Peugeot 206 Workshop Manual



<u>TUxJP</u> Engines ONLY (Otto engines)

Compiled by **Jasycs** 2021 MODEL CODE 206

T00 : All models .

T15: TU1JP engine.

T16: TU3JP engine.

T17: TU5JP engine.

T2L: DW8 engine .

T2M : DW10TD engine .

T3R : EW10J4 engine .

T42 : Automatic gearbox .

T72: 5-door.

T73: 3-door.

T76 : Coupe - Cabriolet .

T80: Sun roof.

T90: Two-coat paint.

T92: 5-door Two-coat paint.

T93: 3-door Two-coat paint.

T96 : Coupe - Cabriolet Two-coat paint .

Non Metallic BLACK paint code: EXY for 206

This Workshop manual version may not cover all about TU5J4 engines

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1-Lifting the Vehicle

Erguendo o veículo

RAISING FROM ONE SIDE



Position the axle stand in the location provided for lifting the vehicle using the jack .

NOTE : to have 4 wheels suspended, repeat the operation on the other side . The bar [1] is an optional special tool for lift the vehicle, but you can lift without it.

2-Towing the Vehicle

Rebocando o veículo

FRONT



REAR



Hook up to the towing eye (1).

Hook up to the towing eye (2).

To tow the vehicle, select the Neutral (N) gear and release the brakes

3-Prolonged Storage

Veículo Estacionado por muito Tempo



In the event of prolonged storage.

Position:

- fuse R3 between F5 and F6 = position P
- the shunt in place of R3

Imobilize the vehicle:

- in first gear (manual gearbox)
- position P (automatic gearbox)

The owner's manual recommends removing the negative (-) terminal from the battery if the vehicle stays more than one month stopped. When you start the vehicle after this period, keep the engine running for 2 minutes, without moving the car, so the ECU can check sensors, air-fuel mixture, operational system and other components.



(7): VIN label, stuck to the bodywork, and visible from the outside through the windscreen .

(9) : Label stuck to the upper left shock absorber support (in the engine compartment) indicating :

- Build code
- serial number
- paint code

5-Identifying Engine Model

Identificar Modelo do Motor

1ST GENERATION



(1)Aluminium cylinder block, The engines may be identified in two ways : (A) Plates set into the cylinder block unit - (B) Engraving .

(A) Identification plate comprising :

- the component reference
- the legislation type
- serial number

(B) Engraving area comprising :

- the component reference
- the legislation type
- serial number

(2) Cast-iron cylinder block, (B) Engraving area comprising :

- the component reference
- the legislation type
- serial number

engine type	legislation type		
TU9/K	C1A		
TU9/W	C1B		
TU9M/L/Z/L3	CDY - CDZ		
TU9 TR/K	C3A		
TU1/K/N	H1B		
TU1/W	H1C		
TU1 CP	HAZ		

TU1M/L/Z TU1M/L/L3 TU1M+ to 2616141	HDY - HDZ
TU1 TR	НЗА
TU2.4	M2A - M4A
TU2J2/L/Z	MFZ
TU3A/K TU3A/N	K1C - K1G K1B - K1D - K1H
TU3S/K TU3S/N	K2A K2B
TU3.2/K - TU3F.2/K TU3.2/W TU3.2 TR/K	K2D K2C K5A
TU3 TR	КЗА
TU3JP to 2333357	KFX
TU3M/Z - TU3FM/Z TU3M/L/Z - TU3FM/L/Z	KDY - KDZ KDY
TU3MC/L/Z - TU3FMC/L/Z	KDX
TU3J2/K TU3J2/L/Z	K6B KFZ
TU5JP/L/Z	NFZ
TU5J2/L/Z/K'	NFY - NFW

2ND GENERATION





(3)Engine : Aluminium cylinder block .

(4) Engine : Cast-iron cylinder block .

(B)/(C) - Engraving area comprising :

- the component reference the legislation type serial number •
- •
- •

engine type	legislation type	unit reference
TU1M+ from 2616142	HDY – HDZ	10FP4X 10FP4Y 10FP5C 10FP5D 10FP5M
TU1JP	HFY HFZ	10FP5N 10FP5P 10FP4Z
TU3JP/L3 from 2333358	KFX	10FS7R 10FS7Z 10FS7Q 10FS7T 10FS7U 10FS8N
TU3JP/tax incentive L4	KFX	10FS7W 10FS8M 10FS8P 10FS7X
TU5JP/L3 from 344274	NFZ	10FX1G 10FX1H 10FX1K

engine type	TU9M	TU1M+	TU1	TU3.2	TU3JP	TU5JP	TU5J2
number of cylinders	4	4	4	4	4	4	4
bore x stroke (mm)	70 x 62	72 x 69	72 x 69	75 x 77	75 x 77	78.5 x 82	78.5 x 82
capacity (cm3)	954	1124	1124	1360	1360	1587	1587
compressio n ratio	9.1/1	9.4/1	8.4/1	8.8/1	10.2/1	9.6/1	10.2/1
maximum power (KW - EC)	33	40	37.5	55	55	65	74
maximum power (HP DIN)	45	54	51	75	75	88	100
engine speed at max. power (r.p.m.)	6000	6200	5400	5800	5500	5600	6200
maximum torque (da.Nm)	7.35	8.75	8.5	11.4	11.1	13.5	13.2
engine speed at max. torque (r.p.m.)	3600	3700	3200	3800	3400	3000	3500
injection system	monopoin t injection	monopoin t injection	Carburetto r	Carburetto r	multipoint injection	multipoin t injection	multipoint injection
make	BOSCH	BOSCH	SOLEX	SOLEX	MAGNET I – MARELL I	BOSCH	MAGNET I – MARELL I
type	MA3.1	MA3.1	32 PBISA 16(411)	32-34 CISAC (528/5)	1AP	MP5.2	8P

6-Engine Data

7-Draining, Filling and Bleeding Cooling System

Drenar, Encher e fazer Sangria do Sistema de Arrefecimento



TU ENGINE

ALL MODELS

Carefully remove the expansion chamber cap.



Unscrew the radiator drain plug (1).

NOTE : fit a pipe to the outlet to allow clean drainage of the system.



FILLING AND BLEEDING THE SYSTEM

Before any re-filling operation, flush the cooling circuit with clean water .

WARNING : check the cooling system for leaks.

ALL MODELS

Fit the filling cylinder [1] to the filler opening.

Open all the bleed screws .

Fill the circuit slowly with coolant .

Close the bleed screws in the order in which the liquid flows without bubbles .

The filling cylinder must be filled to the 1 litre mark to bleed the heater matrix correctly

Start the engine .

Maintain the engine speed at 1500 to 2000 rpm until the end of the second cooling cycle (fan(s) starting then stopping) keeping the filling cylinder filled to the 1 litre mark .

Stop the engine .

Remove the filling cylinder [1].

Immediately tighten the plug on the expansion chamber .

If necessary fill up to the level of the maximum mark (Engine cold).

8-Removing the Engine and Gearbox

Remover o Motor e a Caixa de Câmbio

REMOVAL

Drain :

- THE COOLING SYSTEM
- the engine

GEARBOX

Drain : The gearbox .



ALL MODELS

Remove :

- the battery (1)
- air inlet/air filter neck unit (2)
- the injection-ignition control unit (3)
- the battery container (4)
- the battery tray
- the accelerator cable (5)
- the engine coolant outlet/radiator inlet pipes



Disconnect :

- the electrical connections (6)
- the inertia switch (7)
- the earth point (8) on the left chassis leg

Remove the clutch cable .



Disconnect the connector (9).



Unclamp the pipes (10) on the bulkhead .

Disconnect the electrical connection (11).

Remove the gearbox controls .



Uncouple the click-on clip (12) on the vacuum take-off for the braking assistance on the inlet manifold .

Lower the pressure in the injector supply pipe by means of the pump [6].

Disconnect the click-on connectors for fuel supply and return on the injection rail .

Remove :

- the front right-hand wheel
- the mud shield (right side)



Disconnect and unclamp the connector on the lambda sensor (13).

Remove :

- the catalytic converter (14)
- the heat shield (15)
- THE DRIVE SHAFTS

POWER STEERING



Remove :

- THE ANCILLARY DRIVE BELT
- the power steering pump fixing bolts
- the heat shield fixing bolts (16)

Move aside the power steering pump without opening the high pressure pipes .

AIR CONDITIONING

Remove the compressor securing bolts .

Move aside the air conditioning compressor without opening the pipes .

Disconnect the connector located under the coolant reservoir.

ALL MODELS



ALL MODELS

Remove the bolt securing the reaction link (17) to the body .

Position the lifting tools [1] - [2] - [3] and switch them on .



Remove :

- the flexible mounting (18) •
- the bracket (19) •

Move aside the gearbox mounting plate (20).



Remove :

- the engine mounting (21) the cooling radiator •
- •

Protect the cooling radiator with stiff cardboard .

Remove the power train from below the vehicle .

9-Tightening Torque

Torque de Aperto

POWER TRAIN MOUNTINGS



reference/ description	da.Nm
special features	-
(2) support plate	-
(3) stops	-
(4) right engine mounting fastener	4.5
(5) right-hand engine mounting fastener to flexible mounting	2.75
(6) fastener for flexible mounting	3



special features	-
(7) gearbox mounting fixing to left side flexible block	8.5
(8) the shaft	2.5
(9) flexible mounting to bracket fastening	6.5
(10) flexible mount bracket to body	-
(11) flexible mount bracket to body	3



reference/ description	da.Nm
special features	-
(12) gearbox mounting fixing to left side flexible block	5.5
(13) the shaft	5
(14) flexible mounting to bracket fastening	8.5

ENGINE

~

15	_18
16	
22 20 24	25
reference/ description	da.Nm
special features	-
(15) cylinder head cover	1
(16) camshaft bearings, pre-tightening	-
(16) camshaft bearings, tightening	2
(17) inlet manifold	-
(18) inlet manifold	2
(19) exhaust manifold	2
(20) crankshaft bearings, pre-tightening	2
(20) crankshaft bearings, tightening	+50°
(21) main bearing cap side fastening	-
(22) big end caps	3.75
(23) flywheel	6.5
(24) crankshaft bolt(s)	11
(25) sump	1

TIGHTENING TORQUE(S) ENGINE (NOT TU5J4)



Camshaft pulley (1) : 1 da.Nm .

cylinder head			
	TU (not TU5J4)	TU (not TU5J4)	
special features	aluminium cylinder block	cast-iron cylinder block	
(a) pre-tightening (da.Nm)	2	2	
(a) slackening	-	-	
(a) tightening (da.Nm)	-	-	
(a) 1st angular tightening	240°	120°	
(a) 2nd angular tightening	-	120°	
(a) 3rd angular tightening	-	-	
(a) application of a tightening sequence and/or a special product			

- (3) Cylinder head cover to cylinder head (M8) : 1.6 da.Nm .
- (3) Cylinder head cover to cylinder head (M6) : 0.7 da.Nm .
- (4) Compact coil block (Depending on engine type) : 0.8 da.Nm .
- (5) The inlet manifold : 1 da.Nm .
- The injection pipe : 0.7 da.Nm .

(6) The thermostat : 0.6 da.Nm .

(7) The coolant temperature sensor : 1.8 da.Nm .

(8) The exhaust manifold :

- short nut : 2.5 da.Nm
- long nut : 1.6 da.Nm

(9) The heat shield : 0.8 da.Nm.

Camshaft fork fixing : 1.5 da.Nm .

The spark plugs : 2.8 da.Nm .

Rocker adjustment :

- locknut with a bolt (M9) : 1.75 da.Nm
- locknut with a bolt (M6) : 0.9 da.Nm



(18)The nipple (To cylinder block) : 0.8 da.Nm + LOCTITE FRENBLOC.

- The knock sensor : 2 da.Nm .
- (19) The sump : 0.8 da.Nm .
- (21) The timing gear (To crankshaft) : 10 da.Nm .
- (22) The tensioner roller : 2.2 da.Nm.
- Oil pressure switch (23) : 2.2 da.Nm .

(24) The electric gauge : 2.7 da.Nm .

Oil gallery plug to cylinder block : 3 da.Nm .



crankshaft and co	nnecting rods	
	TUnot TU5J4	TUnot TU5J4
special features	aluminium cylinder block	cast-iron cylinder block
(20) bolts for main bearing cap castings/main bearings or shells/bearings : pre-tightening : (da.Nm)	(M11) 2	2
(20) bolts for main bearing cap castings/main bearings or shells/bearings slackening	-	-
(20) bolts for main bearing cap castings/main bearings or shells/bearings : (da.Nm)	(M6) 0.8	-
(20) bolts for main bearing cap castings/main bearings or shells/bearings (°)	44°	49°
(21) con rod cap : (da.Nm)	3.8	3.8

(21) con rod cap (°)	-	-
(22) seal carrier plate : (da.Nm)	0.8	0.8
(23) flywheel/crankshaft assembly : (da.Nm)	6.7	6.7
(23) flywheel/crankshaft assembly (°)	-	-
(24) flywheel/crankshaft assembly : (da.Nm)	-	1

10-Air Conditioner Compressor

Compressor do Ar Condicionado

REMOVAL

Drain the refrigerant circuit.

Remove the ancillary drive belt .



Remove the bolt (1).

Disconnect the compressor inlet and outlet pipes .

IMPERATIVE : quickly seal the compressor inlets and outlets and the pipes .



Disconnect the connector (2).

Remove the securing bolts (3).

Remove the compressor.

REFITTING

TU1JP ENGINE TU3JP ENGINE



Check that the pins (4) are present.

TU5JP ENGINE



Check that the pins (4) are present .

ALL MODELS

Gently push back the pins (4) into their housing .



Refit the compressor.

IMPERATIVE: tighten the securing bolts to the required torque value starting with the front bolts (3).

Tightening torque : 2.5 da.Nm .

Re-connect the connector (2).

IMPERATIVE : reconnect all the connectors fitted with new seals, lubricated with compressor oil .

Tighten the bolt (1) to 4 da.Nm.

Fit the ancillary drive belt .

Charge the refrigerant circuit.

<u>11-Dismantling the Engine</u>

Desmontando o Motor

Place the engine on the stand [1].



Remove :

- the cylinder head cover (1) and its gasket
- the two spacers (2)
- the deflector plate (3)
- the heat shield (4)



Remove :

- the exhaust manifold (7)
- the exhaust manifold gaskets
- the oil filter (8)
- the nipple (9) (according to specification)
- the heat exchanger (10) (according to specification)

- the dipstick (11)
- the dipstick tube (12)
- the electric gauge (13) (according to specification)
- the oil pressure switch (14)



Remove :

- the compact coil unit (15) (depending on engine type)
- the injection pipe (16)
- the inlet manifold (17)
- the thermostat (18)
- the coolant temperature sensor (19)
- the lifting plates (20)
- the knock sensor (21)



Remove :

• the timing cover components (22)



Fit the pins [2], [4].

Slacken the bolt (23).

Remove the timing belt (24).

Remove the tensioner roller (25).

Release the bolt (26), Using the tool [3].


IMPERATIVE : starting at the outside and working in a spiral sequence progressively slacken the cylinder head bolts (27).

Remove the cylinder head bolts .



Rock the cylinder head using the levers [5] to release it .

Remove :

- the cylinder head
- the cylinder head gasket



- (A) Aluminium cylinder block :
 - position the liner retaining clamps [7]





Remove the centralising dowels (28).



Remove the rod [2] from the flywheel.

Insert the flywheel stop [6].



(A) Aluminium cylinder block, Remove :

- the pins (30)
- the seal (31)



(B) Cast-iron cylinder block .

Remove :

- •
- the coolant pump (29) the oil gallery plug (32) •



Remove :

- the crankshaft gear (33) •
- the spacer (34)•



Remove :

- the clutch mechanism (35)
- the clutch plate (36)
- the flywheel (37)
- the oil gallery plug (38)

ALUMINIUM CYLINDER BLOCK



Remove all of the securing bolts (39) and (40) from the main bearing cap casting .



Remove :

- the nuts (41)
- the bolts (42)
- the sump (43)



Remove :

- the oil pump (44)
- the oil pump centralising pin



Remove :

- the securing bolts (45)
- the main bearing cap casting (46)
- the crankshaft oil seal (timing gear end)
- the crankshaft oil seal (flywheel end)



Remove :

- the oil pump drive gear (47)
- the oil pump drive chain (48)
- the cotter (49)
- the big end caps (50)
- the crankshaft (51)
- the bearing half-shells
- the end float adjustment thrust washers (52)

NOTE : mark the shell bearings in relation to the big end caps before removal.



Remove :

- the liner retaining clamps [7]
- the liners/con rods/pistons assemblies (53), marking the liners in relation to the cylinder block if the liners are to be re-used

Carefully clean all the seal surfaces using scouring product D2 .

CAST-IRON CYLINDER BLOCK



Remove :

- the sump (43)
- the oil seal carrier plate (54)

Extract the seal (55).

Remove :

- the oil pump (44)
- the oil pump centralising pin (56)
- the oil pump chain and drive pinion
- the cotter (49)



Remove the oil seal carrier plate (57).

Extract the seal .



NOTE : mark the big end caps and shells before removing them .

Remove :

- the big end caps (58)
- the crankshaft bearing caps (59)

NOTE : the main bearings are numbered from 1 to 5, with no. 1 at the flywheel end .

Remove :

- the two end float half washers in no. 2 main bearing, cylinder block side
- the crankshaft
- the shells



Remove the piston/connecting rod assemblies, marking them (if necessary).



Remove the piston base cooling jets (60).

<u>12-Engine Measuring Data</u>

Dados de Medidas do Motor

CYLINDER BLOCK (Aluminium engine)



IMPERATIVE: the cylinder block (1) and the main bearing cap casting (2) are matched and inseparable.



Flatness :

• maximum permissible bow = 0.05 mm

LINERS



The cylinder block is sealed by an O-ring (3).

There are 3 categories of diameter (dia. B) for each liner .

