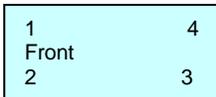


<b>LANCIA &amp; C.</b>  FABBRICA AUTOMOBILI TORINO - S.p.A. Printed in Italy	<b>LANCIA APRILIA 1<sup>st</sup> Series</b>  <b>Data &amp; Main Maintenance Instructions</b>	A.S.T. Sketch 60 I-PM  25.10.48 Sheet 1/6
Remade by Paul Mayo, 13/08/2009 with additional section of information from Lancia (England) Ltd & other sources		

\* - Data from other sources includes servicing sheets distributed by Lancia (England) Ltd in the 1940s & 1950's for Tipo 238 & 239 from April 1937 to February 1940; Oil Company servicing data; RIV bearing data.

Engine	Data from Lancia Sketch 60	Data from Other Sources*
Number of Cylinders	4	Car 38-6612 only fitted with special engine & 3.75:1 axle ratio
Bore	72 mm	2 3/4 "
Stroke	83 mm	3 17/64,,
Capacity	1352 cc	
Compression ratio	5.75	
Effective power at 4000 rpm	47 HP	46 BHP; 12.9HP RAC
Cylinders arranged in narrow V		Angle of cylinder from vertical is 9 deg. 4 min. [Note 2 <sup>nd</sup> series is 8 deg. 50 min.]
Pistons & rings		1 <sup>st</sup> oversize = 72.10 mm 2 <sup>nd</sup> oversize = 72.51 mm 3 <sup>rd</sup> oversize = 72.81 mm  From car 38-5695 – new type rings
Crankshaft		Front main bearings width = 32 mm From engine 38-3816 a new type of starting dog fitted (#38-1785A)
Connecting rods		New type with anti-friction big-end bearing from engine 38-7701 or cars 38-6549 to 7896
Valves	Inclined overhead, actuated by one camshaft driven by silent chain fitted with automatic tensioner	
Valve timing	Done by adjusting valves to a tappet clearance of 0.5 mm	Set valve clearance to 0.25 mm (0.010"). Set timing at 0.45 mm stops at 800 rpm Marked 1/3 on flywheel
Valve timing – inlet	Open 2 deg. before TDC Closes 45 deg. after BDC	opens 4 deg. BTDC, closes 42 deg. ABDC
Valve timing – exhaust	Opens 40 deg. before TDC Closes 2 deg. after BDC	opens 42 deg. BBDC, closes 4 deg. ATDC
Tappet – valve clearance – normal conditions	0.25 mm with hot engine	0.010 inches hot engine
Timing chain		114 links, 0.375" pitch
Flywheel		120 teeth (Gap 126.16) Spigot bearing: Lancia 2048013, RIV 04A?, SKF 6200 - 10 x 30 x 9 mm Diameter to be turned to 10.625" + 0.020 for Rodway gear Marked 1/3 for valve timing Marked AA for ignition timing
<b>Fuel System</b>		
Fuel pump	AC mechanical diaphragm pump	From cars 38-3583, 39-1575 new petrol pump fitted
Carburettor	Zenith Tipo 32 VIM with starting device & silencer	
Jets & other sizes		
Diffuser	24 mm	
Main jet	1.10 mm	
Compensating jet	0.60 mm	
Slow running jet	0.70 mm	0.60 mm
Starter Jet	1.30 mm	4 starter bushes
Valve on starter device	4.00 mm	
<b>Lubrication</b>		
Oil pump	Mechanical gear pump with disc/vane type self-cleaning filter providing forced feed to all units	

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Oil relief valve		Angle of oil relief valve plunger = 60 – 66 deg. (knife edge seating)
Oil pressure		Hot engine - normal mark on gauge = 43 psi
Oils to be used in engine	Gargoyle Mobiloil A Veedol Medium 3	
<b>Cooling System</b>		
