INTRODUCTION 0

SUMMARY

0.1. INTRODUCTION

0.1.1. FOREWORD

This manual provides the information required for normal servicing.
This publication is intended for use by **aprilia** Dealers and their qualified mechanics; many concepts have been omitted on purpose as their inclusion would be superfluous. Since complete mechanical explanations have not been included in this manual, the reader must be familiar with basic notions of mechanics, as well as with basic repair procedures. Without such familiarity, repairs and checks could be ineffective and even hazardous. Since the repair and vehicle check instructions are not exhaustive, special care must be taken to avoid damage and injury. **aprilia Piaggio & C. S.p.A.** undertakes to constantly improve the design of its products and the relevant literature to ensure maximum customer satisfaction. The main technical modifications and changes in repair procedures are communicated to all **aprilia** dealers and agencies worldwide. Such modifications will be entered in subsequent editions of the manual. Should you need assistance or clarifications about the inspection and repair procedures, please contact the **aprilia** SERVICE DEPT., they will be glad to give you any information on the matter, or supply you with any detail on updates and technical changes applied to the vehicle.

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0.1.2. REFERENCE MANUALS

OWNER'S MANUALS

aprilia part# (description)			
9100650	I	F	D
9100651	E	UK	
9100652	USA		

0.1.3. ABBREVIATIONS/SYMBOLS/CONVENTIONS

= number
< = less than
> = greater than
≤ = less than or equal to
≥ = more than or equal to
~ = approximately
∞ = infinity
°C = degrees Celsius (centigrade)
°F = degrees Fahrenheit
± = plus or minus
a.c = alternating current
A = Ampere
Ah = Ampere per hour
API = American Petroleum Institute
AT = high voltage
AV/DC = Anti-Vibration Double Countershaft
bar = pressure measurement unit (1 bar = 100 kPa)
d.c. = direct current
cc = cubic centimetres
CO = carbon monoxide
CPU = Central Processing Unit
DIN = German industrial standards (Deutsche Industrie Norm)
DOHC = Double Overhead Camshaft
ECU = Electronic Control Unit
rpm = revolutions per minute
HC = unburnt hydrocarbons
ISC = Idle Speed Control
ISO = International Standardisation Organisation
kg = kilograms
kgm = kilograms per metre (1 kgm = 10 Nm)
km = kilometres
km/h = kilometres per hour
kΩ = kilo Ohm
kPa = kiloPascal (1 kPa = 0.01 bar)
KS = clutch side (from the German "Kupplungsseite")
kW = kilowatt
ℓ = litres
LAP = racetrack lap
LED = Light Emitting Diode
LEFT SIDE = left side
m/s = metres per second
max = maximum
mbar = millibar (1 mbar = 0.1 kPa)
mi = miles
MIN = minimum
MPH = miles per hour
MS = flywheel side (from the German "Magnetoseite")
MΩ = MegaOhm
N.A. = Not Available
N.O.M.M. = Motor Octane Number
N.O.R.M. = Research Octane Number
Nm = Newton metre (1 Nm = 0.1 kgm)
Ω = ohm
PICK-UP = pick-up
BDC = Bottom Dead Centre
TDC = Top Dead Centre
PPC = Pneumatic Power Clutch

RIGHT SIDE = right side
SAE = Society of Automotive Engineers
TEST = diagnostic check
T.B.E.I. = crown-head Allen screw
T.C.E.I. = cheese-head Allen screw
T.E. = hexagonal head
T.P. = flat head screw
TSI = Twin Spark Ignition
UPSIDE-DOWN = inverted fork
V = volt
W = watt
Ø = diameter

GENERAL INFORMATION 1

SUMMARY

1.1. STRUCTURE OF THE MANUAL

1.1.1. CONVENTIONS USED IN THE MANUAL

- This manual is divided in sections and subsections, each covering a set of the most significant components. Refer to the index of sections when consulting the manual.
- Unless expressly specified otherwise, assemblies are reassembled by reversing the dismantling procedure.
- The terms "right" and "left" are referred to the rider seated on the vehicle in the normal riding position.
- Motorcycle operation and basic maintenance are covered in the "OWNER'S MANUAL".

In this manual any variants are identified with these symbols:

OPT	optional
✿	catalytic version
-	all versions
MP	national certification
SF	European certification (EURO 2 limits)

VERSION:

I	Italy	GR	Greece	MAL	Malaysia
UK	United Kingdom	NL	Holland	RCH	Chile
A	Austria	CH	Switzerland	HR	Croatia
P	Portugal	DK	Denmark	AUS	Australia
SF	Finland	J	Japan	USA	United States of America
B	Belgium	SGP	Singapore	BR	Brazil
D	Germany	SLO	Slovenia	RSA	South Africa
F	France	IL	Israel	NZ	New Zealand
E	Spain	ROK	South Korea	CDN	Canada

1.1.2. SAFETY WARNINGS

The following precautionary warnings are used throughout this manual in order to convey the following messages:

Safety warning. This symbol appears, whether in the manual or on the vehicle itself, to indicate a personal injury hazard. Non-compliance with the indications given in the messages preceded by this symbol may result in grave risks for your and other people's safety and for the vehicle!

DANGER
Indicates a potential hazard which may result in serious injury or even death.

WARNING
Indicates a potential hazard which may result in minor personal injury or damage to the vehicle.

NOTE *The word "NOTE" in this manual precedes important information or instructions.*

1.2. GENERAL RULES

1.2.1. BASIC SAFETY RULES

CARBON MONOXIDE
Should it be necessary to perform some operations with the vehicle running, make sure to work outdoors or in a well-aerated room.
Avoid starting the engine indoors.
In case you are working indoors, use a gas exhaust system.