The 3 categories are identified at (E) in two ways :

- file mark
- ink mark (letter and dash)

Identification of categories :

- A file mark(s) or hyphen(s): category liner
- B file mark(s) or hyphen(s): category liner
- C file mark(s) or hyphen(s): category liner

IMPERATIVE : fit pistons of the same category as the liners (see piston identification).

		height (mm)			
engine type	category A	category B	category C	С	D
TU9	70 to 70,01	70,01 to 70,02	70,02 to 70,03	85	122,5
TU1	72 to 72,01	72,01 to 72,02	72,02 to 72,03	0	0 - 0,5
TU2J2 - TU3	75 to 75,01	75,01 to 75,02	75,02 to 75,03	90 ± 0,015	135,4

TU2.4	85 + 0,03 0
-------	-------------------

DATA - IDENTIFICATION CAST CYLINDER BLOCK (NOT TU5J4)



(A) : Identification (R1) engraved on the cylinder block (Repair size) .

	ø + 0 + (n	A ,018 - 0 1m)	B ± 0,1 (mm)	
engine type	Nominal	repair 1	nominal	
TU3	75	75,4	265.22	
TU5	78,5	78,9		

GRINDING THE BARRELS

IMPERATIVE : after reboring the barrels lap them, referring to the instructions.



- (C) : Location of the lift rate measurement .
- (D): 10 mm.
- (E):65 mm.
- (F): 125 mm.
- (à) : $50^{\circ} \pm 5'$ Lapping detail, crossed lines .

LIFT RATE

To take the following measurements, observe the correct locations (C) .



R maximum = 15.

Measurement of lift rate :

- in accordance with standard E4072 110N ISO 4288 without mechanical or electrical filtering
- sensing distance = 16 mm
- three measurements per barrel on the protrusion side (oil filter side) which is 12 measurements per cylinder block

Lift rate :

- two protrusions allowed, except where they are in the same barrel
- in this case, you can make 7 additional measurements in the faulty barrel with acceptance if there is no protrusion

3 - SHAPE AND POSITION TOLERANCE



- (G): Straightness.
- (H) : Conformity of cylindrical shape .
- (I): Flatness.

MEASUREMENT OF STIFFNESS



(J): Ball location .

(K): 50 mm.

(à): 60° .

Measure the diameters V, X, Y, Z at each point D, E, F.

 $TU3:75 \leq V,\,X,\,Y,\,Z \leq 75,\!018$.

 $TU5: 78,5 \le V, X, Y, Z \le 78,518$.

Maximum variation among 12 measurements = 0,018 m

13-Valves Data

Informações das Válvulas

DATA VALVE GUIDES



	Nominal		repa	repair 1		repair 2	
engine type	øA (mm) + 0.039 + 0.028	B (mm) ± 0.3	øA (mm) + 0.039 + 0.028	B (mm) ± 0.3	øA (mm) + 0.039 + 0.028	B (mm) ± 0.3	
TU9 - TU1 - TU3 not TU3J2 (see note)		47.5		47.5		47.5	
TU9 - TU1 - TU3 not TU3J2 (see note)	13.02	48.5	13.29	48.5	13.59	48.5	
TU3J2 TU2 TU5		48.5		48.5		48.5	

NOTE : the standardisation of the TU valve guides to the other petrol engines has led to the modification of the dimension for positioning the guide in the cylinder head.

MACHINING IN CYLINDER HEAD



nominal		repair 1	repair 2	
engine type	ø C (mm)	ø C (mm)	øC (mm)	
TU all models	12,965+ 0.032 -0	13,195+ 0.032 -0	13,495+ 0.032 -0	

FITTED VALVE GUIDES



	D (mm) + 0.022 + 0	E (mm) ±			
engine	Adm/Ech	Adm	Ech		
TU9 - TU1 TU3 not TU3J2 (see note)	7	14,57	14,07		
TU9 - TU1 TU3 not TU3J2 (see note)	7	14,07	13,07		
TU3J2 TU2J2 - TU5	7	16,15	15,15		
TU2.4	8	15,17	13,67		
Adm : inlet Ech : exhaust					

NOTE : the standardisation of the (E) value guides in relation to the other petrol engines has led to the modification of the dimension for positioning the guide in the cylinder head.



VALVE	SEATS
-------	-------

inlet : engines - 1st generation						
	engine type : TU9			engine type : TU1 - TU3 (except TU3J2)		
distance (mm)	nominal	repair 1	repair 2	nominal	repair 1	repair 2
ø A + 0,137 + 0,112	36,01	36,31	36,51	38,01	38,31	38,51
B + 0,1 + 0	6,648	7		6,648	7	
à	120°			120°		

	engine type : TU2.4			engine TU	engine type : TU2J2 TU3J2 - TU5		
distance (mm)	nominal	repair 1	repair 2	nominal	repair 1	repair 2	
ø A + 0,161 + 0,136	40,51	40,81	41,01	40,51	40,81	41,01	
B + 0,1 + 0	6,6	7		6,6	7		
à	90°			90°			

inlet : engines - 2nd generation							
	engine t	ype : TU	1 - TU3	engine	e type : T	U5JP	
distance (mm)	nominal	repair 1	repair 2	nominal	repair 1	repair 2	
ø A + 0,137 + 0,112	38,01	38,31	38,51	40,51	40,81	41,01	
B + 0,1 + 0	6,648	7		6,6	7		
à	90°			90°			

Exhaust							
	engine type : TU9			engine type : TU1 - TU3 (except TU3J2)			
distance (mm)	nominal	repair 1	repair 2	nominal	repair 1	repair 2	
Ø A (TU9) + 0,109 + 0,088 Ø A (TU1/3)	29,51	29,81	30,01	31,01	31,31	31,51	
+ 0,137 + 0,112							
B + 0,1 + 0	6,648	7		6,648	7		
à	90°			90°			

	engine type : TU2 - TU3J2 - TU5						
distance (mm)	nominal	repair 1	repair 2				
ø A + 0,137 + 0,112	33,01	33,31	33,51				
B + 0,3 + 0	6,6	7					
à	90°						

2 - MACHINING IN CYLINDER HEAD



(1) Inlet.

(2) Exhaust.

	engin	e type :	TU9	engine type : TU1 - TU3 (except TU3J2)		
distance (mm)	nominal	repair 1	repair 2	nominal	repair 1	repair 2
ø C ± 0,025	29,50	29,80	30	31	31,30	31,50
D + 0,3 + 0	15,465	15,817		15,465	15,817	
ø E ± 0,025	36	36,30	36,50	38	38,30	38,50
F + 0,3 0	15,193	15,545		15,193	15,545	

	engine type : TU2 - TU3J2 - TU5						
distance (mm)	nominal	repair 1	repair 2				
ø C ± 0,025	33	33,30	33,50				
D + 0,3 + 0	15,465	15,817					
ø E ± 0,025	40,5	40,8	41				
F	15,193	15,545					

FITTED VALVE SEATS



(1) Inlet.

(2) Exhaust.

engines										
1st Generation										
engine type	TU9	TU1 - TU3 (except TU3J2)	TU2.4	TU2J2	TU3J2 - TU5					
distance (mm)	Nomir	nal								
ø G	22,8 + 0,15 + 0	24,3 + 0,15 + 0	$26,5 \pm 0,1$	L						
ø H	26	27,5	29,65							
ø I	27,5 + 0 - 0,15	29,5 + 0 - 0,15	-		33,9 ± 0,1					
ø J	33	35	38,35							
K	0,35 ±	0,1	0,95 ± 0,1	$0,75 \pm 0$),1					
L	$1,35 \pm$	0,1	$1,02 \pm 0,1$	l						

М	0,65	0,46 ± 0,1	$0,266 \pm 0,1$
Ν	$0,75 \pm 0,25$	1,52 ± 0,1	$1,7 \pm 0,1$
P minimum	1,4	-	
Q	$0,75 \pm 0,25$	-	
æ	20°		
ß	33°	30°	
Ç	15°	-	3° 8°

	engines								
2nd Generation									
engine type	TU1	TU1TU3JP/L3TU3JP/tax incentiveTU3JP/KL4							
distance (mm)	Nomi	nal							
ø G	24,3 + 0,15 + 0	i		26,5 ± 0,1					
ø H	27,5			29,65					
ø I	29,5 + 0 - 0,15	29	29,5 + 0 - 0,15	33,9 ± 0,1					
ø J	35			38,35					
K	0,35 ±	: 0,1		0,75 ± 0,1					
L	1,35 ±	: 0,1		1,02 ± 0,1					
М	0,46 ±	: 0,1	$0,65\pm0,1$	0,46 ± 0,1					
Ν	1,52 ±	: 0,1	$0,75\pm0,1$	1,52 ± 0,1					
P minimum	-		1,4	-					
Q	-		$0,75 \pm 0,25$	-					
æ	20°			-					
ß	30°		33°	20°					
Ç	-								

ENGINES - 1ST GENERATION



	ø A (mm)	B (n	B (mm)		(mm)			
engine type	Adm	Ech	Adm	Ech	Adm	Ech			
TU9	34,8	27,9	120°	90°	6,98 + 0 - 0,015	6,96 + 0 - 0,015			
TU2.4	39,3	31,2	90°	90°	7,97 + 0 - 0,015	7,96 + 0 - 0,015			
TU2J2	39,5	31,4	120°	90°	6,97 + 0 - 0,015	6,97 + 0 - 0,015			
TU1 TU3 not TU3J2	36,8	29,4	120°	90°	6,98 + 0 - 0,015	6,96 + 0 - 0,015			
TU3J2 TU5	39,5	31,4	120°	90°	6,97 + 0 - 0,015	6,97 + 0 - 0,015			
	Adm : inlet Ech : exhaust								

ENGINES - 2ND GENERATION

	øA(1	nm)	B (mm)		ø D (mm)	
engine type	Adm	Ech	Adm	Ech	Adm	Ech

TU1 TU3JP	36,7 ± 0,1	29,4	90°	90°	6,98 + 0 - 0,015	6,96 + 0 - 0,015			
TU5JP	39,35	31,4	90°	90°	6,963 ± 0,007	6,97 + 0 - 0,015			
Adm : inlet Ech : exhaust									

	D (1	D (mm) Adm		(mm)				
engine type	Adm			Ech				
TU1 TU3JP	30	30,5	112,76	112,56				
TU5JP	31,8	34,5	111,5	111,5				
Adm : inlet Ech : exhaust								



Only the inlet valves are changed with the angle (B) changing from 120 degrees to 90 degrees; they are identified at (F) by a 4 mm circular recess .

14-Valves Springs Data

Informações das Molas das Válvulas



engine type	colours	ø A	ø B	H1	F1	H2	F2
TU9 TU1 TU3 not TU3F not TU3J2	_	3,6	-	40	28	32	50
TU2.4	grey silver	4,4	30,3 + 0 + 0,4	40,5	36	29,7	91
TU2J2 TU3F TU3J2 TU5	-	4,2	28,65	41,2	31	30	81,4

engine type	colours	ø A	ø B	H1	F1	H2	F2
TU1 TU3	blue	3,4	27,1	37,2	20	28,3	47
TU5	white	3,5	27,25	38,9	20,4	29,5	49,7



(1)Specific service guide .

(2) Production guide .

Interchangeability :

- the earlier springs can be fitted on the cylinder heads machined to the new dimensions on condition that a specific Service guide (1) is fitted
- the new springs cannot be fitted to cylinder heads machined to the earlier dimensions



Identification :

• the cylinder heads machined to the new dimensions are marked by countersinking 1.5 of b mm and depth mm around the sling bracket mounting hole

15-Camshaft Data ID

Informações do Comando de Válvulas

DATA - IDENTIFICATION CAMSHAFTS



The camshafts possess two types of identification :

- marking on the end of the shaft (A), flywheel end
- colour identification (B), (C), (D)

Colour identification (B) :

• this marking is located on the cam ring, flywheel end

Colour identification (C) - (D) :

• this marking is located on the flat section, between bearing no. 2 and the inlet cam A1

engine type	colour identification (B)	colour identification (C)	colour identification (D)	marking on the end of the shaft (A)
TU9	-	Yellow	-	E
TU9M	-	-	yellow	4
TU1 - TU3	-	Green	-	1
TU1M	-	Blue	-	М
TU1M+ to 2616141	orange	-	-	Y

TU3JP to 2333357				
TU1JP	white	-	-	7
TU2.4	-	White	-	2
TU2J2	-	-	black	J
TU3A	-	Orange	-	А
TU3S	-	Black	-	R
TU3.2 TU3F2	-	Brown	-	В
TU3M TU3FM	-	Pink	-	3
TU3MC TU3FMC	-	-	pink	С
TU3J2	-	Beige	-	Z
TU3JP from 2333358 TU1M+ from 26161142	-	-	beige	Н
TU5JP injection control unit MP5.1	Green	-	-	5
TU5JP injection control unit MP5.2 to 344273	Blue	_	-	6
TU5JP/L3 from 344274	_	_	brown	Т
TU5J2	-	-	black	J

camshaft seal bearings				
distance (mm)	nominal	repair 1		
ø F -0.025-0.050	ø 36	ø 35.8		

Grinding of camshaft seal bearings to 0.2 mm (production seals fitted) .

16-Cylinder Head Gasket

Junta do Cabeçote/Bloco

IDENTIFICATION



Identification at the clutch end :

- (A) : engine code marking
- (B) : supplier identification
- (C) : thickness identification





engine type	notch 1	notch 2	notch 3	notch 4
TU9	0	0	0	0

TU1 TU2.4 TU3	1	0	0	0
TU1JP	0	1	0	0
TU2J2	1	1	0	1
TU3JP	0	0	0	1
TU3F	1	0	1	0
TU3J2	1	0	1	1
TU5J2 TU5JP 1st generation	1	0	0	1
TU5JP 2nd generation	0	1	1	0

(R) = Notch present on the gaskets : Repair size .

TU3JP ENGINE

The cylinder head gaskets have been modified between the 1st and 2nd generation engines .

The gaskets of the 2nd generation engines can be fitted to a 1st generation engine .

TU5JP ENGINE

There are 2 types of cylinder head gasket :

- fibre gasket
- metal gasket

WARNING : a metal gasket must be replaced with an identical gasket.

A fibre gasket can be replaced with a gasket of either type .

gasket thickness	not TU5	TU5 engine
nominal dimension	1.20	1.50
repair size	1.40	1.70

17-Adjusting Valve Clearences

Ajustar Folga das Válvulas

NOTE : *minimum time for engine cooling* : 2 *H* .



Remove :

- the cylinder head cover (1) and its gasket
- the two spacers (2)
- the deflector plate (3)



Adjust the valve clearances :

- inlet : clearance 0.20 ± 0.05 (mm)
- exhaust : clearance 0.40 ± 0.05 (mm)

	adj	adjustment	
with valve fully open (exhaust)	inlet	exhaust	

1	3	4
3	4	2
4	2	1
2	1	3

Tightening of the lock nuts :

- ø M9 = 1.75 da.Nm
- ϕ M6 = 0.9 da.Nm

Refit the parts removed .

Tighten the nuts to 0.5 da.Nm .

18-Roller Rockers

Comando das Varetas das Válvulas



The rocker fingers have been replaced by rocker arms fitted with a bearing for making contact with the cams; they are known as ROLLER ROCKER ARMS .

WARNING : avoid direct contact between hands and rocker bearing tracks .



ADJUSTING SCREW

- (1) Rockers.
- (2) Bolt(s) M9.
- (3) Bolt(s) M6.

The adjusting bolts have been modified: the M6 (3) bolts are gradually replaced with bolts .

19-Refitting Rockers

Remontar os Comandos de Varetas

REMOVAL



Remove :

- the battery
- the air cleaner assembly (1)
- the cylinder head cover (2)
- the deflector plate
- the top timing cover (3)

Move aside the injection ECU and its bracket .

POWER STEERING



Remove the bolts (4).



ALL MODELS

Unscrew all the adjusting bolts (5) to their limit .

Position the engine so that no rocker is under stress on a cam (or so that the stresses are minimal).

NOTE : the rocker(s) to be removed must be opposite a cam back .



Remove :

- the stud (6)
- the stop bolt (7)



Remove the spring ring (8).



Push back the shaft (9) until the rocker(s) to be removed are released, use a tube with an external diameter of 19 mm maximum (e.g. size 13 or 14 long radio socket).

WARNING : during this operation, take care not to damage either the shaft, or the sealing inserts at the end of the shaft .


Remove :

- the spring (10) and cup (11) assembly
- the rocker (12)

WARNING : avoid knocks to the rocker bearings when the rail is handled .

WARNING : avoid direct contact between hands and rocker bearing tracks .

REFITTING

WARNING : avoid direct contact between hands and rocker bearing tracks ; apply a light film of clean engine oil to the bearing tracks and to the rocker shaft when the rail is fitted ; check that there is no hard spot on the rocker bearings.

Position :

- the rocker
- the spring and cup assembly



Fit the shaft (9) carefully aligning the holes (a)-(b).

Fit :

- the stop bolt (7) •
- the stud (6) •
- the circlip (8) •

Adjust the valve clearances .

Fit :

- •
- the top timing cover (3) the cylinder head cover (2) •
- the air cleaner assembly (1) •
- the battery •

POWER STEERING

Fit : The securing bolts (4)

20-Cylinder Head Tightening Torque

Torque de Aperto do Cabeçote

CYLINDER HEAD

1st generation.



Ground cylinder heads are marked with a letter (R) engraved at (B).

The cylinder heads specific to the TU1M+ engines are marked at (C) with a mark (M+) when they are cast (on each side) .

The cylinder heads machined to the new dimensions are marked by countersinking (E) of b 10 mm and depth 1.5 mm around the sling bracket mounting hole .

2nd generation .



The cylinder heads of the 2nd generation engines are specific; they can be identified by the boss (1) for the mounting of the compact coil unit .

CYLINDER HEAD GASKET



(1B) Nominal dimension.