Water pump		Bearing: Lancia 2048099, RIV 6165, SKF 6302 - 15 x 42 x 13 mm RIV 6165; 1-off
Running Temperature		75 – 80 deg C
Thermostat		Cable length with Crosby thermostat = 15.5 “
Fan-belt		39” length
<b>Ignition System</b>		
Battery	6 volt	6 volt; 60 Amp.hr
Distributor	Marelli ST 489, 6 volt Automatic advance = 33 deg. Fixed advance = 10 deg. Contact breaker gap = 0.3 – 0.4 mm	Ignition fires 43 deg. BTDC including advance with gap 0.3 – 0.4 mm (0.011 – 0.015”). Automatic advance starts at 500 rpm Flywheel marked AA for ignition timing
Spark plugs	Electrode gap = 0.6 mm	Champion J8, 14 mm size Electrode gap = 0.024 inches
	Firing order = 2-1-3-4	 <p>Anti-clockwise</p>
Starter		2 brushes ID = L23 W16 T.7
<b>Transmission</b>		
Clutch	Dry, single plate	2 linings of 178 mm od; 129 mm id & 3.1 mm thickness Thrust bearing: Lancia 2048701, RIV 9446 a? - 35 x 55 x 20.5 or 35 x 57/60 x 18.5 mm From cars 38-5417, 39-1845 new type of clutch fitted. See 'Flywheel' for spigot bearing
Gearbox	Attached to engine, 4 forward speeds & 1 reverse, 2 <sup>nd</sup> & 3 <sup>rd</sup> gears silent, gear lever in centre of car	From car 38-3001, 39-1001 modified rear gearbox anchorage (#38-21621)
Gearbox ratios	1 <sup>st</sup> speed = 3.516 to 1 2 <sup>nd</sup> speed = 2.205 to 1 3 <sup>rd</sup> speed = 1.487 to 1 4 <sup>th</sup> speed = 1 to 1 Reverse = 3.516 to 1	3.517 2.246 1.487 Direct 3.517
Gear box bearings		<b>Lay-shaft front:</b> Lancia 2049001, RIV 4 DBQV ch.40 - Roller 17 x 47 x 14 mm; 1-off <b>Lay-shaft rear:</b> Lancia 2048301, RIV 4182e - 17 x 47 x 22.22 mm; 1-off <b>Main-shaft front:</b> Lancia 2049006, RIV 5247 - Roller 13 x 23 x 15.3; 1-off <b>Main-shaft rear:</b> Lancia 2048302, RIV 4183e, SKF 3305 Nm/C3; 25 x 62 x 25.4 mm; 1-off <b>Constant mesh pinion:</b> Lancia 2048302, RIV 4183e, SKF 3305 Nm/C3 – 25 x 62 x 25.4; 1-off <b>3<sup>rd</sup> &amp; 4<sup>th</sup> speed gear:</b> Lancia 2049403, RIV 99170831 – 2.5 x 7.8 mm roller pins; 108-off
Oils to be used in gearbox	Gargoyle Mobiloil Ultra Heavy Veedol Ultra Heavy	

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<p>Remade by Paul Mayo, 13/08/2009 with additional section of information from Lancia (England) Ltd &amp; other sources</p>			
<p>Transmission-propelling shaft</p>	<p>Tubular shaft with 3 flexible disc joints between gearbox &amp; propulsion unit at rear</p>	<p>From cars 38-6589, 39-6612 new type couplings From car 38-8493 – new type fabric couplings <b>Centre support bearing:</b> Lancia 2049003, RIV 1APV ch.40, SKF N204 – 20 x 47 x 14; 1-off</p>	
<p>Propulsion Unit at rear</p>	<p>Aluminium case fixed to a sub-frame with two articulated half-shafts fitted with universal joints which drive the rear wheels</p>	<p>From cars 38-4001, 39-2001 new type non-adjustable differential fitted.</p>	
