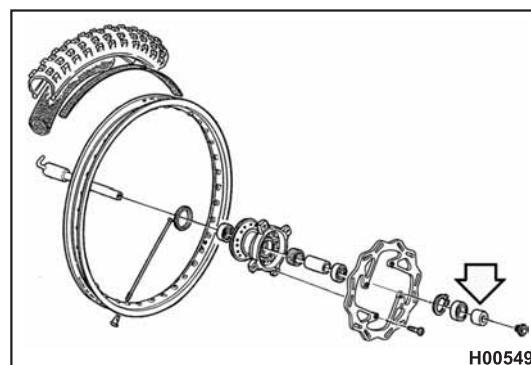


After removal, lay down the wheel with brake disc on top.



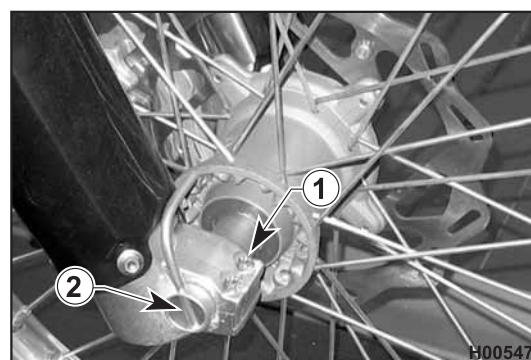
Reassembling the front wheel

Fit the L.H. spacer on the wheel hub.

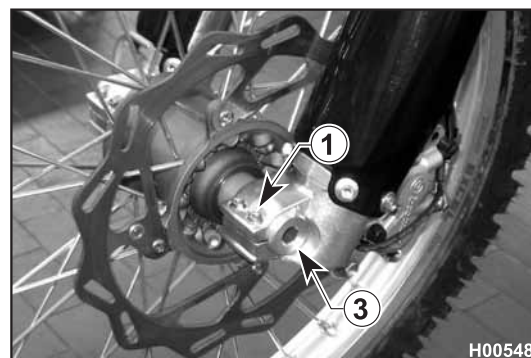


Fit the wheel between the fork legs so as to set the brake disc into the calliper.

Fit the wheel axle (2) from the R.H. side, after greasing it and push it fully home against the L.H. fork leg; during this operation, the wheel should be turned.



Tighten the screw (3) on the fork L.H. side but DO NOT lock it. Now, pump for a while, pushing the handlebar downwards until you are sure that the fork legs are perfectly aligned. Lock: the screws (1) on the R.H. leg (10.4 Nm, 1.05 Kgm, 7.7 ft/lb), the screw (3) on the L.H. side (51.45 Nm, 5.25 Kgm, 38 ft/lb), the screws (1) on the L.H. leg (10.4 Nm, 1.05 Kgm, 7.7 ft-lb).



After reassembly, pull the brake control lever until the pads are against the brake disc.



This exploded view diagram illustrates the components of a motorcycle rear wheel assembly. The central element is the rear wheel, which includes a multi-spoke rim and a tire. To the left, the rear hub assembly is shown, featuring a central axle, a large gear, and various bearings and seals. To the right, the rear sprocket is depicted, along with its mounting hardware. Above the wheel, a section of the drive chain and a link are shown. Below the wheel, a segment of the drive chain and a link are also illustrated. The diagram uses dashed lines to indicate the assembly path and alignment of the components.

Cold tyre pressure	
(TC)	0.8-0.9 Kg/sq cm
(TE - TXC) (racing)	0.8-0.9 Kg/sq cm
(TE) (road use)	1.0 Kg/sq cm





Removing the rear wheel

Set a stand or a block under the engine and see that the rear wheel is lifted from the ground.



Unscrew the nut (1) of the wheel axle (3) and extract it. It is not necessary to loosen the chain tensioners (2); in this way, the chain tension will remain unchanged after reassembly. Extract the complete rear wheel, keeping the spacers located at the hub sides. To reassemble, reverse the above procedure remembering to insert the brake disc into the calliper.