(1C) Repair size.

engine code	HFY HFZ	KFX K6C	NFZ
engine type	TU1JP	TU3JP	TU1JP
special features	without	without	without
engine identification (group 1A)	without	without	without

nominal dimension (group 1B)	E	E	E - H
repair size (group 1C)	E - M	E - M	E - H - M

CYLINDER HEAD BOLT



Length under head of bolt (X) .





	on engines with aluminium cylinder blocks, the diameter (D) has been standardised to 19.65 mm from the following engine numbers		
TU9	2197277		
TU1	2581370		
TU3	2252655		

DATA

engine code	HFY HFZ	KFX K6C	NFZ
engine type	TU1JP	TU3JP	TU5JP
special features	Without	without	without
type of cylinder head gasket	Fibre	fibre	fibre
theoretical thickness (mm)	UNK.	UNK.	UNK.
repair dimensions (mm)	UNK.	UNK.	UNK.
bolt length (mm) (mm) (X) nominal	175.5 ± 0.5	175.5 ± 0.5	175.5 ± 0.5
bolt length (mm) (mm) (X) max.	176.5	176.5	176.5
maximum cylinder head bow (mm)	0.05	0.05	0.05

TIGHTENING TORQUE(S)



engine code	HFY HFZ	KFX K6C	NFZ
engine type	TU1JP	TU3JP	TU5JP
special features	without	without	without
pre-tightening (da.Nm) (a)	N/A	N/A	N/A
repair dimensions (a)	N/A	N/A	N/A
tightening (da.Nm) (a)	2	2	2
1st angular tightening (a)	240°	240°	120°
2nd angular tightening (a)	N/A	N/A	120°
3rd angular tightening (a)	N/A	N/A	N/A

21-Cylinder Head

Cabeçote

REMOVAL

Disconnect the battery .

drain the cooling system .

remove the ancillary drive belt .



Remove :

• the air inlet neck (1)

POWER STEERING

Move aside the power steering pump (2).

ALL MODELS

Disconnect the crankcase breather hose (3).

Disconnect the pipes and harnesses attached to the cylinder head .

Remove the accelerator cable .

TU3JP ENGINE



Remove the engine suspension tie bars (4).

TU1JP ENGINE



Without removing the securing bolt(s) on the cylinder head, pull the bar (4) towards the exhaust manifold .

ALL MODELS

Disconnect the front exhaust pipe from the manifold and from the clutch housing .



Peg the flywheel using the rod [5].



Remove :

- •
- the timing belt the cylinder head cover (6) the two spacers (7) the deflector plate (8) •
- •
- •



Immobilise the camshaft gear with tool [7].

Slacken the bolt (9).

Remove ; The camshaft gear .

Starting at the outside and working in a spiral sequence progressively slacken the cylinder head bolts .

Remove :

- the cylinder head bolts
- the rocker shaft

WARNING : avoid knocks to the rocker bearings when the rail is handled .



Rock and free the cylinder head using levers [4].

Remove the cylinder head and gasket .

TU1JP ENGINE



Fit the liner retaining clamps [1] with the bolts [2].

ALL MODELS

Clean the joint faces with an approved descaling product .

The joint faces must not have any trace of knocks or scores .

REFITTING

CHECKING THE FLATNESS



Maximum permissible bow = 0,05 mm.

CHECKING CYLINDER HEAD BOLTS BEFORE RE-USE



Y = Maximum length below head : 176,5 mm.

Replace the oil seal using tool [6].

Fit the camshaft gear .

Tightening torque 8 da.Nm ; Using the tool [7].

Check that the camshaft turns freely in its bearings.



Fit the cylinder head with the camshaft gear pinned [3].

Position 1 and 4 pistons at TDC.

Remove the liner retaining clamps [1].

Clean the threads of the cylinder head bolts in the cylinder block using a thread cutter M10 x 150 .



Check that the two centralising dowels are fitted at (4) and (5).

Fit a new cylinder head gasket, with the maker's name to the top.

Fit : The rocker shaft .

WARNING : avoid touching the roller rocker tracks ; apply a light film of clean engine oil to the bearing tracks and to the rocker shaft when the rail is fitted ; check that there is no hard spot on the rocker bearings.

Fit : The cylinder head bolts pre-coated with engine oil .



tighten the cylinder head bolts in the order shown.

refit the timing belt.

adjust the valve clearances .

Couple up and clip the harnesses, hoses and cables connected to the cylinder head .

fill and bleed the cooling syst

22-Connection Rods ID

Dados das Bielas

DATA IDENTIFICATION CONNECTING RODS

ENGINES - 1ST GENERATION



engines					
	1	- st Generation			
engine type	TU9	TU1 - TU2.4	TU2J2	TU3	TU5
distance (mm)	Nominal				
ø A + 0,016 + 0	41,128	48,655			
ø B + 0,017 + 0	17,939	19,463			
C ± 0,07	122,8	112,3	133,5	126,8	133,5

NOTE : the connecting rods of the 1st generation TU5 engines are carried over to the 2nd generation .

ENGINES - 2ND GENERATION



The new connecting rod is fitted with an oil jet (1) for spraying the underneath of the piston .

The connecting rod is fitted with a new drilled half shell .

23-Pistons ID

Identificação dos Pistões

PISTONS



Reference (A) : R1 For repair dimension pistons .

Reference (B) : Marking towards the timing gear .

Reference (C) : Identification of pistons .

Reference (D) : Category identification for matching with the liner (3 grades) .

WARNING : the pistons are supplied fitted with their gudgeon pin; as the two components are matched, do not mix the pistons and the gudgeon pins .

engines			
Ist Generationengine typeTU9TU1TU2 - TU3 (except TU3F - TU3J2)			
distance (mm)	engines : aluminium cylinder block		
ø E	69,94 to	71,94 to	74,95 to 74,96
category A	69,95	71,95	
ø E	69,95 to	71,95 to	74,96 to 74,97
category B	69,96	71,96	
ø E	69,96 to	71,96 to	74,97 to 74,98
category C	69,97	71,97	

F	58	$64,05 \pm 0,15$	$64 \pm 0,05$
G	11	13	10

engine type	TU3F - TU3J2	TU5	
distance (mm)	engines : cast-iron cylinder block		
ø E nominal	74,96	78,455 + 0,015 + 0	
ø E repair 1	75,36	78,855 + 0,015 + 0	
F	$64 \pm 0,05$	57,5	
G	11		

	engines			
	-			
	2nd Gener	ation	1	
engine type	TU1/K	TU1M+	TU1JP	
distance (mm)	engines : alumi	nium cylinder bl	ock	
ø E category A	71,95 to 71,959			
ø E category B	71,960 to 71,969			
ø E category C	71,970 to 71,980			
F	$47,5 \pm 0,15$			
G	8			
reference (C)	1Z 1X 1Y			

engine type	TU3JP/L3	TU3JP/K	TU3JP/tax incentive L4	
distance (mm)	engines : aluminium cylinder block			
ø E category A	74,95 to 74,9	74,95 to 74,959		
ø E category B	74,960 to 74,969			
ø E category C	74,970 to 74,980			
F	49,75 ± 0,15			
G	8			
reference (C)	3Y	3Z	3X	

engines		
- 2nd Ceneration		
engine type TU5JP		
distance (mm)	-	
ø E nominal	78,455 + 0,015 + 0	
ø E repair 1	78,855 + 0,015 + 0	
F	57,5	
G	11	
reference (C)	JP+	

PISTON RINGS



- (1) Compression ring (No direction of fitting).
- (2) Sealing ring (Identification TOP towards the top).
- (3) Scraper ring (No direction of fitting).

The 2nd generation engines benefit from new piston rings (Not TU5) :

- colour identification, TU1 engines : orange
- colour identification, TU3 engines : mauve

24-Cranckshaft ID

Dados do Virabrequim

Focused on aluminium engine blocks



Cast iron crankshaft with 5 main bearings and balance weights .



(1) Half bearing thrust washers to control end float .

The bearing half-shells (2) and (4) are grooved .

2 - DATA

2 - 1 - CRANKSHAFT



TU1 engine TU2 engine TU3 engine TU5 engine				
	nominal	repair 1	repair 2	repair 3
ø A + 0 - 0,016	49,981	49,681	-	-
ø B - 0,009 - 0,025	45	44,7	-	-
C + 0,052 + 0	23,6	23,8	23,9	24
ø D + 0 - 0,065	85	84,8	-	-

	TU9 engine				
	nominal	repair 1	repair 2	repair 3	
ø A + 0 - 0,016	49,981	49,681	-	-	
ø B ± 0,008	38	37,7	-	-	

C + 0,052 + 0	23,6	23,8	23,9	24
ø D + 0 - 0,065	85	84,8	-	-

IMPERATIVE : lap (depending on engine) and buff following grinding of the crank pins and main journals .

WARNING : reworking of the crankshafts is prohibited.

When carrying out grinding operations, the crankshaft must turn according to its normal direction of rotation in the engine .

Crankshaft end float :

• the crankshaft end float controlled by bearing no. 2 must be between 0.07 and 0.27 mm

	nominal dimension					
Category	Α	B	С	D	E	G
E (mm)	1,823	1,829	1,835	1,841	1,847	1,853
F (mm)	-					
Mark	blue	orange	Black	yellow	green	white

BEARING CAP SHELLS

repair size						
Category	U (*)	V (*)	W (*)	X (*)	Y (*)	Z (*)
E (mm)	1,973	1,979	1,985	1,991	1,998	2,003
F (mm)						
Mark	blue	orange	Black	yellow	green	white
(*) letter (R) stamped on back of shell						

CYLINDER BLOCK SHELLS

	nominal dimension	repair size
1		-

category	С	W (*)	
E (mm)	-		
F (mm)	1,835	1,985	
Mark	Black		
(*) letter (R) stamped on back of shell			

CONNECTING ROD HALF SHELLS

TU9 engine				
distance (mm) nominal repair 1				
Н	1,545	1,695		

TU1 - TU2 engine TU3 engine - not TU3JP TU5 engine					
distance (mm)	distance (mm) nominal repair 1				
Н 1,817 1,967					

IMPERATIVE : combine drilled connecting rod half shells with engines fitted with connecting rods with an oil jet .

NOTE : drilled connecting rod half shells can be combined with connecting rods which do not have an oil jet .



IMPERATIVE: when positioning the piston on the support [2], position the surface with the boss (C) upwards.

Position the piston on the support [2] and guide it using the assembly of handle, pin, guide end piece .

Insert the pin (D).

Screw the pressure screws (B) into contact with the piston .

Tighten the nuts (E).



Remove the pin (D).

Lock the piston .

Place the connecting rod with its cap (without shells) in the piston and centralise it with the handle/gudgeon pin end piece assembly .

Adjust the connecting rod support (F) position and height to obtain :

- the contact of the support (F) under the connecting rod
- play (J) : 0.1 mm

Tighten the lock nut (G).

Remove the connecting rod .



Place the connecting rods on an electric heater .

Place a scrap of tin solder (H) on each little end .

Heat until the solder melts (a temperature of 250 degrees C).

IMPERATIVE : oil the gudgeon pins .



WARNING : the success of the operations depends on this being done quickly : the pin must be fitted in a single movement.

Clean off the blob of solder .

Marking arrow (DT) on the piston pointing upwards :

• place the connecting rod in the piston, the bearing shell stops (I) positioned as shown in the diagram

Marking arrow (DT) on the piston facing downwards :

• place the connecting rod in the piston, shell bearing stops (I) to the right in relation to the gudgeon pin

NOTE : in the engine, the shell bearing stops (I) are located on the inlet side .

Rapidly insert the gudgeon pin fully home .

Wait a few seconds before removing the connecting rod/piston assembly .

Proceed in the same way for the other three assemblies .

2 - 1 - CONNECTING ROD WITH A LUBRICATION HOLE



In the engine, the lubrication hole (K) is on the inlet side .

The lubrication hole (K) is located on the same side as the shell bearing stops (I) .

26-Finding the Correct Bearing Shell

Identificando a Bronzina Correta

ENGINE IDENTIFICATION



Zone A :

- code reference letters (five letters to identify the shells to be fitted)
- the first letter indicates no.1 bearing
- the arrow indicates the timing gear end

Zone B :

• bar code used in plant

If you do not find the sticker in the cranckshaft, the next pages will show how to identify the engine with this red background red colour

IDENTIFICATION (HALF SHELLS)



A paint mark at (C) identifies the grade .

CAST-IRON CYLINDER BLOCK



Category (A) : Blue marking .

Category (B) : Black identification mark .

Category (C) : Green marking .

Half shells, Bearing cap.

Example : if the first crankshaft letter is (S) and the cylinder block (E) :

• the half shell on the main bearing cap no. 1 side will be of grade (A) (colour : blue)

Cylinder block shells :

• the half shell on the cylinder block side will always be grade (B) (colour : black)

original size				
half shell grades : original size bearing cap shells				ells
half shells (reference)	smooth (black) grooved (black)	smooth (blue) grooved (blue)	smooth (black) grooved (black)	smooth (green) grooved (green)

category	В	А	В	С
thickness	1,858 mm	1,844 mm	1,858 mm	1,869 mm

IMPERATIVE : the half shells must be fitted in the correct locations .

Bearings 1 - 3 - 5 = smooth shells (cylinder block and bearing caps).

Bearings 2 - 4 = grooved shells (cylinder block and bearing caps).

repair size					
	cylinder block shells bearing cap shells				
half shells (reference)	smooth (black) grooved (black)	smooth (blue)smooth (black)smooth (green grooved (blue)grooved (blue)grooved (black)grooved (green			
category	Y(*)	Z(*)	Y(*)	X(*)	
thickness	2,008 mm	1,994 mm	2,008 mm	2,019 mm	
(*)-letter (R) stamped on back of shell					

ALUMINIUM CYLINDER BLOCK



Category (A) : Reference - Blue .

- Category (B) : Reference Blue .
- Category (C) : Reference Black .
- Category (D) : Reference Yellow .
- Category (E) : Reference Green .

Category (G) : Reference - White .

Cylinder block shells :

• the half shell on the cylinder block side will always be grade (C) (colour : black)

Bearing cap : Example : if the first crankshaft letter is (S) and the cylinder block (E) :

• the half shell on the main bearing cap no. 1 side will be of grade (B) (colour : orange)

original size									
		bea	cylinder block shells						
category	Α	B	C	D	E	G	С		
thickness	1,823	1,829	1,835	1,841	1,847	1,853	1,835		
mark	Blue	orange	black	yellow	green	white	black		

IMPERATIVE : the half shells must be fitted in the correct locations .

Bearings 1 - 3 - 5 = smooth shells (cylinder block and bearing caps).

Bearings 2 - 4 = grooved shells (cylinder block and bearing caps).

repair size								
	bear	ring cap	shells	cylinder block shells				
category	U(*)	W(*)	Y(*)	W(*)				
thickness	1,973	1,985	1,998	1,985				
mark	blue	black	green	black				
(*)-letter (R) stamped on back of shell								

No identification markings:

When the crankshaft or cylinder block have no identification markings, use PLASTIGAGE type plastic gauge .

1 - MATCHING USING PLASTIC GAUGES

Clean :

- the crankshaft
- the bearing caps

• the half shells

ALUMINIUM CYLINDER BLOCK

Fit the (W) grade (black) or half shells of repair dimension on each bearing on the cylinder block side (observe the position of the smooth and grooved half shells).

Fit the crankshaft .

Fit grade (U) (blue) or half shells of repair dimension on each bearing cap .



Cut lengths of plastic gauge to the width of the shells .

Open the envelope and extract the plastic threads .



Position the plastic threads on the crankshaft journals .

Fit the bearing caps .

Tighten the bearing bolts to 2 da.Nm + 44 $^{\circ}$.

IMPERATIVE : the crankshaft must not be turned during this operation .



Remove the cap assembly .

Compare the width of the flattened plastigage at its widest point with the graduations on the envelope (scale in mm).

The value read indicates the running clearance .

NOTE : the measurement may be made on the crankshaft or the shell depending on the adhesion of the bearing surface .

grade of shell for each bearing								
operating clearance	category	Colour	clearance obtained					
0,01 to 0,027	A (U*)	Blue						
0,028 to 0,039	C (W*)	Black	0,01 to 0,036					
0,04 to 0,054	E (Y*)	Green						
(*) grades of repair dimension half shells								

Having selected the shells, check the main bearing running clearance with the PLASTIGAGE gauge .

After checking, clean marks left by the plastic gauge, and oil the crankshaft .

Tighten the bearing bolts to 2 da.Nm + 44° .

CAST-IRON CYLINDER BLOCK

Fit the (Y) grade (black) or half shells of repair dimension on each bearing on the cylinder block side (observe the position of the smooth and grooved half shells).

Fit the crankshaft .

Fit grade (Z) (blue) or half shells of repair dimension on each bearing cap .



Cut lengths of plastic gauge to the width of the shells .

Open the envelope and extract the plastic threads .



Position the plastic threads on the crankshaft journals .

Fit the bearing caps .
PISTONS, RODS AND CRANCKSHAFT

Tighten the bearing bolts to 2 da.Nm + 49 $^\circ$.

IMPERATIVE : the crankshaft must not be turned during this operation .



Remove the cap assembly .

Compare the width of the flattened plastigage at its widest point with the graduations on the envelope (scale in mm).

The value read indicates the running clearance .

NOTE : the measurement may be n	ade on th	e crankshaft	or the	shell a	depending	on ti	he
adhesion of the bearing surface .							

grade of shell for each bearing						
operating clearance	category	Colour	clearance obtained			
0,025 mm	A (Z*)	Blue				
0,038 mm	B (Y*)	Black	0,01 to 0,036			
0,051 to 0,076 mm	C (X*)	Green				
(*) grades of repair dimension half shells						

Having selected the shells, check the main bearing running clearance with the PLASTIGAGE gauge .

After checking, clean marks left by the plastic gauge, and oil the crankshaft .

Tighten the bearing bolts to 2 da.Nm + 49° .

PISTONS, RODS AND CRANCKSHAFT

27-Crankshaft Seals

Selante do Virabrequim

EARLIER ASSEMBLY



(1) The bolt (Part No. 0516.49) + The washer (Part No. 6949.07).

- (2) Timing gear (Part No. 0513.55).
- (3) Spacer (Part No. 0512.18).
- (4) The oil pump gear (Part No. 0513.45).
- (5) Oil seal (Part No. 0514.72).

Tightening torque of bolt (1) : 10 da.Nm .

LATER ASSEMBLY

PISTONS, RODS AND CRANCKSHAFT

- (6) The bolt (Part No. 0516.60) + The washer (Part No. 6949.07).
- (7) Timing gear (Part No. 0513.84).
- (8) The oil pump gear (Part No. 0513.83).
- (9) Oil seal (Part No. 0514.72).

Tightening torque of bolt (6) : 7 da.Nm + 35° .



Tightening torque of bolt (10) : 7 da.Nm + 40° .



NOTE : the current cylinder heads are provided with a setting hole dia. 10(B) on boss (A).