DANGER
Exhaust gases contain carbon monoxide, which is extremely toxic if inhaled and may cause loss of consciousness or even lead to death.

FUEL

DANGER
The fuel used to operate engines is highly flammable and becomes explosive under particular conditions.
Refuelling and engine service should take place in a well-ventilated area with the engine stopped. Do not smoke when refuelling or in the proximity of sources of fuel vapours, avoid flames, sparks and any element that could ignite fuel or provoke explosions.

DO NOT DISPOSE OF FUEL IN THE ENVIRONMENT.

KEEP AWAY FROM CHILDREN.

HIGH-TEMPERATURE COMPONENTS
The engine and the components of the exhaust system become very hot and remain hot for some time after the engine has been stopped.
Before handling these components, wear insulating gloves or wait until the engine and the exhaust system have cooled down.

USED GEARBOX AND FORK FLUIDS

DANGER
Wear latex gloves when servicing.
Gearbox fluid may cause serious damage to the skin if handled daily and for long periods.
Wash your hands carefully after use.
Take it to the filling station where you usually buy it or to an oil salvage centre.
Wear latex gloves when servicing.

DO NOT DISPOSE OF FLUID IN THE ENVIRONMENT

KEEP AWAY FROM CHILDREN.

BRAKE FLUID

WARNING
When handling the brake fluid, take care not to spill it on the plastic, rubber or painted parts, since it can damage them. When carrying out the maintenance operations on the braking system, use a clean cloth to cover these parts.
Always wear safety goggles when working on the braking system.
The brake fluid is highly irritant. Avoid contact with your eyes.
If the brake fluid gets in contact with your eyes, carefully wash them with fresh water and immediately seek medical advice.

KEEP AWAY FROM CHILDREN.

COOLANT

Coolant contains ethylene glycol that is flammable, under certain conditions. When ignited, ethylene glycol produces invisible flames that might cause burns.

DANGER
Take care not to spill coolant onto hot engine parts and exhaust system. It may ignite and produce invisible flames.
Wear latex gloves when servicing.
Although toxic, it has a sweet taste that might attract animals. Never leave coolant in open container or in a position easily reachable by animals.

KEEP AWAY FROM CHILDREN.

Do not remove radiator cap when engine is still hot. Coolant is under pressure and might cause burns.

HYDROGEN GAS AND BATTERY ELECTROLYTE

DANGER
The battery electrolyte is a toxic, caustic substance containing sulphuric acid and thus able to cause severe burns in case of contact with the skin.
Always wear tight gloves and protective clothes when handling this fluid.
In case of contact with skin, rinse with plenty of fresh water.
Always use a protection for your eyes since even a very small amount of the battery fluid can cause blindness. In the event of contact with your eyes, carefully wash them with water for fifteen minutes and then consult immediately an eye specialist.
Should you accidentally drink some fluid, drink abundant water or milk, then drink magnesia milk or vegetable oil and immediately seek medical advice.
The battery gives off explosive gases and must be kept away from flames and sources of ignition or heat; do not smoke near the battery.

KEEP AWAY FROM CHILDREN.

Battery fluid is corrosive.
Do not spill it, especially on plastic parts.
Make sure that the electrolyte acid is suitable for the type of battery used.

GENERAL PRECAUTIONS AND INFORMATION

Follow these instructions closely when repairing, disassembling or reassembling the motorcycle or its components.

DANGER
Using bare flames is strictly forbidden when working on the motorcycle. Before servicing or inspecting the motorcycle: stop the engine and remove the key from the ignition switch; allow for the engine and exhaust system to cool down; where possible, lift the motorcycle using adequate equipment placed on firm and level ground. Be careful of any parts of the engine or exhaust system which may still be hot to the touch to avoid scalds or burns.
Do not put any vehicle parts into your mouth: vehicle components are not edible and some of them are harmful or even toxic.
Unless expressly specified otherwise, assemblies are reassembled by reversing the dismantling procedure. Where a procedure is cross-referred to relevant sections in the manual, proceed sensibly to avoid disturbing any parts unless strictly necessary. Do not polish matt-painted surfaces with polishing paste.
Never use fuel instead of solvent to clean the motorcycle.
Do not clean any rubber or plastic parts or the seat with alcohol, petrol or solvents. Clean with water and mild detergent.
Always disconnect the battery negative (-) lead before soldering any electrical components.
When two or more persons service the same motorcycle together, special care must be taken to avoid personal injury.

BEFORE DISASSEMBLING ANY COMPONENTS

- Clean off all dirt, mud, and dust and clear any foreign objects from the vehicle before disassembling any components.
- Use the model-specific special tools where specified.

DISASSEMBLING THE COMPONENTS

- Never use pliers or similar tools to slacken and/or tighten nuts and bolts. Always use the suitable spanner.
- Mark all connections (hoses, wiring, etc.) with their positions before disconnecting them. Identify each connection using a distinctive symbol or convention.
- Mark each part clearly to avoid confusion when refitting.
- Thoroughly clean and wash any components you have removed using a detergent with low flash point.
- Mated parts should always be refitted together. These parts will have seated themselves against one another in service as a result of normal wear and tear and should never be mixed up with other similar parts on refitting.
- Certain components are matched-pair parts and should always be replaced as a set.
- Keep away from heat sources.