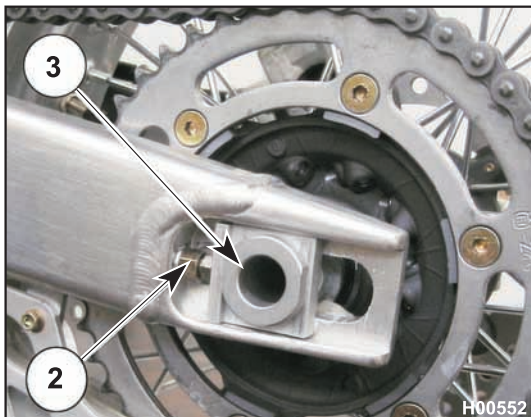
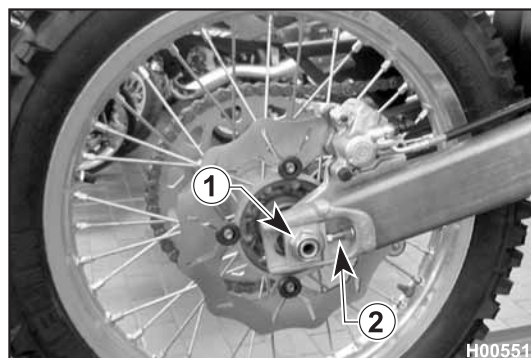
Do not operate the rear brake pedal when the wheel has been removed; this causes the calliper pistons to move outwards.



After removal, lay down the wheel with brake disc on top.



After reassembly, depress the brake pedal until the pads are against the brake disc.



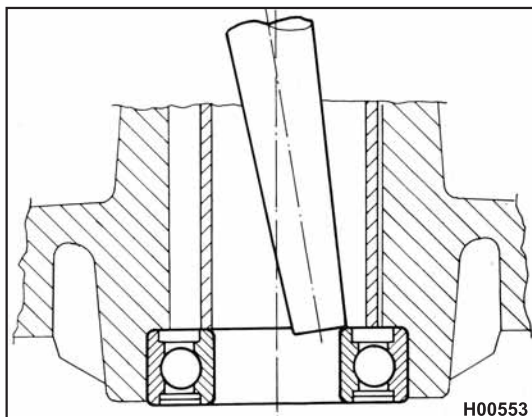
Tightening torque figures

1: 142.1 Nm, 14.5 Kgm, 104.8 ft/lb





CHASSIS AND WHEELS



Wheel servicing

Check the wheel hub bearings for wear. If you find too much (radial or axial) clearance, replace the bearings as follows:

- place the hub on a flat surface with an appropriate hole (for when you knock out the bearing);
- use a hammer and a punch to knock out the bearing; apply pressure only on the inner race of the bearing (see figure);
- tap at different positions so as to keep the bearing square in its seat;
- remove the spacer and use the same procedure for the other bearing.

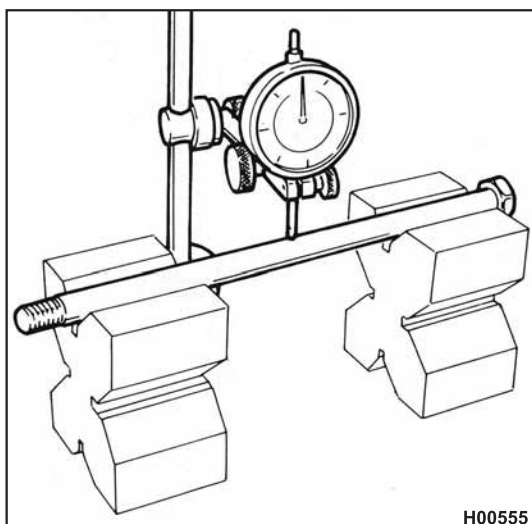
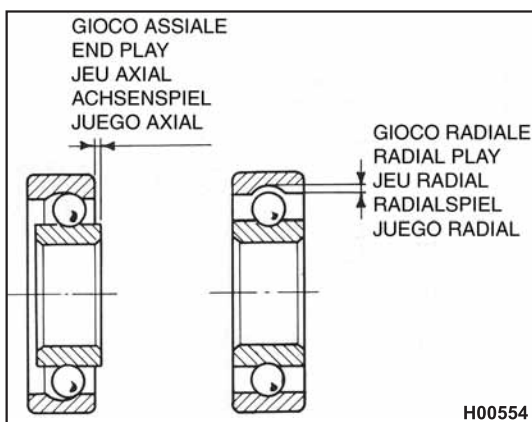


Discard the bearings after removal. Never reuse them.