NOTE : it is possible, with the new assembly for the crankshaft front end, to have cylinder heads with an additional boss at (C), with or without a 8 dia. hole; this additional boss has no effect on the other modifications

28-Checking Cylinder Block Liner Protusion

Checando Alinhamento do Bloco do Motor

The liner protrusion check is carried out by fitting the liners directly into the cylinder block without fitting the seals. DESIGNED FOR ALUMINION CYLINDER BLOCKS

The protrusion is obtained from the machining dimensions .



SPECIAL TOOLS

CHECK THAT THE LINERS ARE FLAT



Set the dial gauge to zero .

Carry out a check at four points on the liner .

The difference must not exceed 0.03 mm; if it does, eliminate the cause .

CHECKING THE DIFFERENCE IN LEVEL BETWEEN THE LINERS



Measure the protrusion of both liners at points (1) and (2).

The difference must not exceed 0.05 mm; if it does, eliminate the cause .

CHECKING THE LINER PROTRUSION IN RELATION TO THE CYLINDER BLOCK

Check the flatness of the cylinder block .



At three points, check the protrusion of each liner in relation to the cylinder block .

The liner protrusion should be between 0.03 and 0.10 $\rm mm$.

29-Reassembly Cylinder Head Engine

Remontar Cabeçote do Motor

Measure the length (X) of the cylinder head bolts .

IMPERATIVE : the length x must be less than 176,5 mm .

Brush the threads of the cylinder head bolts .

Apply clean engine oil to the thread and under the head of the bolts .

REASSEMBLY

Clean the cylinder head bolt threads in the cylinder block using a tap .

Check that the pins (1) are present.

Turn the crankshaft and set it using the tool [1].

Aluminium cylinder block : Remove the liner retaining clamps [2].

Fit the cylinder head gasket (2) with the inscriptions on the cylinder head side .



Position the camshaft pulley (3) without tightening it .

Position the camshaft rod [3].



Fit :

- the cylinder head (4)
- the rocker arm assembly (6) ensuring that the dowels are present and correctly positioned

NOTE : slide rockers : lubricate the cams and the rocker arm pads .

WARNING : roller rockers : avoid direct contact between hands and rocker bearing tracks, apply a light film of clean engine oil to the bearing tracks and to the rocker shaft when the rail is fitted, check that there is no hard spot on the rocker bearings.



• the cylinder head bolts

IMPERATIVE : tighten the cylinder head bolts in the order shown .

Refit the roller tensioner (7).

Fit the nut (8) finger tight (tensioner in minimum position).

Fit a new timing belt.

Fit the belt, the right way round, with run (A) taut, in the following order :

- crankshaft
- camshaft
- coolant pump
- roller tensioner

Turn the roller tensioner anti-clockwise to tension the belt (A) lightly .

Tighten the nut (8).

Remove the timing tools [1], [3].

Turn the crankshaft four revolutions in the normal direction of rotation .

Tighten the bolt (9) to 8 mdaN using the tool [5].



	adjust the v	valve clearances
with valve fully open : exhaust	inlet : 0.20 mm	exhaust : 0.40 mm
1	3	4
3	4	2
4	2	1
2	1	3

30-Reassembling the Engine Block

Remontando o Bloco do Motor

Designed for aluminium engine blocks. May not work on cast iron engines

Place the cylinder block on the stand [1].

Carefully clean the joint face and the cylinder block tappings .



Fit the rings using piston ring pliers :

- (2) compression ring
- (3) tapered sealing ring
- (4) scraper ring with its spring

Fit with the TOP mark upward .

Position the ring gaps at 120 degrees to the scraper ring gap.



Oil the pistons.

Fit the ring collar.

Moderately tighten .



Position the piston on the liner to obtain on fitting :

- the alignment of the liner/cylinder block marks
- the direction of the piston arrow on the timing side

Push the piston in the liner until the collar is freed .

Proceed in the same way for the other three assemblies .



Fit a new seal (6) to each liner taking care not to twist it .

Fit : CONNECTING ROD HALF SHELLS .



Fit the liners/con rods/pistons assemblies in the cylinder block following the positioning marks made during removal or during the liner protrusion check .

Position the liner retaining clamps [4].



Fit; Cylinder block side :

• the bearing half-shells (7)

NOTE : MATCHING OF MAIN BEARING SHELLS .

IMPERATIVE : ensure the half shells are fitted correctly.

Bearings 1 - 3 - 5 = smooth shells (cylinder block and bearing caps).

Bearings 2 - 4 = grooved shells (cylinder block and bearing caps).

Oil the half shells and the journals .



Position :

- the crankshaft (8)
- the side stop thrust washers (9), grooved surface in contact with the crankshaft

Position a dial gauge on the end of the crankshaft using tools [2] - [3].

Push the crankshaft in one direction until it reaches the limit of its travel .

Set the dial gauge to zero .

Push the crankcase in the opposite direction until it reaches the limit of its travel .

The end float should be 0.07 to 0.27 $\rm mm$.

CORRECT THE END FLOAT BY CHANGING THE HALF THRUST WASHERS (9).



Lubricate and fit the con rod half-shells .

WARNING : there is a correct way round for the big end caps to be fitted; the notches (A) of the big end caps half-shells must be opposite the notches of the big end half-shells.

Fit :

• the big end caps (11)

IMPERATIVE : always fit new connecting rod cap nuts .

Tighten the connecting rod cap nuts to the correct torque : 3.8 da.Nm .



Fit :

- the cotter (18)
- the oil pump chain (19) and gear (20) assembly



Fit the main bearing cap casting (21) with its half-shells (grooved on bearings 2 and 4).

Oil the main bearing shells .

Check that the centralising dowels are present on the cylinder block .

NOTE : MATCHING OF MAIN BEARING SHELLS .

Coat the joint face with a thin, even layer of jointing compound (E10) .



Position the main bearing cap casting (21).

Tighten the bolts (22) to 2 daN.m + 44° (Proceeding in a spiral direction starting at the centre)

Tighten the bolts (23) to 0.8 daN.m.

.



Check that pin (12) is present.

Refit the oil pump.

Tighten the securing bolts to 0.9 da.Nm .



Coat the joint face with a thin, even layer of jointing compound (E10) .

Fit the sump.

Tighten the securing bolts to 0.8 da.Nm .



WARNING : remove the traces of sealing compound before refitting the crankshaft seal (flywheel end).

Fit a new lip seal (24) using tool [5] (Flywheel end).

Fit the oil gallery plug (25) and tighten it to 3 m.daN.



Refit the flywheel.

Coat the flywheel bolt threads with LOCTITE FRENBLOC .

Fit the stop [6].

Tighten the bolts to 6.7 da.Nm.

Fit a new lip seal (26) using tool [7] (Timing gear end).

Fit the oil seal against its shoulder by means of the bolt (27).



Check that the cotter (28) is fitted.

Apply a thin coat of (E15) compound to the join between the spacer and the crankshaft and cotter .

Fit the spacer (29).

Fit the timing gear (30).

Fit the bolt (31) and its washer.

Tighten the bolt (31) to 10 da.Nm.

NOTE : ensure there are no traces of sealant on the timing gear.

Remove the stop [6].



Fit the pump (32) using a new seal.

Tighten the bolts to 1.8 da.Nm .



Ensure that the seal (33) and the dowels (34) are present .

Fit the water pump assembly (32).

Tighten the bolts :

- M10 : 6.5 da.Nm
- M8 : 3 da.Nm



Turn the crankshaft and set it using the tool [8] .

Fit the centralising pins (35).

<u>31-Reassembly the Engine Dress</u>

Remontar os Acessórios do Motor

REASSEMBLY



Fit :

• the timing covers (1)

Tighten the bolts (0.8) to daN.m.



IMPERATIVE : the later stainless steel gasket has pressings at (A) round the gas passage openings, the domed side of the stainless steel gasket must be fitted towards the exhaust manifold.

Fit :

- the (3) exhaust manifold gaskets
- the exhaust manifold (4)

WARNING : there are 2 types of exhaust manifold securing nut.

(5)Short nut :

• tightening torque : 2.5 da.Nm

(6) Long nut :

• tightening torque : 1.6 da.Nm



Check that the components of the injection rail are positioned correctly and that the injector O-rings are in good condition .

Fit :

• the injection pipe (11)

Tighten the bolts (0.7) to daN.m .

Fit new rubber joints to the inlet manifold .

Fit :

• the inlet manifold (12)

Tighten the bolts (0.8) to daN.m.

Check that the injection rail/manifold connection is positioned correctly .

Tightening torque 0.8 da.Nm .



Fit :

• the coolant temperature sensor (13)

Tightening torque 2.5 da.Nm .

Fitting (B) :

• coat the surfaces of the coolant outlet housing with a thin layer of silicon paste (E10)

Fitting (C) :

- fit a new thermostat in the thermostat housing, check that the sealing joint is present
- coat the surfaces of the two housings with a thin layer of silicon compound (E10)

Fit :

• the unit (14)

Tighten the bolts to 0.8 da.Nm .

Water outlet housing (Fitting (B)).

There are various coolant outlet end pieces with an integral thermostat .

IMPERATIVE : fit a new coolant outlet end piece to the coolant outlet housing - check that the sealing joint is present .

Tightening torque 0.8 da.Nm .



(14) Water outlet housing.

(15) Straight coolant outlet end piece (According to vehicle).

(16) Angled coolant outlet end piece (According to vehicle).

IMPERATIVE: the coolant outlet housings (E) equipped with a type heater matrix take-off must be fitted with a coolant outlet end piece equipped with a type lug.



The coolant outlet housings (G) equipped with a type heater matrix take-off must be fitted with a coolant outlet end piece equipped with a type lug.



Fit :

- the lifting plates (17)
- tighten the bolts to 3 da.Nm

Fit :

- the spark plugs (tightening torque 2.8 da.Nm)
- the compact coil unit (18) (depending on engine)

Tighten the bolts to 0.8 da.Nm .

Fit :

• the cowling and the coil (19) (depending on engine)

Tighten the bolts to 0.5 da.Nm + .

Fit :

• the knock sensor (20)

Tightening torque 2 da.Nm .



Fit :

• the heat shield (21)

Tighten the bolts to 0.8 da.Nm .

Fit the dipstick tube (22) (seal to the cylinder block with RECTIJOINT adhesive paste) .

Fit :

• the dipstick (23)

Fit :

• the electric gauge (24) (according to specification)

Tightening torque 2.7 da.Nm .

Fit :

- the heat exchanger (25) (according to specification)
- the nipple (26) (according to specification)

Tightening torque 0.8 da.Nm + .

Fit :

- a new oil filter (27)
- the oil pressure switch (28)

Tightening torque 2.5 da.Nm .



Fit :

- the deflector plate (29)
- the two spacers (30)
- the cylinder head cover (31) with a new joint

Cylinder head cover with 8 mm diameter securing hole .

Fit new sealing washers under the nuts .

Tightening torque 1.6 da.Nm.

Cylinder head cover with 6 mm diameter securing hole .



The new cylinder head covers can be identified by their securing hole diameter of 8 instead of .

The new studs are stepped, diameter 6 X 8.

The new blind nuts have integral seals.

Tightening torque 0.7 da.Nm.

32-Refitting Timing Bell

Remontar Polia de Sincronia

TU ENGINE

Remove : The engine suspension tie bars .

TU1JP ENGINE



Without removing the securing bolt(s) on the cylinder head, pull the bar (8) towards the exhaust manifold .

TU ENGINE

Remove the ancillary drive belt .

Move aside :

- the injection-ignition control unit
- the control unit bracket



Remove :

- the crankshaft pulley
- the timing covers

TU5JP ENGINE AL4 AUTOMATIC GEARBOX

Move the camshaft pulley close to the setting point by rotating in the normal direction of rotation .

ALL MODELS

Peg the flywheel using the rod [2].

Peg the camshaft gear using the rod [3].

TU ENGINE



Slacken the nut (4) retaining the roller tensioner (5) to slacken the belt (6).

Remove the timing belt (6).

REFITTING

TU ENGINE

Flywheel and camshaft gear pegged .



Check that the roller tensioner (5) turns freely (no tight spot).



Fit the timing belt, run (A) well tensioned, in the following order :

- crankshaft
- camshaft
- coolant pump
- roller tensioner

Fit the timing belt, run (A) well tensioned, in the following order :

- crankshaft
- camshaft
- coolant pump
- roller tensioner

TU ENGINE



Position the belt tension measuring equipment [4].

Slacken the nut (4).

TU ENGINE

Turn the roller tensioner (5) anti-clockwise to display 44 SEEM units .

Tighten the nut (4) to 2,2 da.Nm.

Remove :

- the camshaft pulley rod [3]
- the engine flywheel rod [2]
- the belt tension measuring equipment [4]

Turn the crankshaft 4 turn(s) in the direction of running .

Without moving it backwards, set the flywheel.

Ensure that the timing setting is correct (the camshaft pulley can be set).

If this is not the case, restart the timing belt tensioning operation .

Remove the cylinder head cover .


Slacken the bolts (7) :

- position the valve rocker contact plate [1] observing its fitting direction in relation to the timing gear
- tighten the bolts (7) (ensure that all of the cams are free)

WARNING : tighten the bolts (7) to free the cams but do not place the valves in contact with the pistons.

Position the belt tension measuring equipment [4].

Progressively slacken the roller tensioner to achieve a tension value between 29 and 33 SEEM units .Tighten the nut (4) to 2,2 da.Nm .

Remove :

- the valve rocker contact plate [1] without disturbing its setting
- the engine flywheel rod [2]
- the belt tension measuring equipment [4]

Turn the crankshaft 2 turn(s) in the direction of running .

Check that the flywheel and camshaft can still be pegged .

If this is not the case, restart the timing belt tensioning operation .

Fit :

- the timing cover
- the crankshaft pulley
- the ancillary drive belt
- •

33-Routing and Tensioning Drive Belt

Tensionando Polia do Alternador

POWER STEERING AIR CONDITIONING TU ENGINE



[2] Pin (-).0178 C (Dynamic tensioner roller).

ALL MODELS

ANCILLARIES DRIVE BELT ROUTING

WITHOUT AIR CONDITIONING CONVENTIONAL STEERING TU ENGINE



With alternator (Category 7) :

• toothed trapezoid belt

With alternator (From class 8) :

• polyvee belt (6 Vs)

Tension achieved by the position of the alternator .

AIR CONDITIONING TU ENGINE



Polyvee belt (6 Vs).

Tension achieved by the mechanical rack tensioner roller (1).



ALL MODELS

Polyvee belt (6 Vs).

Tension achieved by the mechanical rack tensioner roller (1).



Polyvee belt (6 Vs).

Tension achieved by the dynamic tensioner roller (2).

BELT TENSION

TENSION AT THE ALTERNATOR



Slacken the bolts (3).

Position the belt tension measuring equipment [1].

Turn the bolt (4) to obtain the recommended value .

Tighten the bolts (3) to 3.7 daN.m.

Remove the tool [1].

Turn the engine 3 revolutions .

Check the tension - Adjust the value (if necessary).

Tension values :

- toothed trapezoid belt : 81 SEEM units (67 SEEM units when re-used)
- polyvee belt (6 Vs) : 120 SEEM units (90 SEEM units when re-used)

TENSION USING THE RACK TENSIONER



Slacken the nut (5).

On the run (A), position the belt tensioning equipment [1].

Turn the bolt (6) to raise or lower the tensioner roller and obtain the recommended tension value .

Maintain the tensioner roller in this position .

Tighten the nut (5) to 4.5 da.Nm.

Remove the tool [1].

Turn the engine 3 revolutions .

Check the tension - Adjust the value (if necessary) .

Tension values : 138 SEEM units (103 SEEM units when re-used).

TENSION USING THE DYNAMIC TENSIONER



Turn the square bolt (7) to compress the tension spring until the tool [2] allows immobilisation through the hole (8).

Fit the belt observing the correct routing .

Compress the spring to release the setting rod .

Slowly release the tensioner .

WARNING : when positioning the belt, fit the tensioner roller last .

IMPERATIVE : tightening torque of bolt (9) : 5.7 da.Nm

34-Removing and Refitting Oil Filter

Montando e remontando o filtro de óleo

REMOVAL

WARNING : as draining is carried out when warm, beware of nearby heat sources.



Cover (1).

Tabs (2).

Cover gasket (3).

Filter cartridge (4).

WARNING : be careful to avoid splashes of oil onto the catalytic converter .

Slacken the cover (1).

NOTE : the tabs (2) are designed to hold the cover on a 27 mm pin so that the cover can be removed without burning your hands on the catalytic converter.

Detach the cover and remove it .



Detach the filter from the cover, pull it in the direction of the arrows (A).

Remove the seal (3).

WARNING : take care not to damage the seal groove.

REFITTING

Fit :

- a new seal (3)
- a new filter element

the cover fitted with its filter element ; tightening torque 2.8 da.Nm



35-Removing and Refitting MA Gearbox

Removendo e Remontando Caixa de Câmbio (MA)

Remove :

- the battery cover
- the clamp (3)
- the battery and its tray
- the battery support



Pull the clutch cable to remove it from the clutch lever .



NOTE : *if this is not possible (automatic take-up mechanism jammed) unscrew bolt (4) to create a minimum clearance at the clutch pedal*.



Remove (In the following order) :

- the cable sleeve end piece (5)
- the pad (6)
- the clutch cable from the cable sleeve stop support



Remove :

- the bolt (7)
- the nut (8)
- the connector (9)



Remove :

- the connector (10)
- the bolts (11)
- the bolt (12)



Unclip the connecting rods using tools [1]-[2].

Raise the vehicle .

Remove the drive shafts .



Remove the bolt (13).

Lower the vehicle .



Position : The tools [3], [4], [5], [6].

Hook the gearbox at (B).



Remove :

- the flexible mounting (14) the bracket (15) •
- •



Remove the clip (16).



Remove :

- the bolts (17)
- the gearbox

REFITTING



Check :

- there are no oil leaks at the stop guide (18)
- there are no oil leaks at the crankshaft seal (19)
- the state of wear of the clutch

Replace the differential outlet seals (Refer to the relevant procedure).

Apply a fine coat of MOLYKOTE BR2 PLUS to the clutch stop guide .

NOTE : do not grease the input shaft splines .