<p>Crown wheel &amp; pinion, differential &amp; internal drive shafts</p>	<p>Gleason-hypoid bevel &amp; pinion Saloon = 10 x 41 ratio Chassis = 9 x 41 ratio</p>	<p>Saloon = Rear axle ratio = 11 x 40; 4.1:1 Chassis = 9 x 41; 4.55:1 <b>Bevel pinion front bearing</b> – Lancia 2048346, RIV 6043 <b>Bevel pinion rear bearing</b> – Lancia 2049008, RIV 7 DBVX ch.40, SKF NJ306 – 30 x 72 x 19 mm; 1-off <b>Differential side bearings:</b> Lancia 2048015, RIV 6A, SKF 6209 – 45 x 85 x 19 mm; 2-off <b>Drive shaft bearings:</b> Lancia 2048011, RIV 2A; SKF 6205 – 25 x 52 x 15 mm; 2-off</p>	
<p>Rear external wheel drive shafts &amp; Universal joints</p>		<p>In the UK cars exist with the original Italian drive-shafts &amp; CVJs or with a Hardy Spicer British replacement. <b>Italian shafts:</b> <b>Universal joint roller needles:</b> Lancia 2049402, RIV 991707782, SKF – 2 x x9.8 mm; 592-off. <b>Universal joint cartridges:</b> RIV 9382 – 17 x 36/41 x 23.5 mm; 16-off <b>Sliding shaft balls:</b> Lancia 2048021, RIV 90142009; SKF – 9/32" dia.; 108-off</p>	
<p>Oils to be used in propulsion unit</p>	<p>Gargoyle Mobiloil Ultra Heavy Veedol Ultra Heavy</p>		
<p><b>Brake System</b></p>			
<p>Front brakes</p>	<p>Expanding shoes fitted at wheels</p>	<p>Linings = 236 x 60 x 5.5 mm; Front soft, Rear hard</p>	
<p>Rear brakes</p>	<p>Expanding shoes fitted to the inner ends of the half-shafts</p>	<p>Linings = 236 x 60 x 5.5 mm; Front soft, Rear hard</p>	
<p>Pedal operation</p>	<p>Lockheed hydraulic type at front &amp; rear</p>		
<p>Hand operation</p>	<p>Entirely independent on the rear drums</p>	<p>By cable</p>	
<p><b>Steering System</b></p>			
<p>Steering box</p>	<p>Worm &amp; helicoidal sector</p>	<p><b>Upper worm bearing:</b> Lancia 2048304, RIV 9054, SKF 7204 - 20 x 47 x 14 mm; 1-off <b>Lower worm bearing:</b> Lancia 2048303, RIV 9053, SKF 7203 - 17 x 40 x 12 mm; 1-off <b>Needle pins:</b> RIV 99172469 - 2 mm dia. x 11 mm long; 84-off</p>	
<p>Oils to be used in steering box</p>	<p>Gargoyle Mobiloil Ultra Heavy Veedol Ultra Heavy</p>		
<p><b>Suspension, Wheels and Tyres</b></p>			
<p><b>Front suspension</b></p>	<p>Independently sprung by patented system of coil springs &amp; hydraulic shock absorber</p>	<p>Cars 38-3428 &amp; 39-1088 have 1<sup>st</sup> type of front suspension From cars 38-3001, 39-1001 – 2<sup>nd</sup> type front suspension From cars 38-8158 &amp; 39-3042 – 3<sup>rd</sup> type front suspension</p>	
<p>Oils to be used for front suspension</p>	<p>Gargoyle Mobiloil A Veedol Medium 3</p>		

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Front axle/wheels data:		
Toe-in		Parallel to 2 mm; also stated as 6 mm & 7mm
Camber		2 deg. 17'
Caster angle		0 deg. Taken care of by the stub axle being placed 10 mm at the back of the centre of the front axle suspension cylinder
King pin inclination		4 deg. also 0 deg. stated
Turning angle		22 deg. 30'
Wheel camber		30 mm for 140 x 40 wheels 17 mm for 165X400 wheels
Front hub bearings: Lancia parts 2048008 (inner), 2048009 (outer)		Inner = 30 x 72 x 19 mm RIV 7B or SKF 6306; 2-off Outer = 20 x 47 x 14 mm RIV 1A or SKF 6204; 2-off
<b>Rear suspension</b>	Wheels also independently sprung by patented system comprising a transverse semi-elliptic spring which bears to 2 moving arms & two torsion bars bearing on the moving arms	