Before installing the new bearings, check to ensure the seat is clean and shows no grooves or scratches. Lubricate the seat before installing the bearing. Drive the bearing into place using the special installer that only applies pressure to the outer race. Fit the spacer and the other bearing. Check for perfect alignment as you slide the axle into place.



Wheels should be balanced after each service.

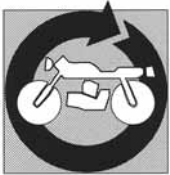


Wheel axle warpage

If warped beyond the maximum limit allowed, the axle must be straightened or replaced. Replace the axle if it cannot be straightened so as to meet the maximum limit allowed.

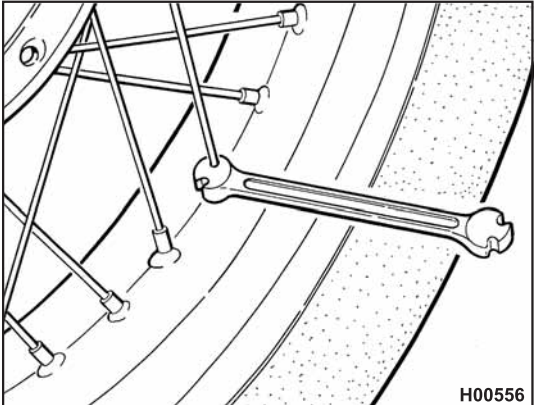
Axle runout over 100 mm

Wheel axle	Standard	Max limit
Wheel axle	less than 0.1 mm	0.2 mm (0.0078 in.)



Wheel spokes

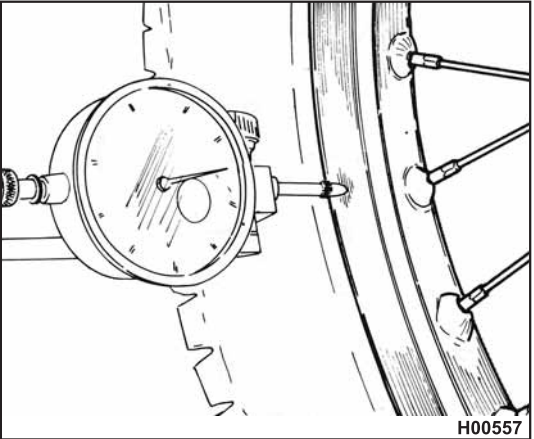
Make sure all nipples are firmly tightened (4.4 Nm, 0.45 Kgm, 3.2 ft/lb). Re-tighten if needed. Improper tightening will affect motorcycle stability; for a quick check, simply tap the spokes with the tip of a metal tool (such as a screwdriver): a clear, crisp sound indicates proper tightening, a dull sound means that the spokes need to be tightened.



H00556

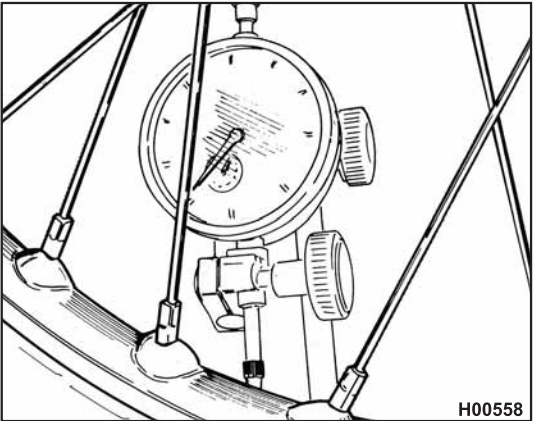
Wheel rim warpage

The table below reports the allowed limits for wheel rim warpage. Exceeding runout or out-of-round are generally due to worn bearings. When this is the case, replace the bearings. If this does not solve the problem, change the wheel rim or the wheel.