Fit :

- the gearbox
- the bolts securing the gearbox to the engine : tightening torque : 4 da.Nm
- the bracket (15) : tightening torque : 2.5 da.Nm
- the flexible mounting (14)
- the nut (20) : tightening torque : 6.5 da.Nm

Relieve the pressure on the flexible shim using the power train support crossmember .

Reposition the flexible shim in contact with its support .

Refit the bolts (21) : Tightening torque : 3 da.Nm .

Remove the tools [3], [4], [5], [6].



Coat the contact surface of the washer with TOTAL N3945 multi-purpose grease at (C) .

Coat the pad (6) at (D) with tyre fitting compound .

IMPERATIVE : do not use grease.

Refit the clutch cable .

Apply and release the clutch several times fully .

Check :

- no points of resistance
- pedal position

Refit the starter motor : Tightening torque : 2.2 da.Nm .

Continue the fitting operations in the reverse order to removal.



Before refitting the air filter, check that the following components are present and positioned correctly :

- seal (E)
- the stop (F)

Drain : The gearbox .



ALL MODELS

Remove :

- the battery (1)
- air inlet/air filter neck unit (2)
- the injection-ignition control unit (3)
- the battery container (4)
- the battery tray
- the accelerator cable (5)
- the engine coolant outlet/radiator inlet pipes



Disconnect :

- the electrical connections (6)
- the inertia switch (7)
- the earth point (8) on the left chassis leg

Remove the clutch cable .



Disconnect the connector (9).



Unclamp the pipes (10) on the bulkhead.

Disconnect the electrical connection (11).

Remove the gearbox controls .



Uncouple the click-on clip (12) on the vacuum take-off for the braking assistance on the inlet manifold .

Lower the pressure in the injector supply pipe by means of the pump [6].

Disconnect the click-on connectors for fuel supply and return on the injection rail .

Remove :

- the front right-hand wheel
- the mud shield (right side)



Disconnect and unclamp the connector on the lambda sensor (13).

Remove :

- the catalytic converter (14)
- the heat shield (15)
- THE DRIVE SHAFTS

POWER STEERING



Remove :

- THE ANCILLARY DRIVE BELT
- the power steering pump fixing bolts
- the heat shield fixing bolts (16)

Move aside the power steering pump without opening the high pressure pipes .

AIR CONDITIONING

Remove the compressor securing bolts .

Move aside the air conditioning compressor without opening the pipes .

Disconnect the connector located under the coolant reservoir .

ALL MODELS



ALL MODELS

Remove the bolt securing the reaction link (17) to the body.

Position the lifting tools [1] - [2] - [3] and switch them on .



Remove :

- the flexible mounting (18) •
- the bracket (19) •

Move aside the gearbox mounting plate (20).



Remove :

- the engine mounting (21) the cooling radiator •
- •

Protect the cooling radiator with stiff cardboard .

Remove the power train from below the vehicle .

3 - REFITTING

IMPERATIVE : always fit new Nyloc nuts .



Use the drifts [4] - [5] to fit the final drive oil seals, having greased the space between the seal lips .



Ensure that the spacer (22) is present.

Grease the inner part of the gearbox flexible mount with grease .

Fit :

• the flexible mounting



36-Dismantling MA Gearbox

Desmontar Caixa de Câmbio (MA)

DISMANTLING GEARBOX



Remove the clutch stop (1).

Place the gearbox on a block of wood (H = 180 mm) (Minimum).

Remove :

- the mounting and the speedometer take-off gear (2)
- the reverse lamp switch (3)
- gearbox drain plug
- filling and level plug
- the final drive output seals



1st fitting, Remove :

- •
- the ball joint lever (4) the clamp (5) the connecting plate (6) •



2nd fitting :

remove the gearbox control relay lever (3)

37-Input Shaft Assembly

"Entrada" da Caixa de Câmbio

ASSEMBLY

WARNING : bearings removed must not be re-used ; lubricate the components as they are refitted ; check that the shaft bearings are in perfect condition, no knock or scratch marks ; observe the matching, the direction of fitting or the relative positions of re-used parts marked on dismantling ; use parts which are clean and free from faults .



Fit the new bearing (4) on the 1st gear side .



Fit the new bearing (3) on the 4th gear side .

NOTE : position the bearing groove (A) upwards.

<u>38-Output Shaft Assembly</u>

"Saída" da Caixa de Câmbio

Remove the bearing (3) using the extractor [1].



Remove :

- the washer (4)
- the 4 speed driven gear (5)
- the synchroniser ring (6) (4 th gear)
- the 3rd/4th synchroniser ring
- the synchroniser ring (8) (3 th gear)

WARNING : do not dismantle the synchroniser (7) to avoid ejection of the balls and springs .



Drift out the stop ring (9) using tool [3].



Remove :

- the 3 speed driven gear (10)
- the stop ring (11)
- the 2 speed driven gear (12)
- the synchroniser ring (13) (2 th gear)
- the 1st/2nd synchroniser (14)
- the synchroniser ring (15) (1st)
- the stop ring (16)
- the 1st speed driven gear (17)
- the stop ring (18)
- the lubrication nipple (19)

WARNING : do not dismantle the synchroniser (14) to avoid ejection of the balls and springs



Remove the bearing (20).

ASSEMBLY

WARNING : bearings removed must not be re-used; lubricate the components as they are refitted; check that the shaft bearings are in perfect condition, no knock or scratch marks; match up the marks made during removal; use parts which are clean and free from faults.



Fit the new bearing (20) using the tool [5] and the distance piece [4].



Fit :

- the new stop ring (18)
- a new plastic lubrication nipple (19)



WARNING : position the lugs (A) on the rings of the fingers (B) of the synchronisers (14) and (7).

Fit :

- the 1st speed driven gear (17)
- the new stop ring (16)
- the synchroniser ring (15) (1st)
- the 1st/2nd synchroniser (14), groove (C) to the bottom

- the synchroniser ring (13) (2nd)
- the 2 speed driven gear (12)
- the new stop ring (11)
- the 3 speed driven gear (10)
- the new stop ring (9)
- the synchroniser ring (8) (3rd)
- the 3rd/4th synchroniser (7), groove (D) to the top
- the synchroniser ring (6) (4th)
- the 4 speed driven gear (5)
- the washer (4)



WARNING : do not press on the lubrication nipple, and do not exceed 2 tonnes against the stop.

Fit the new bearing (3), groove (E) towards the top.

39-Shafts and Forks

Luvas, Eixos e Garfos da Caixa de Câmbio

IDENTIFICATION OF SHAFTS AND FORKS



- (1) Fork : 1st/2nd .
- (2) Fork : 3rd/4th .
- (3) Fork : 5th .
- (4) Reverse fork.
- (5) Reverse fork control relay.
- (6) 3rd/4th fork shaft .
- (7) 5th speed fork and reverse relay shaft .
- (8) Reverse gear brake spring.
- (9) Reverse gear brake spring retaining circlip .
- (A) 1st/2nd fork control lug.
- (B) Reverse fork drive pin.
- (C) 5th speed fork and reverse relay control lug.

STRIPPING THE 1ST/2ND GEAR FORK - REVERSE GEAR RELAY



WARNING : the reverse gear shaft and relay lever are drilled together, their matching must be maintained.

Remove :

- the reverse gear brake spring
- the reverse gear brake spring retaining circlip
- the tension pin

Separate the shaft from the reverse control relay .

REASSEMBLING THE 1ST/2ND GEAR FORK-REVERSE GEAR RELAY



WARNING : the reverse gear shaft and relay lever are drilled together, their matching must be maintained .

Assemble the control relay shaft and the 1st/2nd fork .

Observe the positioning of the control lugs (D) and (E) and the reverse relay (1).

- the new spring pin
- the reverse gear brake spring retaining circlip

the reverse gear brake spring
40-Synchronisers

Sincronizadores/Luvas

CONVENTIONAL SYNCHRONISER : 1ST/2ND



- (1) Sleeve.
- (2) Hub.
- (3) Ball .
- (4) Spring.
- (5) Finger.

IMPROVED 1ST/2ND SYNCHRONISER



(6) Sleeve.

(7) Hub.

(8) Ball .

(9) Finger.

(10) Ball seat.

(11) Spring.

CONVENTIONAL SYNCHRONISER : 3RD/4TH/5TH



(12) Sleeve.

(13) Hub.

(14) Ball.

(15) Spring.

(16) Finger .

DISMANTLING

IMPERATIVE : mark the relative positions of the hub and sleeve if these parts are to be reused.

Separate the sleeve from the hub in a container to facilitate retrieval of the balls, springs and fingers .

ASSEMBLY

CONVENTIONAL SYNCHRONISER : 1ST/2ND



Direction of assembly of the 1st/2nd gear synchroniser, with the groove (A) on the hub directed to the same side as the fork location (B) on the sleeve .



On reassembly, observe :

- the marks made on dismantling
- the relative positions of the notches (C) in the sleeve and (D) in the hub

Assemble the two parts .



For each of the three devices :

- position and support the finger (5)
- insert the spring (4) into the finger and fully into the hub at (D)
- place the ball (3) on the spring
- press on the ball (3) to compress the spring (4) and insert it in the sleeve (1)

IMPROVED 1ST/2ND SYNCHRONISER



Direction of assembly of the 1st/2nd gear synchroniser, with the groove (E) on the hub directed to the same side as the fork location (F) on the sleeve .

Respect the marks made on dismantling .



Position the notch (G) on the hub (7) opposite hole no. 1 of the tool [1].



Position :

• the spring (11)

the ball seat (10)

41-Differential

Diferencial

DIFFERENTIAL : DIAMETER 68 MM



The 68 mm diameter differential has ribs (a) at the rear of the unit .

The 68 mm diameter corresponds to the diameter of the sphere of evolution of the sun gears .

3 - 2 - DIFFERENTIAL : DIAMETER 77 MM



The 77 mm diameter differential does not have any ribs at the rear of the unit .

The 77 mm diameter corresponds to the diameter of the sphere of evolution of the sun gears .

DISMANTLING

DIFFERENTIAL : DIAMETER 68 MM



Remove :

- the differential pinion shaft circlip (1)
- the differential pinion shaft (2)
- the planet wheels (3), turning the sun wheels
- the sun wheels (4)
- the friction shell (5)

4 - 2 - DIFFERENTIAL : DIAMETER 77 MM



Remove :

- the differential pinion shaft circlip (6)
- the differential pinion shaft (7)
- the planet wheels (8), turning the sun wheels
- the friction housings (9)
- the sun wheels (10)
- the sun gear centraliser (11) opposite the crown wheel



Remove the speedometer drive gear (12).



WARNING : maintain the matching of the outer races if the bearings are to be re-used .

Extract the bearings (13).

ASSEMBLY

WARNING : bearings removed must not be re-used.



Fit :

- the new bearings (13)
- a new speedometer drive gear





Fit the friction shell (5), collar (A) on the speedometer gear side .



Fit :

- the sun wheels (4)
- the planet cage (3)

DIFFERENTIAL : DIAMETER 77 MM



Refit the sun gear centralising device (11) in its location, on the opposite side to the crown wheel (bond it using grease).



Fit :

- the sun wheels (10)
- the planet gears (8), with the friction cups (9)



Turn the planet wheels .

Insert the differential pinion shaft (7) through the differential box and the planet cage .

Clip the differential pinion shaft (6) to the differential box .

42-Refitting Input, Output Shaft and Differential

Remontar Entrada, Saída e Diferencial do Câmbio

IMPERATIVE : clean the threads of the clutch housing using a tap, and the threads of the reused bolts using a die .



Fit :

- the differential (1)
- the spring (2)
- the reverse fork locking finger (3)



Coat the contact surface of the intermediate plate (4) and that of the clutch housing with E12 .

Insert the selection fork in the passage (A) in the intermediate plate .

Fit the intermediate plate .

WARNING : unstrengthened gearboxes with the intermediate plate secured in production by 9 bolt(s) must be refitted with 11 bolt(s) in service.

Fit the bolts and tighten them to 5 da.Nm.

WARNING : remove the excess adhesive from the bearing seat and the fork shaft bores after tightening the plate bolts .



Insert the forks in the synchroniser sleeves .

Couple the output shaft with the input shaft .

Fit the assembly into the casing .



Insert the engagement finger (5) in the interlock key (6).



1st fitting :

• fit the assembly by simultaneously engaging the finger in the fork shaft lugs (B) and the frame (C) in the selection shaft fork (D)



2nd fitting :

• refit the assembly by simultaneously engaging the finger on the fork shaft lugs (E)



Fit :

- the spring (7) and its two thrust cups (8) (depending on the fitting)
- the new shaft seal (9), pre-greased on the inside
- the engagement shaft (10)



WARNING : the engagement finger and the shaft are drilled together; their matching must be maintained.

Secure the finger with a new solid ribbed pin (11).



Engage the reverse fork (12) in the yoke.



Press gently on the reverse fork (12) and insert its shaft (13) fully home .



Fit :

- the reverse sliding gear (14)
- the idler shaft (15)
- the plastic spacer (16)

WARNING : rotate the shaft until the step (F) falls into its housing.

IMPERATIVE : on gearboxes fitted with a reverse gear brake, check the presence of the circlip (17) and the reverse brake spring (18) on the 1st/2nd gear fork shaft .

43-Refitting Drive Shafts

Remontar Eixos de Transmissão

REFITTING



Check :

- there is no clearance in the joints (5)
- the condition of the gaiters (6)
- the bearing roller (7)

Rectify (If necessary).

Clean and coat with TOTAL 3945 multi-purpose grease the splines of the hub and of the driveshaft at the wheel end .

Right hand drive shaft :

• clean and coat with TOTAL 3945 multi-purpose grease the outer bush of the bearing roller (7) and its housing in the right-hand lower engine mounting



Replace :

- THE RIGHT-HAND DIFFERENTIAL OUTPUT SEAL (using the tool [36])
- the left-hand differential output seal THE LEFT-HAND DIFFERENTIAL OUTPUT SEAL (using the tool [37])

Remove the adhesive tape .

Refit the driveshaft in the differential.



Right hand drive shaft :

• place the deflector in its groove (C)



<u>Fit :</u>

- <u>the driveshaft in the hub</u>
- the pivot ball joint using tool [28]
- the bolt (4) : tightening torque : 4 da.Nm

Remove the tool [28].



Pre-tighten one bearing nut (5) to 0.5 daN.m.

44-Tightening Torque BE4 Gearbox

Torque de Aperto do Câmbio BE4

1 - IDENTIFICATION



- (1) Control rod (Ball joint ø 10).
- (2) Control relay lever (Ball joint ø 10).
- (3) Selection rod.
- (4) Engagement rod.
- (5) Reaction rod.
- (6) Support plate (Ball joint ø 10).
- (7) Selection lever (Ball joint ø 10).
- (8) Engagement lever (Ball joint ø 13).

TIGHTENING TORQUE(S)

Gear lever to control rod : 0.8 da.Nm .

Relay lever shaft (A) : 3 da.Nm + Loctite .

Support plate fixing (B) to gearbox : 1.5 da.Nm.

Lubricate the shafts and ball joints with ESSO NORVA 275 grease .

IDENTIFICATION



Identification area (A) comprising :

- the component reference serial number •
- •

DATA

engine code	WJZ - WJY	WJZ - WJY	WJZ - WJY
special features	175/70R13	175/65R14	175/70R13
	tyres	tyres	tyres
	20DL12 -	20DL12 -	20DL02 -
unit reference	20DL13 -	20DL13 -	20DL03 -
unit reference	20DL22 -	20DL22 -	20DL24 -
	20DL23	20DL23	20DL25
gearbox type	BE4/5	BE4/5	BE4/5
gearbox ratios ; 1st	11 x 38	11 x 38	11 x 38
gearbox ratios ; 2nd	23 x 43	23 x 43	23 x 43
gearbox ratios ; 3rd	25 x 32	25 x 32	25 x 32
gearbox ratios ; 4th	41 x 39	41 x 39	41 x 39
gearbox ratios ; 5th	47 x 35	47 x 35	47 x 35

gearbox ratios ; reverse	12 x 31 x 40	12 x 31 x 40	12 x 31 x 40
speed at 1000 revs/min (in km/h) ; 1 st	8.55	8.61	8.10
speed at 1000 revs/min (in km/h) ; 2 nd	15.80	15.90	14.96
speed at 1000 revs/min (in km/h) ; 3 rd	23.08	23.23	21.86
speed at 1000 revs/min (in km/h) ; 4 th	31.06	31.26	29.41
speed at 1000 revs/min (in km/h) ; 5 th	39.68	39.92	37.57
speed at 1000 revs/min (in km/h) ; reverse	8.86	8.91	8.38
final drive ratio(s)	17 x 61	17 x 61	19 x 72
speedometer drive	19 x 17	19 x 17	19 x 17
differential diameter	UNK.	UNK.	UNK.
oil capacity ; litre(s)	1.9	1.9	1.9

engine code	WJZ – WJY	WJZ - WJY	WJZ - WJY
special features	175/65R14 tyres	185/55R15 tyres	175/65R14 tyres
unit reference	20DL02 - 20DL03 - 20DL24 - 20DL25	20DL08 - 20DL09	20DL06 - 20DL07
gearbox type	BE4/5	BE4/5	BE4/5
gearbox ratios ; 1st	11 x 38	11 x 38	11 x 38
gearbox ratios ; 2nd	23 x 43	23 x 43	23 x 43
gearbox ratios ; 3rd	25 x 32	25 x 34	27 x 31
gearbox ratios ; 4th	41 x 39	39 x 41	45 x 37
gearbox ratios ; 5th	47 x 35	43 x 37	47 x 31

gearbox ratios ; reverse	12 x 31 x 40	12 x 31 x 40	12 x 31 x 40
speed at 1000 revs/min (in km/h) ; 1 st	8.15	8.16	8.38
speed at 1000 revs/min (in km/h) ; 2 nd	15.06	15.08	15.49
speed at 1000 revs/min (in km/h) ; 3 rd	21.99	23.73	25.22
speed at 1000 revs/min (in km/h) ; 4 th	29.60	26.82	35.22
speed at 1000 revs/min (in km/h) ; 5 th	37.80	32.77	43.90
speed at 1000 revs/min (in km/h) ; reverse	8.45	8.45	8.69
final drive ratio(s)	19 x 72	19 x 72	19 x 70
speedometer drive	19 x 17	22 x 18	19 x 17
differential diameter	UNK.	UNK.	UNK.
oil capacity ; litre(s)	1.9	1.9	1.9

TIGHTENING TORQUE(S)



engine code	
special features	without
(2) gearbox rear casing	1.25
(3) securing the gearbox casing to the clutch housing	1.25
(4) reverse gear rocking shaft securing nut	4.5
(5) breather	1.5
(6) reverse lamp switch	2.5
(7) drain plug	3.5
(8) level plug	2.2
(9) speedometer drive support	
(10) differential housing fastener	
(11) differential housing fastener	
(12) thrust bearing guide fastening	
(13) differential extension fastener	
(14) stop plate fastener	N/A
(15) gearbox mounting on crankcase	5.5



engine code	da.Nm
special features	without
(20) input shaft nut	7.25
(21) output shaft nut	6.5
(22) bearing retaining bolt	1.5
(23) gearbox control bracket bolts	1.5
(24) differential crown wheel fastener	6
(25) fork securing bolts	N/A

45- Reassembly Gearbox

Remontar Caixa de Câmbio



Use the drifts [4] - [5] to fit the final drive oil seals, having greased the space between the seal lips .