REASSEMBLING THE COMPONENTS

DANGER
Never reuse a circlip or snap ring. These parts must always be renewed once they have been disturbed.
When fitting a new circlip or snap ring, take care to move the open ends apart just enough to allow fitment to the shaft.
Make it a rule to check that a newly-fitted circlip or snap ring has located fully into its groove.
Never clean a bearing with compressed air.

NOTE *All bearings must rotate freely with no hard spots or noise. Replace any bearings that do not meet these requirements.*

- Use ORIGINAL **aprilia** SPARE PARTS only.
- Use the specified lubricants and consumables.
- Where possible, lubricate a part before assembly.
- When tightening nuts and bolts, start with the largest or innermost nut/bolt and observe a cross pattern. Tighten evenly, in subsequent steps until achieving the specified torque.
- Replace any self-locking nuts, gaskets, seals, circlips or snap rings, O-rings, split pins, bolts and screws which have a damaged thread.
- Lubricate the bearings abundantly before assembly.
- Make it a rule to check that all components you have fitted are correctly in place.
- After repairing the motorcycle and after each service inspection, perform the preliminary checks, and then ride the motorcycle in a private estate area or in a safe area away from traffic.
- Clean all mating surfaces, oil seal edges and gaskets before assembly. Apply a thin layer of lithium grease along the edges of oil seals. Fit oil seals and bearings with the marking or serial number facing outwards (in view).

ELECTRICAL CONNECTORS

To disconnect the electrical connectors, follow the procedures below. Failure to comply with these procedures may lead to irreparable damage to the connector and the wiring as well.
If present, press the special safety hooks.

WARNING
Do not pull cables to disconnect the two connectors.

- Grasp the two connectors and disconnect them by pulling them in the two opposite directions.
- In case of dirt, rust, moisture, etc., thoroughly clean the inside of the connectors with compressed air.
- Make sure that the cables are correctly fitted inside the connector terminals.

NOTE *The two connectors have just one correct positioning. Make sure to position them in the right direction.*

- Then fit the two connectors. Make sure they are correctly coupled (a click will be heard if hooks are present).

TIGHTENING TORQUE SETTINGS

DANGER
Always remember that the tightening torque settings of all wheel, brake, wheel shaft and other suspension parts play a fundamental role to ensure vehicle safety. Make sure that these values are always within the specified limits.
Check fastening parts tightening torque settings at regular intervals. Upon reassembly, always use a torque wrench.
Failure to comply with these recommendations could lead to the loosening and detachment of one of these parts with a consequent locking of the wheel or other serious troubles affecting the vehicle manoeuvrability, and thus the risk of falls and serious injuries or death.

1.3. DANGEROUS ELEMENTS

1.3.1. WARNINGS

FUEL

DANGER
The fuel used to operate engines is highly flammable and becomes explosive under particular conditions.
Refuelling and engine service should take place in a well-ventilated area with the engine stopped.
Do not smoke when refuelling or in the proximity of sources of fuel vapours, avoid flames, sparks and any element that could ignite fuel or provoke explosions.
Take care not to spill fuel out of the filler, or it may ignite when in contact with hot engine parts.
In the event of accidental fuel spillage, make sure the affected area is fully dry before starting the engine. Fuel expands from heat and when left under direct sunlight.
Never fill the fuel tank up to the brim. Tighten the filler cap securely after each refuelling.
Avoid contact with skin. Do not inhale vapours. Do not swallow fuel. Do not transfer fuel between different containers using a hose.
DO NOT DISPOSE OF FUEL IN THE ENVIRONMENT.
KEEP AWAY FROM CHILDREN.

Use only premium grade unleaded petrol, min. O.N. 95 (RON) and 85 (MON).

LUBRICANTS

DANGER
A good lubrication ensures the vehicle safety.
Failure to keep the lubricants at the recommended level or the use of a non-suitable new and clean type of lubricant can lead to the engine or gearbox seizure, thus causing serious accidents, personal injury or even death.
Gear fluid may cause serious damage to the skin if handled daily and for long periods.
Wash your hands carefully after use.
Do not dispose of oil in the environment.
Take it to the filling station where you usually buy it or to an oil salvage centre.

WARNING
When filling the vehicle with this oil, take care not to spill it out. Immediately clean spilt oil, or it might damage the vehicle paintwork.
In case of contact with oil, the tyres surface will become very slippery, thus becoming a serious danger for your safety.
In case of leaks, do not use the vehicle. Check and trace the cause of leaks and proceed to repair.

ENGINE OIL

DANGER
Engine oil may cause serious damage to the skin if handled daily and for long periods.
Wash your hands carefully after use.
Do not dispose of oil in the environment.
Dispose of gearbox fluid through the nearest waste oil reclamation firm or through the supplier.
Wear latex gloves when servicing.

FRONT FORK FLUID

DANGER
Front suspension response can be modified to a certain extent by changing damping settings and/or selecting a particular grade of oil. Standard oil viscosity: SAE 20 W. Different oil grades can be selected to obtain a particular suspension response (choose SAE 5W for a softer suspension, 20W for a stiffer suspension).
The two grades can also be mixed in varying solutions to obtain the desired response.

BRAKE FLUID

NOTE *This vehicle is fitted with front and rear disc brakes. Each braking system is operated by an independent hydraulic circuit. The information provided below applies to both braking systems.*

DANGER
Do not use the vehicle in case brakes are worn out or do not work properly. The brakes are the parts that most ensure your safety and for this reason they must always be perfectly working. Failure to comply with these recommendations will probably lead to a crash or an accident, with a consequent risk of personal injury or death.
A wet surface reduces brakes efficiency.