Torsion bars		<b>Torsion bar setting on Saloon:</b> Italian coupling non-greaser = 159 mm Italian coupling greaser = 155 mm English/Hardy Spicer coupling = 164 mm Datum is horizontal line joining shock absorber fixing bolts. <b>Torsion bar setting on Chassis:</b> Italian coupling = 143 mm English coupling = 148 mm Datum line is 15 mm above underside of chassis or Set 128 mm from flange to centre line on plate of body. Special torsion bars fitted to all 6-seater saloons for independent rear wheel springing. <b>Torsion bar bearing:</b> Lancia 2048307 or 2048056, RIV Tipo 137827 or 5741 – 45 x 78 x 18 mm; 2-off
Rear wheel hub bearings		<b>Inner:</b> Lancia 2048011, RIV 2A but later Lancia 2049054, RIV 2 DAQV ch.40 both - 25 x 52 x 15 mm; 2-off <b>Outer:</b> Lancia 2048008, RIV 7B – 30 x 72 x 19; 2-off. Bearing catalogues & series 2 Aprilia parts catalogues list this item as Lancia 2048349, RIV 4AANO or 7540 – 35 x 72 x 22.22 mm; 2-off (?)
Shock absorbers	SIATA friction type with remote hydraulic control	From cars 38-5026, 39-1707 new type shock absorbers fitted. From cars 38-7896 & 39-3041 – Telecontrol shock absorbers fitted
Rear spring		No camber when fitted 1 ¼ " camber when free Distance between spring eye centres: 40.75" when fitted 31 3/16" when free Deflexion load = 14.3" per ton or 11.05" with 1732 lbs
Wheels up to Saloon 238-6500 & Chassis 239-2421	Fergat wheels with 165 x 400 rims	

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Tyres	Michelin 165 x 400 140 x 40 (up to Saloon 238-6500 & Chassis 239-2421)		165 x 40 on Pilot wheels 14 x 40 or 140 x 40 on Ordinary (Fergat) wheels		
Tyre pressures	Front – 1.2 bar Rear – 1.4 bar		24 psi or 14x40 – 26 psi; 140x40 – 22 psi 165x4.00 Front – 17 psi; Rear – 20 psi		
<b>Electrical Equipment</b>					
Supplied by	MABO, 6 volts		Lighting & starting on Marelli 6 volt; 60 Amp Hr Coil; some cars with Scintilla Mag. N.V.4.1		
Dynamo			2 brushes ID = L20 W14 T.6 Front bearing = Lancia 2048043; SKF 6300 – 10 x 35 x 11 mm Rear bearing = Lancia 38-6189; SKF 393065 or E15?; RIV 2065b – 15 x 35 x 8 mm		
Dash-board & controls			From cars 38-7896 & 39-3041 – Square dash instruments & self-cancelling indicators		
<b>Interior Fittings</b>					
Additional items			From 1938 UK cars: ash-trays, leather upholstery, chromium beading on dash- board		
Dash-board lamp-holders			From cars 38-3101, 39-1029 new type fitted		
Instruments			From car 38-6533 a few standard cars fitted with (round) Jaeger instruments instead of Metron type		
<b>Exterior Fittings</b>					
Running boards			From 1938 UK cars		
Door catches			From cars 38-5026, 39-1707 new type fitted		
<b>Principal Dimensions</b>					
	<b>Saloon/Berlina</b>	<b>Chassis/Telaio</b>	<b>Saloon/Berlina</b>	<b>Chassis/Telaio</b>	
Overall length	3955 mm over bumpers	3850 mm without bumpers	13' 7.5"	12' 7.5"	
Overall width	1500 mm over mudguards	1470 mm over wheels	4' 10"	4' 7.25"	