Ensure that the spacer (22) is present.

Grease the inner part of the gearbox flexible mount with grease .

Fit :

- the flexible mounting
- the right-hand engine mounting (21)

AIR CONDITIONING

When refitting the compressor, tighten the securing bolts on the pulley side first .

ALL MODELS

REFIT THE DRIVE SHAFTS .

Fill the engine oil and check the level .

Check the cooling system for leaks .

Connect the battery.

FILL AND BLEED THE COOLING SYSTEM .

FIT THE ANCILLARY DRIVE BELT .

Continue the fitting operations in the reverse order to removal.

Turn on the ignition for 10 seconds .

46-Assembly MA Gearbox

Montar Caixa de Câmbio MA

ASSEMBLY



Place the gearbox on a block of wood (H = 180 mm).

Fit :

- the speedometer pinion (1)
- the reverse lamp switch (2)



1st fitting, Fit :

- the connecting plate (3)
- the clamp (4)
- the ball joint lever (5), with the ball joint greased



2nd fitting :

• refit the selection relay lever (6)



Lightly coat with MOLYKOTE BR2 PLUS (G10) grease :

- the splines (A) of the input shaft of gearboxes manufactured up to 02/01/95
- the clutch release bearing guide (B)

WARNING : an excess of grease on the splines of the input shaft may damage the clutch

Refit the clutch stop (7).



Fill the space between the oil seal lips with grease.

Fit :the final drive right hand output lip seal using the tool [1] the final drive left hand output lip seal ; using the tool [2]

47-Refitting Gear Control

Remontar Controlador das Marchas



2 - REMOVAL

Unclip the gaiter (1) from the central console .

Remove the knob-gaiter assembly by pulling upwards (A).

Remove the bolts (2).

TU1JP ENGINE EMISSION CONTROL CEE 95 TU3JP ENGINE EMISSION CONTROL CEE 95



Remove :

- the collar (3) (using the tool [3])
- the oil vapour breather pipes (at (B))
- the air cleaner assembly (4)

TU5JP ENGINE EMISSION CONTROL CEE 95



Remove :

- the collars (3) (using the pliers [3])
- the oil vapour breather pipes (at (B))
- the air cleaner (4)
- the air outlet union



ALL MODELS

Remove :

- •
- the rods (5) (using the tool [1]) the push rod (6) (using the tool [2]) •

Remove the bolt (7).

Raise the vehicle.



Remove : The exhaust clamp (8).



Remove :

- the exhaust clamp (9)
- the bolts (10)
- the nuts (11)
- the gear lever





Use ESSO NORVA 275 grease to coat the hinges (12).

48-Adjusting Clutch Control

Ajustar Controle da Embreagem



RIGHT HAND DRIVE



ALL MODELS

Check :

- that there is no obstacle (mat etc.) to the clutch pedal travel
- the fitting of the clutch cable on the bulkhead (Å)
- the routing of the clutch cable

RIGHT HAND DRIVE

Check the clamping of the clutch cable to the bulkhead .

CHECK - ADJUSTMENT



Check that there is a minimum clearance (X).

If there is not, adjust the bolt (1).

NOTE : if the clearance (X) is too great this could result in a creaking sound .



Pull the cable at (B) :

- if the cable moves (minimum 5 mm): the clutch cable is adjusted
- if the cable does not move: replace the clutch cable

Check the travel of the clutch cable .

If $Y \ge 24 \ mm$:

• adjustment correct

If Y : Less than 24 mm :

• replace the clutch cable
49-Bleeding the Hydraulic Clutch Cable

Sangria do Cabo Hidráulico da Embreagem

IDENTIFICATION FOR BE4 Gearbox



(1)Brake fluid reservoir.

(2) Hydraulic control master cylinder .

(3) Clutch pedal.

(4) Hydraulic control slave cylinder.

(5) Bleed screw.

BLEEDING

IMPERATIVE : use only clean fluid free from bubbles; avoid any introduction of impurities into the hydraulic system.

Use only approved and recommended hydraulic fluid(s) : DOT4.

IMPERATIVE : do not use automatic bleeding equipment

ALL MODELS

Remove the air filter/connectors assembly (8).



Fill the reservoir with brake fluid (1) to its maximum capacity.

Move the reservoir to drive out the pockets of air .

Fill the reservoir with brake fluid (1) to its maximum capacity.





Connect a transparent tube (10) to the bleed screw (5) and connect it to a receptacle (11) situated lower than the slave cylinder (4).

Create a siphon (12) towards the top using the transparent pipe (10) which is in contact with the bottom of the receptacle.

Open the bleed screw (5).



Operate the clutch pedal (3) manually over its entire travel by 12 rapid forwards and backwards movements (1 forward and backward movement per second).

Leave the clutch pedal (3) at the end of its travel on the last movement .

Close the bleed screw (5).

Raise the clutch pedal (3) to its highest position.

Again : Fill the reservoir with brake fluid (1) to its maximum capacity .

Open the bleed screw (5).

Operate the clutch pedal (3) manually over its entire travel by 12 rapid forwards and backwards movements (1 forward and backward movement per second).

Leave the clutch pedal (3) at the end of its travel on the last movement .

Close the bleed screw (5).

Raise the clutch pedal (3) to its highest position.

Top up the brake fluid level to the MAXI mark on the reservoir .

Release and engage the clutch rapidly 40 times (1 forward and backward movement per second) .

Start the engine .

Apply the handbrake.

Engage a gear.



Check that a start of friction of the clutch mechanism occurs at a distance X greater than or equal to 35 mm (Distance X is given as an indicator).

If incorrect : Repeat the bleed operations .

Tightening torque(s) :

- bolt(s) (5) to 0.75 m.daN
- bolt(s) (6) to 2 m.daN
- bolt(s) (7) to 2 m.daN

MA GEARBOX

TU1JP ENGINE TU3JP ENGINE EMISSION CONTROL CEE 95



Remove :

- the collar (1) (using the tool [1])
- the oil vapours breather tube (at (A))
- the air cleaner assembly (2)

TU5JP ENGINE EMISSION CONTROL CEE 95



Remove :

- the collars (1) (using the tool [1])
- the oil vapour breather pipes (at (A))
- the air cleaner (2)
- the air outlet union



ALL MODELS

Pull the clutch cable to remove it from the clutch lever .



NOTE : *if this is not possible (automatic take-up mechanism jammed) unscrew bolt (3) to create a minimum clearance at the clutch pedal*.



Remove (In the following order) :

- the cable sleeve end piece (4)
- the pad (5)
- the clutch cable from the cable sleeve stop support



Remove the clutch pedal yoke (6).

RIGHT HAND DRIVE



Open the clips (7).



Separate the expansion tank .



Remove the nuts (8).



ALL MODELS

Using a screwdriver (B), press at and remove the clutch cable from the bulkhead crossmember .

Remove the clutch control cable .

REFITTING



Coat the contact surface of the washer TOTAL N3945 with (C) multi-purpose grease at .

Use (ESSO NORVA 2734) grease to coat the yoke (5).

Coat the pad (D) and the pad (6) at (E) with tyre fitting compound .

IMPERATIVE : do not use grease.

Refit the clutch cable in the bulkhead crossmember .

RIGHT HAND DRIVE



Tighten the nuts (7) to 1 da.Nm.



Close the clips (8) one of which is on the sleeve (9).

ALL MODELS

Continue the fitting operations in the reverse order to removal.

Apply and release the clutch several times fully.

Check and if necessary adjust the position of the pedal (Refer to the relevant procedure).



Before refitting the air filter, check that the following components are present and positioned correctly :

- seal (at (F))
- stop (at (G))

Continue the fitting operations in the reverse order to removal

50-Remove and Refit Steering Column

Remover e Recolocar Coluna de Direção

1 - REMOVAL



Remove the bolt (1).

DRIVER'S AIR BAG PRE-TENSIONING SEAT BELTS

IMPERATIVE : deactivate the centralised airbags and seat belts system ; follow the safety instructions .

Remove the airbag.



ALL MODELS

Slacken the bolt (2) by a few threads.

Release the steering wheel from its splines by tapping the rim with your hands .

Position the front wheels straight ahead .

Remove the bolt (2).

Mark the steering wheel and mark the column in order to ensure the correct position of the wheel in relation to the column on refitting .

Remove the steering wheel.

DRIVER'S AIR BAG PRE-TENSIONING SEAT BELTS

Remove the steering wheel carefully without pulling out the supply connector .



ALL MODELS

Remove :

- the fasteners (3)
- the trim panels (4), (5)

DRIVER'S AIR BAG PRE-TENSIONING SEAT BELTS

Move aside and disconnect the connectors linked to the rotary connector .

Remove the rotary connector.



ALL MODELS

Using a screwdriver, unclip and pull the analogue module (6), detach it from the steering wheel ignition lock and allow it to hang .



Disconnect the connectors (7) from the stalk bracket (8).



Remove :

- the bolts (9)
- combination switch bracket (8)



Disconnect the connectors (10), (11).

Release the harnesses clamped on the protector (12).

Unclip the protector (12) at its lower section (a).

Remove the protector (12).



Release the steering universal joint by moving aside the safety clip .



Remove :

- the nuts (13)
- the bolts (14)
- the steering column

REFITTING



WARNING: the steering columns are supplied with an anti-breaking shim (15) to protect the universal joint during handling.

WARNING : remove the shim (15) after refitting the steering column .

Proceed in the reverse order to removal.



When refitting the steering column on its bracket, observe the following order of operations :

- screw the nuts (13) and the bolts (14) without fully tightening them
- release the adjusting mechanism (16)
- tighten the nuts (13) to 4 da.Nm
- lock the adjusting mechanism (16)
- tighten the bolts (14) to 4 daN.m

DRIVER'S AIR BAG PRE-TENSIONING SEAT BELTS

Refit and adjust the rotary connector .

Activate the air bag system.

Check the operation of the air bag warning lamp.

ALL MODELS

Check that the electrical accessories operate correctly .

Initialise the various ECUs .

51-Precautions with Power Steering

Cuidados com a Direção Hidráulica

GENERAL PRECAUTIONS POWER STEERING WITH INTEGRAL RAM



You are going to carry out work on power steering with integral ram.

The reliability of the mechanism depends on the quality of your work .

Consequences of impurities in the system :

- seizure of the mechanism
- jamming of the mechanism
- fluid leaks
- power steering loss

General precautions :

- use new fluid when filling and topping up the system
- use plugs (available from Parts Division) to close the openings of the valve and the pipes
- follow the instructions of the various repair procedures
- carry out the work in a very clean area
- use lint-free cloths

do not use an air nozzle

52-Remove and Refit Power Steering

Remover e Recolocar Direção Hidráulica

REMOVAL

Lift and support the vehicle with front wheels suspended .

Remove :

- the wheels
- the steering ball-joint nuts

Using the extractor [1] detach the ball joints .

POWER STEERING

DRAIN THE HYDRAULIC CIRCUIT .

WARNING : to avoid polluting the power steering system, close both the distributor valve openings and both the steering pipes using plastic plugs.



ALL MODELS

Remove the bolt (1).

Release the steering universal joint by moving aside the safety clip .

Remove the seal (2).



TU ENGINE

The front exhaust pipe (3).

ALL MODELS

Remove :

- the torque reaction rod fastener (4) to the flexible mount fastener
- the nuts (5)



Unclip the link (6), Using the tool [2].

Support the sub-frame using a jack .

Remove the subframe to body securing bolts (7).

Move aside the sub-frame from the body by 80 mm.

Remove :

- the pins (8)
- the notched washers which are located between the steering mechanism and the subframe

Remove the steering mechanism by detaching it via the wheel arch on the driver's side .

REFITTING

Always renew :

- the pins (8)
- the Nyloc nuts

POWER STEERING

Always renew :

• the high and low pressure pipes O-rings



ALL MODELS

(DD): Right hand drive.

(DG) : Left hand drive .

Check that the seal (9) is positioned correctly on the boss (A) in relation to the driver's side of the vehicle .



Grease (LUBRICOMET SP70) : grease :

• the surface (B)

POWER STEERING

Check that the clamping of the pipe (10) and its housing on the gaiters (11) is correct .

ALL MODELS

Proceed in the reverse order to removal.

IMPERATIVE : tighten the pins 8 to 0,5 daN.m: a tightening torque greater than 0,5 daN.m will damage the steering mechanism .

TIGHTENING TORQUE(S)

Tightening torque(s) :

- the studs (8) to 0,5 m.daN
- securing of the sub-frame to the body : 11 da.Nm
- steering mechanism to sub-frame securing nuts (5) : 8 da.Nm
- steering column lower shaft fastener (1): 2,5 da.Nm
- steering ball joint nut : 3,5 da.Nm
- clamp to valve fastener : 2 da.Nm

bulkhead crossmember seal fastener (2) : 0,5 da.Nm

53-Steering Distribution Valve

Válvula de Distribuição da Direção

Remove :

• the steering mechanism

IMPERATIVE : to avoid polluting the power steering system, close both the distributor valve openings and both the steering pipes using plastic plugs.



ALL MODELS

Remove the supply pipes (1), (2).

Plug the openings (3), (4).

Metal damper bolt :

• unscrew the screw (5) several turns

Plastic damper bolt :

• using the tool [3], unscrew the screw (5) several turns



Remove the securing bolts (6).



POWER STEERING

Tighten in a twin-jaw vice :

• the steering mechanism

ALL MODELS

Turn the valve stem as far as the rack limit :

- to the left (left hand drive)
- to the right (right hand drive)

Mark the position of the valve stem centreline (7a) in relation to the body (7b) and the position of the steering rack in relation to the rack fixing .

NOTE : this operation will avoid realigning the steering wheel .

At the rack limit, continue to turn until the valve (7) is extracted from the housing (The pinion screw will lift the valve) .



Remove :

• the O-ring (8)

REFITTING

Fit :

• a new O-ring (8)



Grease the rack pinion (9) (TOTAL N3924/TOTAL N3945 grease).



Draw some marks on the new valve identical to those on the valve which has been removed . Position :

• the distribution valve (7)



Fit the distributor valve (7) using the tools [1], [2].

WARNING : do not use the valve mounting bolts to fit it .

POWER STEERING

Tighten the bolts (6) to 1.5 daN.m.



Position the new O-rings (10).



Fit the supply pipes (1) and (2).

Tighten :

- the power steering pipe unions on the distribution valve tightening torque : 0.8 da.Nm •
- •

54-Tracking Rods

Pivôs de Direção

REMOVAL

Place the vehicle on a two-post ramp .

Remove the front wheels .

Immobilise the steering rack : USING THE TOOL [1].

IMPERATIVE : the tool [1] must be positioned on the teeth of the rack, on the left for lefthand drive, on the right for right-hand drive .

Release the tracking adjusting nut .

Remove the nut from the steering ball joint .

DETACH THE STEERING BALL JOINT USING THE EXTRACTOR [3] .

Remove the steering ball joint .



Unseat the pipe (1) from the gaiter (2) (According to specification).



Remove the collar (3).



Remove the collar (4) : Using a thin screwdriver (According to specification).



Detach the sealing gaiter (2).

NOTE : use a slip product (grease TOTAL N3924 / N3945).

Apply maximum steering lock :

- to the left (left hand drive)
- to the right (right hand drive)

Turn the steering wheel approximately 1/8 turns in the opposite direction .



Position the tool [1] as far as possible in the teeth of the rack and so that the supports with ball joints of the tool [1] can come into contact with the mechanical components (sub-frame, anti-roll bar...).

POWER STEERING CONVENTIONAL STEERING



The ball joints of the tool [1] come into contact with the sub-frame .

Tighten the 4 bolts [1a] of the tool [1].

IMPERATIVE : screw in the threaded pins [1b] by hand to create only simple contact of the ball joints of the tool [1] on the sub-frame .



Position the tool [2] on the connecting rod to be replaced .

55-Filling and Bleeding Power Steering Hydraulic System

Sangria e Abastecimento do Sistema de Direção Hidráulica

DRAINING

Remove the filler cap.

Remove the shield under the power train (according to specification).



REFILLING



Refit the new seals (3).



Fit :

- the clamp (2)
- the bolt (1)

Tighten the bolt (1) to 2 da.Nm .

Refit the shield under the power train (according to specification).



- (H) : Maximum level (Hot) .
- (C) : Maximum level (Cold) .

IMPERATIVE : use new fluid when filling and topping up the system .

Fill the power steering reservoir 10 to mm above the maximum mark (A).

With the engine stopped, Turn the steering slowly from lock to lock in each direction : Approximately 10 times .

Again fill the reservoir up to the maximum level (A).

BLEEDING

Run the engine at idle for 2 to 3 minutes without moving the steering wheel .

Keep the fluid level topped up.

Bleed the circuit by turning the steering several times in each direction .

Keep the fluid level topped up.

(A)Maximum level.

The level must be set with the engine stopped and the wheels straight ahead .

BRAKES

56-Replace Brake Pads

Trocar Pastilhas de Freio

REMOVAL

Remove the filter from the brake fluid reservoir .

Partially drain the brake fluid reservoir using a clean syringe .