DANGER
In case of wet ground the braking distance will be doubled, since both brakes and tyre grip on the road surface are extremely reduced by the water present on the road surface.
Any water on brakes, after washing the vehicle or driving on a wet road surface or crossing puddles or gips, can wet brakes so as to greatly reduce their efficiency.
Failure to comply with these recommendations may lead to serious accidents, with a consequent risk of severe personal injuries or death.
Brakes are critical safety components. Do not ride the vehicle in case brakes are not working at their best.
Check for brakes proper operation before every trip.
Brake fluid is an irritant. Avoid contact with eyes or skin.
In the event of accidental contact, wash affected body parts thoroughly. In the event of accidental contact with eyes, contact an eye specialist or seek medical advice.
DO NOT RELEASE BRAKE FLUID INTO THE ENVIRONMENT.
KEEP AWAY FROM CHILDREN.
When handling brake fluid, take care not to spill it onto plastic or paint-finished parts or they will damage.

DANGER
Do not use any brake fluids other than the specified type. Never mix different types of fluids to top up level, as this will damage the braking system.
Do not use brake fluid from containers which have been kept open or in storage for long periods.
Any sudden changes in play or hardness in the brake levers are warning signs of problems with the hydraulic circuits.
Ensure that the brake discs and brake linings have not become contaminated with oil or grease. This is particularly important after servicing or inspections.
Make sure the brake lines are not twisted or worn.
Prevent accidental entering of water or dust into the circuit.
Wear latex gloves when servicing the hydraulic circuit.

DISC BRAKES

DANGER
The brakes are the parts that most ensure your safety and for this reason they must always be perfectly working; check them before every trip.
A dirty disc soils the pads.
Dirty pads must be replaced, while dirty discs must be cleaned with a high-quality degreaser.
Perform the maintenance operations with half the indicated frequency if the vehicle is used in rainy or dusty areas, on uneven surfaces or for racing.
Check brake pads for wear.
When the brake pads wear out, the level of the fluid decreases to automatically compensate for their wear.
The front brake fluid reservoir is located on the right handlebar, near the front brake lever.
The rear brake fluid reservoir is located under the right fairing.
Do not use the vehicle if the braking system leaks fluid.

COOLANT

DANGER
Coolant is toxic when ingested, contact with eyes or skin may cause irritation.
In the event of contact with your skin or eyes, rinse repeatedly with abundant water and seek medical advice. In the event of ingestion, induce vomiting, rinse mouth and throat with abundant water and seek medical advice immediately.
DO NOT RELEASE INTO THE ENVIRONMENT.
KEEP AWAY FROM CHILDREN.

DANGER
Take care not to spill coolant onto hot engine parts. It may ignite and produce invisible flames. Wear latex gloves when servicing. Do not ride when coolant is below the minimum level.

Coolant mixture is a 50% solution of water and antifreeze. This is the ideal solution for most operating temperatures and provides good corrosion protection.
This solution is also suited to the warm season, as it is less prone to evaporative loss and will reduce the need for top-ups.
In addition, less water evaporation means fewer minerals salts depositing in the radiator, which helps preserve the efficiency of the cooling system.
When the temperature drops below zero degrees centigrade, check the cooling system frequently and add more antifreeze (up to 60% maximum) to the solution, if needed.
Use distilled water in the coolant mixture. Tap water will damage the engine.
Refer to the chart given below and add water with the quantity of antifreeze to obtain a solution with the desired freezing point:

Freezing point °C	Coolant % of volume
-20°	35
-30°	45
-40°	55

NOTE *Coolants have different specifications. The protection degree is written on the label.*

WARNING
Use nitrite-free coolant only, with a protection until at least -35°C.

DRIVE CHAIN

Check drive chain operation, wear, slack and lubrication at regular intervals.
The vehicle is equipped with an endless chain with a joint link.

WARNING
If too slack, the chain can come off the front or rear sprockets thus leading to serious accidents and damage to the vehicle, with consequent serious personal injury or death.
Do not use the vehicle if the chain slack has not been correctly adjusted.
To check the chain, take it with your hand where it turns on the rear sprocket and pull it as to separate it from the sprocket itself.
If you can move the chain apart of the front sprocket for more than 3 mm (0.125 in), change chain, front and rear sprocket.

DANGER
If not properly maintained, chain can early wear out and lead to the damage of both front and rear sprockets.
Perform chain maintenance operations more frequently if the vehicle is used on dusty or muddy areas.

TYRES

WARNING
If tyres are excessively inflated, the vehicle will be hard, difficult and uncomfortable to ride.
In addition, the roadworthiness, mainly on wet surfaces and during cornering, will be impaired.
Flat tyres (insufficient pressure) can slip on the rim and make you lose the control of the vehicle.
In this case too, both vehicle roadworthiness, manoeuvrability and brake efficiency will be impaired.
Tyres changing, repair, maintenance and balancing must be carried out by specialised technicians using suitable equipment.
When new, tyres can have a thin slippery protective coating. Drive carefully for the first kilometres (miles).
Never use rubber treating substances on tyres.
In particular, avoid contact with fluid fuels, leading to a rapid wear.
In case of contact with oil or fuel, do not clean but change the tyres.

DANGER
Some of the factory-assembled tyres of this vehicle are provided with wear indicators.
There are several kinds of wear indicators.
For more information on how to check the wear, contact your Dealer.
Visually check if the tyres are worn and in this case have them changed.
If a tyre deflates while driving, stop immediately.
Avoid hard brakings or moves and do not close throttles too abruptly.
Slowly close the throttle grip, move to the edge of the road and use the engine brake to slow down until coming to a halt.
Failure to comply with these recommendations may lead to accidents, with a consequent risk of personal injuries or death.
Do not install tyres with air tube on rims for tubeless tyres and vice versa.