H00557

Standard		Max limit
Side runout	less than 0.5 mm	2 mm (0.078 in.)
Out-of-round	less than 0.8 mm	

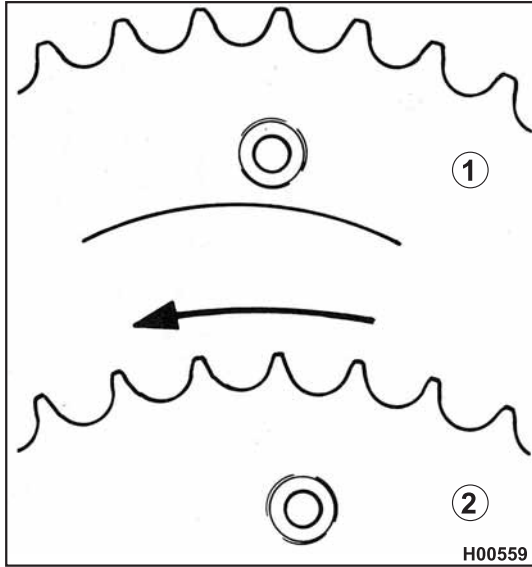


H00558





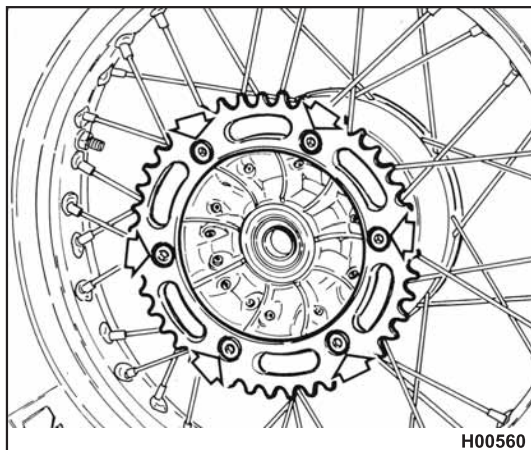
CHASSIS AND WHEELS



Rear chain sprocket, secondary drive sprocket and chain

The figure at the side shows the profiles of a normally worn and an exceedingly worn sprocket.

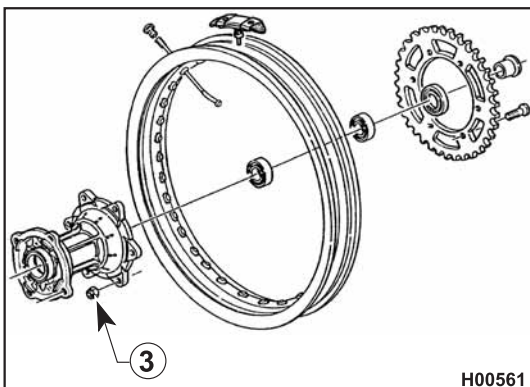
- 1 Normal wear
- 2 Exceeding wear



If the sprocket is exceedingly worn, replace it after loosening the six screws that retain it to the hub.



Chain and sprockets must always be replaced as a set.



Tightening torque figures

3: 34.3 Nm, 3.5 Kgm, 25.3 ft/lb + LOCTITE 243





Checking chain and sprockets for wear

Check chain wear as follows:

- turn the adjuster screws to stretch the chain taut;
- mark 20 chain links;
- measure distance "A" (centre distance between 1st and 21st link).

Check the transmission sprocket for damage or wear. When worn down like the sprocket shown in the figure, it must be replaced.



Wheel misalignment causes abnormal wear, making the motorcycle unsafe to ride.



Dirt caked on sprockets and chain collected while riding on muddy or wet terrain increases chain tension. If you expect to ride on muddy or wet terrain, slacken the chain a bit. Riding on muddy terrain significantly increases chain and sprocket wear.