Max. height, loaded	1455 mm	depends on body fitted	4' 9.5"	depends on body fitted	
Wheelbase	2750 mm	2850 mm	9' 0.25"	9' 4"	
Track	1286 mm	1286 mm	4' 1.75"	4' 1.75"	
Min. turning radius	5000 mm	5200 mm	16' 4.75"	17' 0.75"	
Height from ground under load	230 mm	285 mm	7"	7"	
Min. height from ground under load	190 mm	190 mm			
Weight in working order with 1 spare wheel	Standard = 880 kg De Luxe/Lusso = 895 kg	650 kg	16.75 cwt, increased slightly on 1939 type	11.5 cwt	
<b>Tank Capacities</b>					
Petrol	50 litres		10 gallons with 1 – 1.5 in reserve		
Water – radiator & engine	7 litres		1.5 gallons		
Engine oil	4 kg		1 gallon		
Gearbox oil	8.8 kg		1.75 pints		
Propulsion unit oil	1.0 kg		2 pints		
Steering box oil	0.2 kg				
Front suspension oil	0.415 kg				
Lockheed hydraulic brakes	0.34 kg				

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<b>Performance &amp; Consumption</b>	<b>Standard Saloon/Berlina</b>	
Max. speed in top gear	125 kph	80-85 mph; Max. rpm approx. 4000 Cruising speed – 65-70 mph; Service rpm approx. 3600
Hill climbing with full load of 1180 kg	1 <sup>st</sup> gear = 26% 2 <sup>nd</sup> gear = 16% 3 <sup>rd</sup> gear = 10% 4 <sup>th</sup> gear = 5%	
Petrol consumption	10 litres per 100 km	28-30 mpg
Range on full fuel tank	about 500 kms	
Engine oil consumption	0.100 litres per 100 km	
<b>Summary of Maintenance Instructions</b>		
<b>Before starting up</b>	Check engine oil level & top up if required	
	Check radiator water level & top up if required	
	Check tyre pressure & adjust as required	
<b>When using the car</b>	Check oil gauge & oil pressure	
	Make sure radiator shutters function properly	
<b>After first 1000 km of a new car or engine</b>	Change engine oil in sump	
<b>Every 3000 kms check &amp; adjust or top up as necessary:</b>	<ol style="list-style-type: none"> <li>1. Change <b>Engine</b> oil in sump</li> <li>2. Clear dirt &amp; carbon deposits from the SAMUNDAT oil filter</li> <li>3. Clean petrol pump filter</li> <li>4. Check &amp; adjust valve tappet clearances</li> <li>5. Apply 2 turns to the greaser cup on the distributor</li> <li>6. Check tension on fan belt &amp; tighten</li> <li>7. Check compression in cylinders</li> <li>8. Check <b>Clutch</b> pedal play.</li> <li>9. Check <b>Gearbox, Propulsion unit &amp; Steering box</b> oil levels.</li> <li>10. Check <b>Brake</b> reservoir level, inspect brakes, adjust.</li> <li>11. <b>Battery</b> fluid level – use distilled water</li> </ol>	
<b>Every 4000 kms</b>	Grease universal joints	
<b>Every 10,000 kms</b>	<ol style="list-style-type: none"> <li>1. Change oil in <b>Gearbox &amp; Propulsion</b> unit</li> <li>2. Grease <b>Wheel</b> bearings</li> <li>3. Fill grease boxes attaching steel ropes at end of <b>Rear transverse spring</b></li> <li>4. Lubricate <b>Prop-shaft</b> central support</li> <li>5. Thoroughly clean SEMUNDAT <b>Oil filter</b></li> </ol>	
<b>Every Month</b>	Change water in radiator	
<b>Every 3 or 4 Months</b>	Check & clean Battery Fit/rotate spare Wheel	