1.4. RUNNING-IN

1.4.1. RUNNING-IN

Correct engine running-is essential to ensuring proper performance and durability.
If possible, drive on hilly roads and/or roads with many bends, so that the engine, the suspensions and the brakes undergo a more effective running-in. During running-in, change speed. In this way the components are first "loaded" and then "relieved" and the engine parts can thus cool down.
Even if it is important to stress the engine components during running-in, take care not to exceed.

Keep to the following indications:

- Do not open the throttle completely if the speed is low, both during and after running-in.

- for the first 3 hours of operation, never open throttles more than half their way and never go beyond 8000 rpm,
- for the following 12 hours never open throttles more than 75% of their travel.

NOTE *Even after running-in, avoid riding at such rpm as to have the rpm limiter trip, i.e.:*

- **SXV 450** 12000 rpm
- **SXV 550** 11500 rpm
- **RXV 450** 11500 rpm
- **RXV 550** 11000 rpm

WARNING
Limiter warning light (not the CPU limiter) is set in-house to 8000 rpm, see INSTRUMENT PANEL for its final setting.

TECHNICAL INFORMATION 2

SUMMARY

2.1. TECHNICAL INFORMATION

2.1.1. TECHNICAL DATA

ENGINE 450	
ENGINE	
Model (SXV 450)	45SX
Model (RXV 450)	45RX
Type	Twin-cylinder, 4-stroke with 4 valves, single overhead camshaft
Number of cylinders	2
Total displacement	449 cu. cm (27.40 cu in).
Bore/stroke	76 mm x 49.5 mm (2.99 in x 1.95 in)
Compression ratio	(13 ÷ 1)± 0.5
Idling speed	(1800 ÷2000) ± 100 rpm
Valve timing (SXV 450) Intake opens at Intake closes at Exhaust opens at Exhaust closes at	 18° BTDC 48° ABDC 49° BBDC 15° ATDC
Valve timing (RXV 450) Intake opens at Intake closes at Exhaust opens at Exhaust closes at	 18° BTDC 30° ABDC 31° BBDC 19° ATDC
Intake valve clearance	0.07 ÷ 0.12 mm (0.0027 ÷ 0.0047 in)
Exhaust valve clearance	0.17 ÷ 0.22 mm (0.0067 ÷ 0.0087 in)
Ignition	Digital, electronic
Starting	Electric starter
Spark advance	Variable, controlled by CDI
Air filter	With dry filter cartridge
Clutch	
Type	Multiplate, wet clutch with control on the left side of the handlebar
Driving plates 1	# plates: 2
	Thickness: 1.5 mm (0.059 in)
Driving plates 2	# plates: 5
	Thickness: 2 mm (0.079 in)
Clutch plates	# plates: 8
	Thickness: 2.75 mm (0.108 in)
Clutch springs	Uncompressed length: xxxx mm (xxx in)
	# springs: 6
Lubricating system	
Type	Gearbox splash lubrication with special fluid; engine forced lubrication with scavenge pump and external reservoir
Oil filter	Paper type
Engine oil quantity	After overhaul, 1400 cu.cm (0.37 gal) (0.31 UKgal)
	Periodic oil change: 1300 cu.cm (0.34 gal) (0.28 UKgal)
Cooling system	
Type	Liquid
Water pump	Centrifugal pump with single intake
	Reduction ratio: 44/22

SXV450 TRANSMISSION				
Gear ratios				
Ratio	Primary	Secondary	Final ratio	Total ratio
1st	22/56 = 1: 2.545	12/30 = 1: 2.307	15/48 = 1: 3.067	1 : 18.013
2nd		15/27 = 1: 1.800		1 : 14.050
3rd		16/23 = 1: 1.437		1 : 11.221
4th		20/23 = 1: 1.150		1 : 8.897
5th		21/21 = 1: 1.000		1 : 7.806
RXV450 TRANSMISSION				
Gear ratios				
Ratio	Primary	Secondary	Final ratio	Total ratio
1st	22/56 = 1: 2.545	12/31 = 1: 2.583	15/48 = 1: 3.200	1 : 21.042
2nd		13/25 = 1: 1.923		1 : 15.664
3rd		15/23 = 1: 1.533		1 : 12.489
4th		19/24 = 1: 1.263		1 : 10.288
5th		21/22 = 1: 1.047		1 : 8.533

FUEL SYSTEM	
Type	Electronic injection
Throttle	Ø 38 mm (1.49 in)
FUEL	
Fuel	Premium-grade unleaded petrol, minimum octane rating 95 (RON) and 85 (MON), as per DIN 51 607.
SPARK PLUGS	
Standard	NGK CR8EB
Spark plug electrode gap	0.7 – 0.8 mm (0.028 – 0.031 in.)
Resistance	5 KΩ
ELECTRIC SYSTEM	
Generator (with permanent magnet)	12 V – 350 W
Starter motor	12 V – 480 W