Refit the brake fluid reservoir filter .



Remove the bolt (1).


Pivot the caliper (2).

Remove the brake pads .

Visually check :

- the seal around the piston (3)
- condition and fit of the cap (4) and bellows (5)

Check : The disc for wear .

Check the free movement of the caliper sliding sleeves .

Replace any defective parts .

REFITTING

Clean :

- the caliper
- the brake disc using a suitable solvent (type HENKEL)



Push the piston fully home in its housing using a FACOM D60 A [1] type clamp .

PADS WITH LEAF SPRINGS



With the notch (A) in the upper section, position the springs on the pads .

NOTE : the spiral of the springs is positioned opposite the trim .



Fit the brake pads, With the notch (A) in the upper section, correctly position the springs in the caliper .



Push back the caliper (2).

WARNING : handle the caliper carefully in order not to strain the top pin .

Fit a new bolt (1) coated with threadlock loctite .

Tighten the bolt (1) to 3 da.Nm.

Check the brake fluid level and top up if necessary .

IMPERATIVE : press the brake pedal several times, smoothly and gradually, engine running, before driving the vehicle.

57-Replace Brake Shoes

Trocar lona de Freio

REMOVE THE HUB AND DRUM ASSEMBLY .

IMPERATIVE : refer to the relevant procedure .



Remove :

- the spring (1) (using the tool [2])
- the spring (2)
- the hook (3)
- the lever (4)
- the cups (5) and retaining springs using tool [3]

Tilt forwards the assembly of brake shoe, adjustment mechanism and spring (6).

Uncouple the handbrake cable .



Fit the tool [1] on the wheel cylinder.

WARNING : do not damage the wheel cylinder gaiters.

ANTI-LOCK BRAKES

Move aside the ABS sensor (7).

ALL MODELS

Check :

- sealing around the wheel slave cylinder pistons
- the good condition of the wheel slave cylinder rubber protectors
- THE AMOUNT OF DRUM WEAR

Replace the wheel slave cylinder (if necessary).

REFITTING



Clean the backplate (HENKEL type product) .

Always renew : The seal (8).

Grease :

- the surfaces (A) using LUBRITHERM G200 type grease
- the lever pins
- the adjustment mechanism thread



Check that the automatic adjustment wheel rotates freely .

Return the clearance adjustment mechanism to its original position .

Correctly position the adjustment mechanism :

- notched section (B) drum side
- beveled section (C) plate side

Continue the fitting operations in the reverse order to removal.

ANTI-LOCK BRAKES

Fit the sensor (7).

Tightening conditions (Sensor (7)) :

- coat the body of the sensor with ESSO NORVA 275 grease
- tightening torques : 0.9 da.Nm



ALL MODELS

Fit :

- HUB-DRUM
- the washer
- the nut (9)

Tighten the nut (9) to 20 da.Nm.

Lock the nut (9) using the tool [4].

BLEED THE HYDRAULIC CIRCUIT (if necessary).

Apply full pressure to the brake pedal about thirty times (With the engine running, gently and progressively) .

TIGHTENING TORQUES

Wheel slave cylinder brake pipe : 1,5 da.Nm.

Wheel bolts : 8.5 da.Nm .



Tightening conditions (Nut (9)) :

- tightening torque(s) : 20 da.Nm
- lock the nut (9) using the tool [4]

Tightening conditions (Bolt (10)) :

- brush the bolt threads
- coat the bolts with LOCTITE FRENETANCH
- tightening torque(s) : 3,5 da.Nm

Tightening conditions (Wheel cylinders securing bolt(s)) :

- always replace the securing bolts (self-tightening bolts)
- tightening torque(s) : 0,8 da.Nm

58-Adjusting the Handbrake

Ajustando o Freio de Mão

IDENTIFICATION



(A) : Area of mounting on the floor .

(B) : Area of mounting on the reservoir .

CHECK

Lift the vehicle, wheels suspended .

Check that there is a start of friction on the linings from notch no. 2 .

Check that the normal travel does not exceed 8 notches .

If the checks are not correct :

- check that all the cables are routed correctly
- check that the cables are not constrained (incorrect hooking of inner or outer cables, incorrect adjustment)
- check that all the handbrake control components slide or move freely
- adjust the handbrake

ADJUSTMENT

Lift the vehicle, wheels suspended .

WARNING : the main brake circuit must be bled.



Disconnect and move aside :

• the connectors (1), (2)

Remove :

- the bolt (3)
- the central console (4)

Release the handbrake lever in the passenger compartment .



Slacken the secondary cables by unscrewing the nut (5).

Handbrake off : Press the brake pedal 40 times (Engine running).

Slightly tighten the nut (5) until the cables begin to tighten .

Pull the handbrake lever normally approximately ten times .

Place the lever at the notch no. 2 of its travel from its rest position .



Turn the nut (5) until the brake linings start to make contact .

Check that the normal travel does not exceed 8 notches .

Check that both the secondary cables (6) on the balance beam (7) move together .

With the handbrake released, check that the rear wheels turn freely by hand .

Check that the handbrake warning light comes on from the 1st notch of the total travel of the lever .

59-Bleeding Brake System

Sangria do Sistema de Freio

MANUAL BLEEDING (AT THE PEDAL)

Two operators are necessary.

Connect a transparent pipe to the bleed screw.

Press the brake pedal slowly.

Open the bleed screw .

Hold the pedal fully down.

Close the bleed screw .

Allow the brake pedal to return naturally .

Repeat the operation until the brake fluid runs out clean and free from bubbles .

Proceed in the same way for the other wheels

60-Brake Servo

Servo Freio

LEFT HAND DRIVE

Uncouple the clutch control from the gearbox .



Remove the bolt (1).

Release the steering universal joint by moving aside the safety clip .

Unhook the cable from the clutch pedal .

Disconnect the cable from the bulkhead .



Remove :

- the bolt (2)
- the shaft (3)
- the 4 nuts (4)

Disconnect : The stop lamp connector (5).

Move aside : The clips (8).



Uncouple the vacuum pipe (9) from the brake servo unit .

Remove the brake servo unit (10).

REFITTING

Fit a new seal on the brake servo unit and on the master cylinder .

Always renew : The shaft (3) (Grease the shaft (3)).



NOTE : check the brake servo unit piston rod recess : $X = 22.3 \pm 0.1$ mm (this measurement is taken between the master cylinder support face and the head of the piston rod).

Proceed in the reverse order to removal.

61-Braking Master Cylinder

Cilindro Mestre do Freio

REMOVAL



Disconnect the connector (1).

Remove the filter from the brake fluid reservoir.

Drain the brake fluid reservoir (2), using a clean syringe.

RIGHT HAND DRIVE BE4 GEARBOX

Move aside the clutch cable supply pipe (2a).

Close the clutch cable hole .

ALL MODELS

Remove :

- the pin (3) securing the reservoir (2)
- the brake fluid reservoir (2)



Uncouple the brake pipes (4).

Blank the holes in the master cylinder and the brake pipes .

Remove :

- the nuts (5)
- the master-cylinder (6)





Always renew :

• the seal (7)



NOTE : check the brake servo unit piston rod recess : $X = 22.3 \pm 0.1$ mm (this measurement is taken between the master cylinder support face and the head of the piston rod)

62-Refit Rear Suspension Pipes

Tubulações da Suspensão Traseira

REMOVAL

The vehicle is placed on a lift.

From inside the vehicle, remove :

- handbrake console
- disconnect the handbrake cables at the balance beam

Under the vehicle, remove :

- the spare wheel
- the exhaust pipe after the catalytic converter



Support the rear axle on a hydraulic jack under the cross member .



Disconnect : The brake pipes (1).

Plug the pipes after removal.

Disconnect the ABS inductive sensors (according to specification).

Remove the four rear axle securing bolts .

Lower the hydraulic jack .

Carefully detach the rear axle assembly rearward .

REFITTING

Support the complete rear axle on a transmission jack under the cross member (Offer up the assembly under the vehicle).

WARNING : when refitting, take care the brake pipes are not crushed by being trapped between the axle and the body.



Insert the securing bolts without tightening them (Rear suspension).



Position the two calipers [1] at the front of the rear crossmember to align the rear crossmember .

Tighten the securing bolts to 11 da.Nm .

Remove the two calipers [1].

Reconnect : The brake pipes (1).

Fit :

- fit the handbrake cables to the balance beam
- fit the exhaust assembly pipes using a new joint

Tighten : The exhaust pipe .

63-Rear Drum Hubs

Presilhas do Tambor de Freio

REMOVE THE REAR HUB.



Remove the bearing retaining circlip (1a) or ring (1b).



Press out the bearing using the tool [1].



64-Refit Brake Calipers

Recolocar Pinças de Freio

REMOVAL



Remove the wheel.

REMOVE THE BRAKE PADS .

Disconnect : The brake hose to the rigid pipe .

Recover the U clip (1).

Plug the brake pipe .

Remove the brake hose .



Remove :

- the bolts (2) of the caliper bracket
- the caliper + bracket assembly

REFITTING

Refit the caliper with its bracket .

Fit 2 new bolts (2) (coated with threadlock)).

Tighten the bolts (2) to 10.5 daN.m.

Fit :

- the brake hose to the caliper
- tightening torque 1.5 da.Nm

Fit :

- the brake hose to the rigid pipe
- tightening torque 1.6 da.Nm

WARNING : take care not the twist the brake hose .

65-Stop Lamp Switch

Interruptor da Luz de Freio

REMOVAL



Disconnect the connector (1).

Remove the switch by pulling it.

REFITTING

Press the brake pedal by hand.

Insert the switch fully into its bracket .

Push the brake pedal to its stop by hand .

The switch should return with the pedal and so be adjuste

66-Front hub

Acoplador do Disco de Freio Frontal

REMOVAL

Remove the pivot.



Remove the front hub bearing retaining circlip (1).



Hold the front pivot in a vice .

Fit the tool [5].



Fit the tool [6].

Fit the tool [2].

Extract the hub (2) with the bearing inner half-race (3).



Fit two wheel bolts to the hub then mount the hub in a vice .

Remove the bush (4).



Fit the tool [5].

Fit the tool [1].

Extract the inner bearing race (3) using the extractor [1] and the thrust pad [5].



Position the inner race (3) in its housing .

Place the tool [3] on the press loading table .

Fit the pivot on the tool [3].

Bring the tool [4] into contact with the bearing race.

Press out the bearing .

67-Antiroll Bar

Barra Anti Torção

ANTI-ROLL BAR BEARINGS



The anti-roll bar is supported in two flexible bearings (4).

Lateral and horizontal positioning is guaranteed by means of two flats (A) on the inside of the mounting and by mouldings (B) on the bar section .

A clamp (3) retains the assembly.

Open the bearing.



Align the internal flats (A) with the mouldings (B) on the anti-roll bar (one on either side) .

68-Rear Antiroll Bar

Barra Anti Torção Traseira

ON THE RIGHT-HAND SIDE



Remove :

•

.

- the bolt (1)
- the washer (2)
- the cap (3)



Coat the thread and the end of the bolt [1] with slip product .

Screw the bolt into the lever until it contacts the bar .

Continue screwing to extract the lever .

ON THE LEFT-HAND SIDE



Remove :

•

- the bolt (4)
- the washer (5)

Remove the anti-roll bar with its left-hand lever .

REFITTING

IMPERATIVE : check whether the two shock absorbers are fitted or removed .

Run a M8 X 125 tap through the anti-roll bar thread .

WARNING : thoroughly clean the splines on the bar and in the levers .



Fit the dummy damper [2].

Adjust its length (1/2 turn = 0.5 mm) to allow free engagement of both eyes .

Tighten the lock nut and the dummy damper fixings .



Remove :

- the bolts (5)
- the thrust washers (6)



Remove :

- the bolts (7)
- the thrust washers (8)



IMPERATIVE : mark the position of the bar in the arm with two centre punch marks (a) and (b).



Fit :

- the adaptor [3] to the end of the anti-roll bar
- slide hammer puller [1] on the adaptor

Stage 1 :

• push the torsion bar to release it

Stage 2 :

• pull the torsion bar to remove it

Restrain the arm to prevent it from coming out with the the bar .

Remove the slide hammer and adaptor .

WARNING : before removing the dummy damper, support the arm to maintain its approximate position.

Remove the dummy damper [2].



Measure the dimension (X) of the dummy damper [2].

REFITTING

Adjust the dimension (X) of the dummy damper [2] :

- to the value determined for ride height correction
- to the value shown in data if the torsion bar is being replaced
- to the value measured on removal in other cases



WARNING : do not reverse the bars when refitting.

Right hand bar : paint ring (A).

Left hand bar : two paint rings (B).

Clean :

- the torsion bar splines
- the internal splines in the arms

Coat the splines of the bar with ESSO NORVA 275 grease .



Insert the bar through the arm bracket :

- in the case of ride height correction, offset the marks made on removal by the number of splines determined
- in the case of a new torsion bar, find by rotation, spline by spline, the position where it enters freely 8 to 10 mm
- in other cases, align the marks made on removal

NOTE : the spline end of the bar cannot be fully inserted as its ends are not in the same axis .

Due to the even number of splines at the ends of the bar, it can be freely inserted in two diametrically opposed positions without modifying the ride height .

Complete insertion of the bar up to its stop using the slide hammer [1], [3].

Remove the slide hammer and adaptor .

Fill the recess with ESSO NORVA 275 grease .


APPLY A BEAD OF GREASE TO THE ENDS OF THE BAR SPLINES .



APPLY A BEAD OF GREASE TO THE ENDS OF THE BAR SPLINES .



Position (Depending on the operation) :

- the thrust washers (6)
- the bolts (5)

Tighten the bolts (5) to 2 daN.m.



Position (Depending on the operation) :

- the thrust washers (8)
- the bolts (7)

Tighten the bolts (7) to 2 daN.m .

69-Rear Damper

Amortecedor Traseiro

REFITTING



Refitting :

- the damper
- new nuts

IMPERATIVE : do not tighten the nuts .

70-Removal and Refit Front Lower Arm

Remover e Recolocar Braço/Bandeija Frontal

REMOVAL

Position : The spring retaining rods .

Lift and support the vehicle with front wheels suspended .



Remove :

- the wheel
- fastening (1) of the ball joint to the pivot

Extract the wishbone ball joint from the pivot using the tool [2], taking care not to damage the ball joint boot with the chain of the tool [2].

Lock the lower wishbone in the lower position (Use a socket).



 $\{\{N11661\}\}\$ maintenir le pivot vers l'arrière avec un fil de fer, afin de ne pas endommager la rotule de pivot .

Remove :

- arm front articulation fastener (2)
- the fastener (3)
- $\{\{n11662\}\}\$ le bras inferieur

REFITTING



Position the lower arm fitted with its flexible bushes and including that for the ball joint .

Refit the bolts which secure the wishbone to the sub-frame .

71-Load Compensator

Compensador de carga

REFITTING



Parts Division supplies the compensator with a shim (7) used in production .

Do not use this shim for adjusting the brake pressure during Service operations .

Remove the block.

Proceed in the reverse order to removal.



Ensure that the spring (6) is correctly positioned on the spacer (8).

Coat the bolt (5) with threadlock LOCTITE.

Tighten the bolt (5) to 2 da.Nm .

Position :

- the spring (6) in the compensator lever
- the compensator on its bracket



In order to adjust the clearance at the centralising dowel pin (9) apply force in the direction of the arrow

72-Wipers Motor

Motor de Limpador de Parabrisa

REMOVAL

IMPERATIVE : switch on the ignition : ensure that the motor is in the stop position (stop position on the stalk) switch off the ignition .



Remove the fasteners (1).

Using the tool [1] extract the wiper arms .

Remove the water flow grille (2).

Remove :

- the fasteners (3)
- the fastener (4)
- the air duct (5)

Disconnect the connector (6).

RIGHT HAND DRIVE

Remove :

- the battery
- the battery container (7)

ALL MODELS

Remove :

• the front wiper motor assembly

REFITTING

Proceed in the reverse order to removal.



Engage the front wiper motor assembly, following a movement A then B.

NOTE : before tightening the wiper arms, operate the wipers ; put the switch to position : *STOP* ; position the blades in relation to the marks on the windscreen .

Tighten the fastener (1) to 2,5 daN.m. .

Check the operation.

73-Rear wiper

Motor do Limpador Traseiro

REMOVAL



Release the cover (1).

Remove :

- the nut (2) •
- •
- the wiper arm (3) the wiper shaft nut (4) •
- the cover (5)•
- the wiper seal (6) •



Unclip the trim (7).



Disconnect the connector (8).

Drill out the rivets (9) using a 0.75 mm drill bit .

IMPERATIVE : when removing the rivets : protect the screen and the tailgate ; limit the depth of drilling to 15 mm ; localise the falling of the rivets by placing cloths each side of the motor support in the tailgate(for this operation, wear protective goggles) .

Remove :

• the fastener (10) the wiper motor (11)

74-Rear Water Jet

Motor de Esguicho Traseiro



Open the tailgate .

Remove the fasteners (1).

Push on the pins to extract the brake light from its housing .



Release the bulb holder (3) and separate it from the reflector.



Remove the washer jet (4) by unscrewing a quarter turn.

75-Replacing Headlamps

Farol

REMOVAL



Remove :

- the grille
- the fasteners (1)
- the electrical connections
- the headlamp

REFITTING



Position the headlight aligning plate (2) on the shaft (3).

Make the electrical connections .

Engage the headlight until the guide (4) penetrates the flanged edge of the wing .



Tighten the bolts in the following order : A, B, C .

Fit the grille .

Check :

• the electrical operation

the adjustment of the lamps

76-Fog Lamp Kit

Kit Luz de Neblina

CONTENTS OF THE FOG LAMP KIT



- (A) : Section of the fog lamp harness leading to the fog lamps .
- (B) : Section of the fog lamp harness leading to the engine wiring housing .
- (\mathbf{C}) : Section of the fog lamp harness leading to the passenger compartment .

Remove :

- the battery and detach its plastic unit (according to specification)
- the upper and lower covers and the wiring housing harness

CONNECTION OF THE FOG LAMP HARNESS TO THE ENGINE WIRING HOUSING

Clip:

- the grey wire : to cell J2
- the brown-yellow wire : to cell J1
- the white wire : to cell N1
- the yellow-green wire : to cell N2

The cell markings are engraved under the engine wiring housing .