ENGINE 550

ENGINE	
Model (SXV 550)	55SX
Model (RXV 550)	55RX
Type	Twin-cylinder, 4-stroke with 4 valves, single overhead camshaft
Number of cylinders	2
Total displacement	553 cu. cm (33.75 cu in).
Bore/stroke	80 mm x 55.0 mm (3.15 in x 2.16 in)
Compression ratio	(12.5 ÷ 1)± 0.5
Idling speed	(1800 ÷2000) ± 100 rpm
Valve timing (SXV 550) Intake opens at Intake closes at Exhaust opens at Exhaust closes at	 18° BTDC 48° ABDC 49° BBDC 15° ATDC
Valve timing (RXV 550) Intake opens at Intake closes at Exhaust opens at Exhaust closes at	 18° BTDC 30° ABDC 31° BBDC 19° ATDC
Intake valve clearance	0.07 ÷ 0.12 mm (0.0027 ÷ 0.0047 in)
Exhaust valve clearance	0.17 ÷ 0.22 mm (0.0067 ÷ 0.0087 in)
Ignition	Digital, electronic
Starting	Electric starter
Spark advance	Variable, controlled by CDI
Air filter	With dry filter cartridge

Clutch				
Type		Multiplate, wet clutch with control on the left side of the handlebar		
Driving plates 1		# plates: 2		
		Thickness: 1.5 mm (0.059 in)		
Driving plates 2		# plates: 5		
		Thickness: 2 mm (0.079 in)		
Clutch plates		# plates: 8		
		Thickness: 2.75 mm (0.108 in)		
Clutch springs		Uncompressed length: 46 mm (1.81 in)		
		# springs: 6		
Lubricating system				
Type		Gearbox splash lubrication with special fluid; engine forced lubrication with scavenge pump and external reservoir		
Oil filter		Paper type		
Engine oil quantity		After overhaul, 1400 cu.cm (0.37 gal) (0.31 UKgal)		
		Periodic oil change: 1300 cu.cm (0.34 gal) (0.28 UKgal)		
		After overhaul, 1400 cu.cm (0.37 gal) (0.31 UKgal)		
Cooling system				
Type		Liquid		
Water pump		Centrifugal pump with single intake		
		Reduction ratio: 44/22		
SXV550 TRANSMISSION				
Gear ratios				
Ratio	Primary	Secondary	Final ratio	Total ratio
1st	22/56 = 1: 2.545	12/30 = 1: 2.307	15/48 = 1: 2.875	1 : 16.888
2nd		15/27 = 1: 1.800		1 : 13.172
3rd		16/23 = 1: 1.437		1 : 10.519
4th		20/23 = 1: 1.150		1 : 8.415
5th		21/21 = 1: 1.000		1 : 7.318
RXV550 TRANSMISSION				
Gear ratios				
Ratio	Primary	Secondary	Final ratio	Total ratio
1st	22/56 = 1: 2.545	12/31 = 1: 2.583	15/48 = 1: 3.200	1 : 21.042
2nd		13/25 = 1: 1.923		1 : 15.664
3rd		15/23 = 1: 1.533		1 : 12.489
4th		19/24 = 1: 1.263		1 : 10.288
5th		21/22 = 1: 1.047		1 : 8.533
FUEL SYSTEM				
Type		Electronic injection		
Throttle		Ø 40 mm (1.57 in)		
FUEL				
Fuel		Premium-grade unleaded petrol, minimum octane rating 95 (RON) and 85 (MON), as per DIN 51 607.		
SPARK PLUGS				
Standard		NGK CR8EB		
Spark plug electrode gap		0.7 – 0.8 mm (0.028 – 0.031 in.)		
Resistance		5 KΩ		
ELECTRIC SYSTEM				
Generator (with permanent magnet)		12 V – 350 W		
Starter motor		12 V – 480 W		

2.1.2. LUBRICANT TABLE

ENGINE 450 - 550	
LUBRICANT	**PRODUCT**
Engine oil	RECOMMENDED Agip RACING 4T, SAE 10W – 60. As an alternative use top brand oils meeting or exceeding CCMC G-4, A.P.I. SG. SAE 10W-60 specifications.
Gearbox fluid	RECOMMENDED: Agip GEAR SINTH 75W – 90.
Coolant	RECOMMENDED: Agip ANTIFREEZE PLUS.
Brake fluid	RECOMMENDED: Agip BRAKE FLUID DOT 4 PLUS.
Bearings and other lubrication points	RECOMMENDED: Agip MP GREASE As an alternative to recommended grease, use top brand rolling bearing grease that will resist a temperature range of -30°C to +140°C (-22 °F to +284°F), with dripping point 150°C to 230 °C (302°F to 446°F), high corrosion protection, good resistance to water and oxidisation.
Forks	RECOMMENDED: Agip FORK 7.5W and Agip FORK 10W.

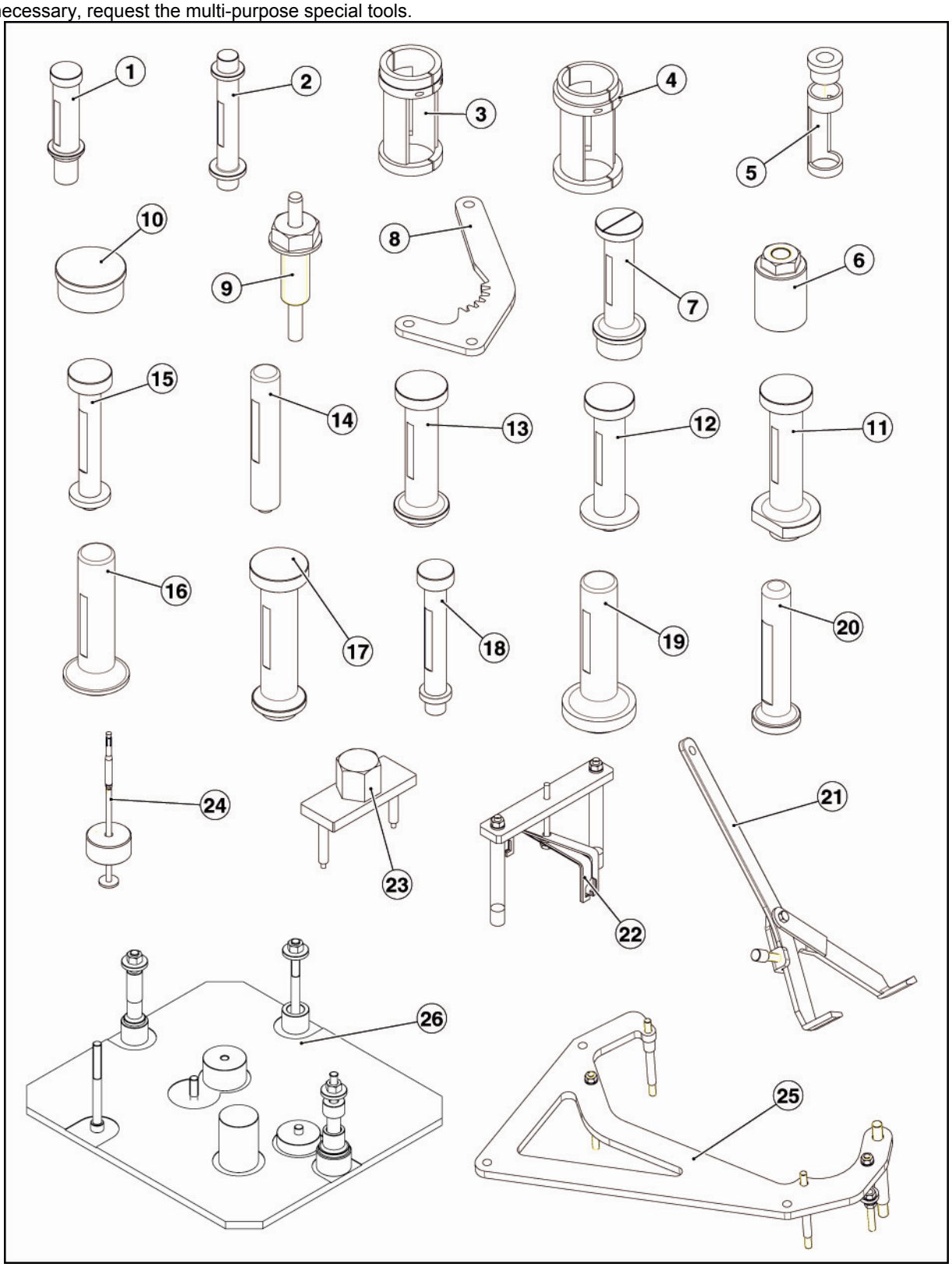
2.1.3. TIGHTENING TORQUE SETTINGS

DESCRIPTION	SCREW / NUT	TIGHTENING TORQUE SETTINGS Nm (Lbft)	NOTES
ENGINE			
Nut securing engine to frame	M10	54 (39.82)	
Screw securing throttle body to head	M6	12 (8.85)	loctite 243
Screw securing control unit to plate	M4	4.4 (3.24)	loctite 243
Screw securing voltage regulator and control unit to frame	M6	12 (8.85)	
Coil screw	M6	12 (8.85)	
Screw securing sprocket cover and chain guide plate	M6	12 (8.85)	
Engine oil drain cap	M12x1.5	18 (13.28)	
Gearbox fluid drain cap	M10X1.5	18 (13.28)	
Oil filter cover	M56x1.5	25 (18.44)	
Piston mounting hole plug	M30x2	30 (22.13)	
Spark plug	M10X1.25	12 (8.85)	
Gearbox fluid check screw	M6x1	9.8 (7.23)	
Water pump impeller	M7x1	12 (8.85)	
Head cover screw	M6x1	9.8 (7.23)	
Water pump cover screw	M6x1	9.8 (7.23)	
Clutch cover screw	M6x1	9.8 (7.23)	
Right casing cover screw	M6x1	9.8 (7.23)	
Casing jointing bolt	M6x1	12 (8.85)	
Casing jointing bolt	M7x1	15 (11.06)	
Ignition cover screw	M6x1	9.8 (7.23)	
Pick-up screw	M5x0.8	8 (5.90)	loctite 270
Stator fixing screw	M5x0.8	8 (5.90)	loctite 270
Chain tensioner sliding shoe screw	M6x1	9.8 (7.23)	loctite 270
Timing chain tensioner screw	M6x1	10 (7.37)	
Cable guide ring screw	M6x1	10 (7.37)	
Oil lines mounting plate screw	M6x1	9.8 (7.23)	loctite 270
Blow-by breather union	M12x1	18 (13.28)	Use sealant
Flywheel nut	M14x1	98 (72.28)	
Starter motor screw	M6x1	9.8 (7.23)	
Chain guide plate screw	M6x1	12 (8.85)	
Screw securing primary shaft bearing	M6x1	12 (8.85)	loctite 270
Screw securing lay shaft bearing	M6x1	12 (8.85)	loctite 270
Desmo bearing screw	M5x0.8	8 (5.90)	loctite 270
Gear indicator screw	M5x0.8	6 (4.43)	loctite 270
Gear change pedal screw	M6x1	12 (8.85)	
Head bolt (pre-torque)	M10X1.25	30 (22.13)	Smear screws and washers with oil
Head bolt	M10X1.25	50 (36.88)	
Head bolt	M6x1	12 (8.85)	
Timing gear nut	M12x1	50 (36.88)	
Timing cover screw	M5x0.8	6 (4.42)	loctite 243
Primary sprocket nut	M18x1.25	160 (118.00)	
Gear selector stop plate screw	M6x1	12 (8.85)	loctite 270
Oil collector plate screw	M6x1	12 (8.85)	loctite 270
Gear selector shaft stop screw	M10X1.25	25 (18.44)	loctite 270
Gear ratchet rotation screw	M6x1	12 (8.85)	loctite 243
Selector shaft	M8x1.25	22 (16.23)	loctite 270
Clutch hub nut	M18x1.25	75 (55.32)	
Clutch spring screw	M6x1	12 (8.85)	
Pressure reducing valve	M14x1.5	20 (14.75)	
Feed pump retaining screw	M6x1	9.8 (7.23)	
Scavenge pump retaining screw	M6x1	9.8 (7.23)	
Head lubricating nozzle	M7x1	2.5 (1.84)	
Valve lift block screw	M5x0.8	9 (6.64)	loctite 270
Water union plate screw	M5x0.8	9 (6.64)	

DESCRIPTION	SCREW / NUT	TIGHTENING TORQUE SETTINGS	NOTES
		Nm	
Crankshaft stop screw	M8x1.25	22 (16.23)	loctite 270
Freewheel outer ring screws	M6x1	13 (9.58)	loctite 270
Throttle body screws	M6x1	13 (9.58)	loctite 243
Camshaft gear retaining screw	M16x1	35 (25.82)	
Con-rod cap screw	M8x1	15+(48°÷50°) 11.06+(48°÷50°)	Molicote G-N Plus

2.1.4. SPECIAL TOOLS

In order to perform assembly, reassembly and settings correctly, special tools suitable for the task must be used.
The use of special tools avoids the potential risk of damage as a result of inappropriate tools and/or improvised methods.
Below is a list of the special tools designed especially for this specific vehicle.
If necessary, request the multi-purpose special tools.



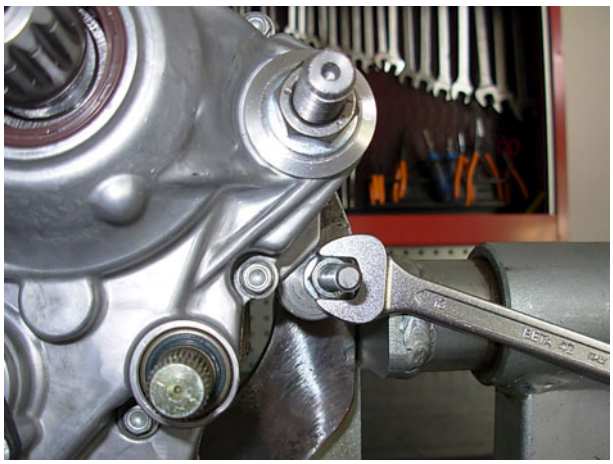
Pos.	Description	Part number
1	Swinging arm cages drift	9100898
2	Drift for swinging arm levers cages	9100900
3	Oil seal - Marzocchi fork d.45	9100903
4	Oil seal - Sachs fork d.48	9100904
5	Valve spring compression tool	9100838
6	Flywheel puller	9100839
7	Crankshaft bearings tool	9100840
8	Crankshaft sprocket locking tool	9100843
9	Crankshaft locking tool (timing pin)	9100844
10	Crankshaft bearings removal tool	9100884
11	Gearbox primary/rh – secondary/lh	9100885
12	Gearbox secondary/rh – primary/lh	9100886
13	Right casing desmo tool	9100887
14	Oil pump oil seal tool	9100888
15	Timing transm.crankshaft tool	9100889
16	Crankshaft oil seal tool	9100890
17	Lh casing Desmo + wheel hub	9100892
18	Lh timing transm. tool	9100893
19	Secondary shaft oil seal tool	9100894
20	Water pump oil seal tool	9100895
21	Clutch housing locking tool	9100896
22	Cylinder barrel extractor	9100897
23	Pump impeller tool	9100938
24	Piston gudgeon pin extractor	9100943
25	Engine support	9100841
26	Crankcase support	9100942

2.1.5. ASSEMBLING ENGINE TO PLATE

- Fit the engine support part no. 9100841 on the aprilia engine support stand.

- Assemble the engine on the support using the provided pin holes.

- Secure the engine by means of the proper check nuts.
- Make sure that retaining eccentric of clutch-side crankcase is properly fixed as it is used to open the two crankcase halves.



2.1.6. LIMIT VALUES

LIMIT VALUES CHART	
Description	**Limit value (mm)**
Max. head deformation	0.05
Maximum camshaft out of round	0.05
Rocker arm inner diameter	12.04
Rocker arm shaft outer diameter	11.96
Rocker arm-rocker arm shaft clearance	0.08
Valve wear limit	4.96
Valve-valve guide clearance (intake)	0.08
Valve-valve guide clearance (exhaust)	0.08
Thickness on seal side - intake valve	2.2
Thickness on seal side - exhaust valve	2.5
Valve stem out of round	0.01
Width of intake valve-seat mating surface	1.3
Width of exhaust valve-seat mating surface	1.5
Bucket diameter	25.96
Bucket seat diameter on head	26.04
Intake spring uncompressed length	37.8
Exhaust spring uncompressed length	35.7
Valve spring max. inclination	2.5° -1.8
Cylinder barrel inner diameter	76.02/80.02
Piston outer diameter	75.94/79.94
Piston pin bore inner diameter	16.02 / 17.02
First piston ring end clearance	0.45
Con-rod small end inner diameter	16.04 / 17.04
Clutch plates deformation	0.2
Clutch pack limit value	34
Clutch spring length	45.1