Fit :

- the fuses 10 A (9) to locations (D)-(E)
- the relay (8) in position (F)

Refit the engine wiring housing.



Remove the rubber closer (G) located to the left of the clutch pedal .

Using a screwdriver, drive out the plastic protective cover from the bottom of the recess to free the bulkhead opening .

ROUTING OF THE FOG LAMP HARNESS



Route the fog lamp harness and clip it along the original harness using plastic clips (13).

Connect the fog lamp harness yellow-green earth wire to the vehicle earth behind the front left headlight unit .



Engage the harness fitted with the grommet (10) through the vehicle bulkhead in order to determine the position of the grommet on the harness .

SEALING



Seal the grommet (10) on the harness using mastic (7).

(H) : To the passenger compartment .

CONNECTION OF THE FOG LAMP HARNESS TO THE LIGHTING STALK

Remove :

- the upper and lower steering column cowlings
- the lighting stalk

Disconnect the 2 stalk connectors .

Clip the white wire of the fog lamp harness to the black 10-way connector at way 4B .

Reconnect the 2 connectors to the lighting stalk (11) then refit the stalk .

FITTING THE FOG LAMP OPERATION WARNING LIGHT

Vehicle fitted with a 3 dial instrument panel.



Drill a 8 mm diameter hole marked at (I) in the steering column upper cowling .

Clip the LED (5) in the hole.

Connection of the fog lamp operation warning light :

- delete the clip from the end of the yellow wire
- strip the end of the yellow wire for 5 mm
- connect the red wire of the LED (5) to the yellow wire of the fog lamp harness using a Raychem sleeve (6)
- connect the black wire of the LED (5) to the yellow-green wire (4) of the fog lamp harness using a Raychem sleeve (6)



Remove :

- partly : the door seal (J) (on the driver's side)
- partly : the carpet (K)

Connect the earth terminal of the yellow-green wire (4) to the vehicle earth (L).

Clip the yellow-green wire (4) along the original harness using clips (13).

Refit :

- the carpet
- the door seal
- the steering column finishers

Vehicle fitted with a 4-5 dial instrument panel :

- remove the instrument panel
- open the 26-way connector (yellow)
- insert the clip on the yellow wire into position 3
- close the 26-way connector (yellow)
- resecure the instrument panel

FITTING OF THE FOG LAMPS TO THE BUMPER

Remove :

- grille
- the bumper



Carefully cut the bumper along the inner marking and adjust if necessary .



Fit the cut-out finishing rings (2) marked (G) and (D).

The marking letter on the trim is to be positioned at the top when fitted to the bumper .



Engage :

- the cage nut (14) in its housing
- the 2 upper plates of the lamp in the bumper locations

Secure the fog lamps (1) to the bumper using bolts (12).

On the left-hand side : No. 67742320.

On the right-hand side : No. 67742310.

Connect the fog lamp harness to the fog lamps.

Fit the bumper.

Place the vehicle on a lift (In order to clip the harness along the front crossmember using clips (13)).



Return the vehicle to its wheels .

Adjust the fog lamps, vehicle empty .

Refit the mud shields .

(Notice valid subject to product modification).

77-Outside Temperature Sensor

Sensor de Temperatura do Ambiente

Remove :

- the mirror (right)
- the mirror glass



Remove the bolts (1).



Remove the bolts (2).



Move aside the assembly at (A) using a plastic spatula.

Detach the sensor (3) and the harness to obtain a sufficient length of wire .

Cut the black wires of the sensor at (B) and restore the electrical connection using soldering connectors .

Insulate the connector with the heat shrink sleeve .

REFITTING

Proceed in the reverse order to removal.

Test all the electrical functions several times .

78-Remove and Refit the Fuel Filler Neck

Remover e Remontar Cano de Entrada de Combustível

Empty the tank using draining equipment.

Place the vehicle on a lift with rear wheels suspended .

Remove :

- the right hand rear wheel
- the mud shield



The securing bolts (1) (Fuel filler neck).



Remove the clips (2).

Mark the pipes (3) and (4).

Cut :

- the pipe (3) at X = 55 mm from the elbow (A)
- the pipe (4) at Y = 150 mm from the union (B)

Remove :

• fuel filler neck

REFITTING

Re-assemble in the reverse order to dismantling .

WARNING : do not transpose pipes (3) and (4) when refitting the filler neck.

Connect pipes (3) and (4)

79-Remove and Refit the Fuel Cap Cover

Montar e Desmontar a Tampa da Bomba de Combustível

REMOVAL

Remove the fuel cap.

Remove the key.



Fit a protector under the cover (1).

Press and turn (opposite direction to the arrow) the cap (2) to detach it from the lugs (A) of the cover .

Remove the cover (1).

REFITTING



Fit opposite the arrow, the lug cut at right angles (B).

Engage all three lugs by turning (in the direction of the arrow) and press .

80-Remove and Refit Fuel Tank

Remover e Remontar o Tanque de Combustível

ALL MODELS

Empty the tank using draining equipment.

Place the vehicle on a lift with rear wheels suspended .

Remove :

- the right hand rear wheel
- the mud shield



Remove : The securing bolts (1) (Fuel filler neck).

Remove the intermediate silencer.



Remove the metal heat shield (2).



Unclip the hand brake cables from the tank .

Remove the tank securing bolts (3).

Lower the tank without removing it .

Disconnect :

- the pipes connected to the tank and to the filler neck
- the fuel gauge connector

Remove : Tank and filler neck assembly .

REFITTING

Re-assemble in the reverse order to dismantling.

81-Remove and Refit Fuel Gage

Montar e Desmontar Bóia da Bomba de Combustível

Tilt the rear seat .



Drill out the rivets (1) using a 5 mm drill bit .

WARNING: drill the hole(s) limiting penetration of the drill bit to 10 mm by means of a depth gauge.

Remove :

• the panel (2)



Remove :

• the protector (3)

Disconnect :

- the connector (4)
- the fuel supply pipe (5)
- the fuel return pipe (6)

TU1JP ENGINE TU3JP ENGINE TU5JP4 ENGINE EW10J4 ENGINE DW8 ENGINE DW10TD ENGINE DW8B ENGINE



Remove the ring (7) using the tool [1].

IMPERATIVE : always replace the seal (8).

REFITTING

When placing the module in the tank, take care not to damage the following components :

- the gauge seal (8)
- the float arm (9)



Place the module in position in the tank aligning the arrrow (a) with the mark (b) .

Refit the ring (7) and tighten using the tool [2] until the mark (c) is aligned with the arrow (a) and the mark (b).



Reconnect :

- the supply pipe (5) and the return pipe (6)
- the connector (4)

Fit :

- the protector (3) (notch (d) : towards the front of the vehicle)
- the panel (2)

OUTSIDE - BONNET

82-Grille

Grade Frontal

Open the bonnet.



Remove :

- the fasteners (1)
- the grille (upper part) (2)
- the bolt connecting to the cassette and fan assembly (3)
- the fasteners (4)

Unfasten the grille (5) (In the following order) :

- at the centreline of the vehicle
- at the end of each headlight

Remove the grille (5).

REFITTING

Insert and clip the two ends in the left and right housings of the front wing supports .

Clip the grille :

- at the bottom of the end of the headlight : tighten the bolts (4)
- at the centreline of the vehicle under the badge

Tighten the bolt (3) which secures the upper rigid plate connecting with the fan assembly cassette .

OUTSIDE - BONNET

83-Bonnet Opening Cable

Cabo de Abrir Capô

Operate the bonnet opening control.



Remove :

- the bottom trim (1)
- the fastener (2)

Release the opening control (3).

Remove :

• the Built-in Systems Interface



Unclip the radiator grille upper protective grille.

Unclip :

• the cable (4) on the lock (5)



Tape the sleeve [2] onto the cable (4).

Pull the cable from the passenger compartment .

REFITTING

Attach the sleeve [2] to the new cable .

Coat the sleeve with soapy water.

Pull on the sleeve [2].

Guide the cable along the wing .

Remove the sleeve [2].



Pull on the grommet using the pliers [3].

Hook the cable (4) onto the lock (5).

OUTSIDE - BONNET

Proceed in the reverse order to removal
84-Refitting Front Door

Recolocar Porta Dianteira

REFITTING A DOOR



Fit the tool [1] on the door.

Remove :

• the pins (3)

Remove the door hinge pins .

Remove the check strap from the front pillar.



Protect the rear edge of the front wing using adhesive tape in the working area of the wrench .

Replace the door.

Refit the pins (3). Secure the check strap to the front pillar.

85-Gutter seals

Borrachas da Porta

Open the door.



Remove the drip moulding seal (1) from the support (A).

REFITTING



Position the drip moulding seal (1) in the housing (B).

Fit the drip moulding seal starting at the rear.

86-Opening Door Mechanism

Mecanismo de Abertura da Porta

Raise the glass .

Remove :

- the door trim panel
- the seal



Unclip the connection rod (1) on the outer handle .



Remove the interior handle (2) by pulling the handle towards the hinges .

Release the clip (3).

Remove the fasteners (4).



Release : The electrical connection (5).

Unclip this connection from the control unit .

Remove the mechanism assembly (A) by turning it to detach the pin from the lock .

Pass the assembly through the opening (B).

87-Door Striker

Batente da Porta

ADJUSTMENT DOOR STRIKER

In the event of difficulty in closing the door following adjustment of the flush fitting clearances .

Remove :

- the fasteners (1)
- the indexed striker (2)

Fit a 306 type striker without indexing.

Adjust the striker at the door lock .

Lock the mountings (1).

88-Door Lock

Trava da Porta

REMOVAL



Remove the blank from the door shut face .

Screw the tool fully into the fork .

Pull the assembly to release the fork from the lock .

Remove the lock by pivoting it .

REFITTING

Fit the lock closely against the door .

Gently engage the fork .

Push the fork fully into the lock .

Check that the lock is securely held before removing the tools .

Proceed in the reverse order to removal.

89-Electric Window

Vidro Elétricos

REMOVAL OF THE MANUAL MECHANISM (ON THE LEFT AND RIGHT HAND DOORS)



Lower the glass approximately two thirds of its travel .

Remove : The trim pad .

Remove : The sealing sheet (By cutting the edge bead of adhesive using a cutter).



Unclip the window (2 clips at (A)).



Raise the window and retain it in the high position with adhesive tape (B).



Drift out the rivet studs (C) before drilling out .

Unclip the mechanism cable retaining clip $\left(D\right)$.

Drill out the rivets (C) using a 6,4 mm drill bit .

Remove the manual window mechanism (E) .

Vacuum up the remains of the drilled out rivets .



Fit the electric window mechanism (F) to the door .

Position the rivets (C) to align each part of the mechanism .

Rivet.

Clip the mechanism cable retaining clip (D) and the window .

ELECTRICAL CONNECTIONS



Disconnect the battery .

On the handbrake console, remove the box/rear blank (G) .

Fit the 2 electric window switches (4) on the switch bracket (3).

Connect the harnesses (8) to the electric window switches (4).

Route the harnesses (8) in the handbrake console as far as the bulkhead .

Route the 2 x 2 blue/black wires (motor supplies) towards the right and left hand door grommets .

Fit the bracket + switches assembly on the handbrake console .



ROUTING OF HARNESSES

Unclip the door grommets (H).



Unclip the connectors (I) by operating the lock (J).

Route the 2 blue/black electric window motor wires and pass them into the grommets (H).

WIRING DIAGRAM

Disconnect the battery.

Remove the passenger compartment fuse box .

IMPERATIVE : check the polarity of the motors before fitting the connectors (13).



(A)Red.

(B) Brown.

(C) Grey.

(D) Black.

(E) Blue.

(F) Orange.

TEST(S) OF OPERATION



Connect the battery .

Check the polarity of the motors before fitting the connectors (13).



(K) Black wire .

(L) Blue wire .

Fit the motor clip holders .

90-Passenger Storage Compartment

Porta Luvas

REMOVAL



Remove :

- the pins (1)
- the glove box cover



Remove the fasteners (2) - (3).

Push the storage compartment into the base of the fascia.

Pivot the storage compartment so as to remove it from the bottom .

91-Cover Hinge

Presilhas do Porta Luvas

PARTS REQUIRED



(1) New storage compartment.



Repair kit :

- 2 quick-fit attachments (2)
- 2 torx metal bolts M 4,2 X 19
- 2 washers ø 5 mm + 2 washers ø 8 mm





On each side insert a \emptyset 5 mm washer then a \emptyset 8 mm washer, then secure the 2 quick-fit attachments prepared using the 2 bolts at (C).



Engage the 2 opening movement limiters (3) and clip the pins of the new storage compartment onto the quick-fit attachments .

92-Head Rest Guide

Apoio de Cabeça

REPLACEMENT HEAD-REST GUIDE

REMOVAL



Remove the head restraint .

Insert a screwdriver blade into the guide to destroy the locking clips (A).

Remove the head-rest guide .

REFITTING

Position the new guide in the backrest frame .

Clip the head-rest guide .

93-Rear Seatbelt

Cinto de Segurança Traseiro

REMOVAL



Remove :

- the fastener (1)
- the trim (2)
- the rivet (3)

Detach the trim (4).



Remove :

- •
- the fasteners (5) (6) the quarter light surround •



Remove the fastener (7).

<u>94-Sound Deadening Pads</u> <u>Compartimento de altofalantes</u>

IDENTIFICATION SOUND DEADENING PADS



95-Heater panel

Painel Central



Remove :

- the upper central panel (1)
- the centre panel (2)
- the radio (according to specification)



Remove the fasteners (3).

Press on the air conditioning control panel at point (A) to tilt it towards the interior .



Release the control panel (4) from its housing .

Remove the clips (5), (6), (7) to release the cables .

Unclip the connector (8).

<u>96-Fascia</u>

Painel do Carro

Disconnect the battery .



Remove :

- the steering wheel module (1) (refer to the procedure check repairs adjustment air bags)
- the steering wheel (2) marking its position on the splines
- the central console (3)
- the lower trim (4) under the steering wheel
- the side switches (5) (according to specification)
- the blanks (6)
- the steering column

Pull the lower section of the visor (7) to detach it .

Finish unclipping the upper section .

Remove the binnacle (7).



Remove the fastener (8).

Disconnect the instrument panel connectors .

Remove the instrument panel (9).



Unclip the upper centre panel (10) by pulling it towards you .

Disconnect the hazard warning lights switch (11).



Remove the fasteners (12).

Disconnect the connector .

Remove the clock (13) or the display (According to specification).



Remove the panel (14) or the radio (According to specification).

Remove the fasteners (15).

Unclip the centre panel (16), by pulling it gently towards you .

Remove the centre panel (16).



Remove the fasteners (17) - (18) - (19).



Remove the fastener (20).

Remove the fastener (21) for the earth lead .



Remove the fasteners (22).

Disconnect the connector (23).



Remove the fastener (24).

For the following operations, two operators are necessary : On each side, lift the fascia and pull it towards you to detach it from the air conditioner and the windscreen .

Remove the fascia.

REFITTING

Proceed in the reverse order to removal.

97-Airbag Connector

Conector do Airbag

Switch off accessories fitted with micro-processors .



Disconnect the battery negative cable (1).

Protect the cable and the negative terminal to prevent any contact .



Remove the floor console .

Disconnect the connector 18V.OR (2).

WARNING : the ECU must never be removed with the connector connected .

A/C

98-Heater

Ar condicionado

REMOVE THE FASCIA .



WARNING : place a receptacle under the heater matrix inlet and outlet pipes .

Check that all of the fascia harness wires are disconnected .

Pull the air conditioner towards you and remove it .

REFITTING



WARNING: check that the fasteners (6) and the expandable mounting (7) are present before refitting the air conditioner.

A/C

99-Blower Speed Resistance

Resistor de Corrente de Ar

Disconnect the battery .

Remove the glove box .

Move the air intake control to the RECIRCULATION position .



Insert your hand into the air intake duct .

Take hold of the blower speed resistor unit (1) by the protective lid and release it from the duct by turning towards the left .

Pull towards you to detach it from the duct accompanied by the harness .

Press on either side of the connector to release it, pull the connector .

Disconnect the resistor .

REFITTING

Proceed in the reverse order to removal.

A/C

100-Heater Blower

Ventoinha do Ar Condicionado

ALL MODELS

Pivot the blower anti-clockwise to release it from its housing on the air conditioner (A).



WARNING : remove the bolt (1) which may be present in some repair fittings.



Pull the blower to release it from the air conditioner .



Pull the blower to release it downwards .

Remove the blower.

Disconnect the connector(s) according to specification .

RIGHT HAND DRIVE

Remove the blower via the storage compartment opening.

ALL MODELS

REFITTING

Proceed in the reverse order to removal.



WARNING : in the event of poor gripping of the blower on refitting, secure the blower using 1 $0.4 \times 15 \text{ mm Torx bolt}(s)$ at (B) on the plate .

101-Heater matrix

A/C

Matriz do Ar Condicionado

Disconnect the battery .

Remove :

- the fascia
- the heater



Using a pair of pliers, cut the securing tabs (1).



Using a pair of pliers, cut the securing tabs (2).

Remove :

- the fastener (3), (4)
- all the heater matrix pipes
- the matrix



Secure all the heater matrix pipes on the heater matrix using nut bolts (4), (5).

Secure the heater matrix to the air conditioner using bolts (6).

IMPERATIVE : in the case of replacement of all the heater matrix pipes, securing to the heater matrix is by the tabs (2) and the bolt (4).

102-Evaporator sensor

A/C

Sensor do Evaporador

PS: COMPRESSOR MANUAL IS LOCATED AT ENGINE DRESS CHAPTER

REMOVAL

Remove the trim under the fascia (On the driver's side).



Disconnect the electrical connection (1).

Turn and pull the sensor (2) to dislodge it from its bracket (3).

Remove the sensor .

REFITTING

Proceed in the reverse order to removal.

OUTSIDE

103-Mirror Gusset

Sistema de Arrumar Espelhos

REMOVAL



Pull the cheater (1) towards you gradually to unclip it at (A) and (B).



Turn the tweeter (2) to unclip it from the cheater (1).

Remove the cheater (1).

OUTSIDE

104-Replacing the mirrors

Substituindo Espelhos

REMOVAL



Using a small flat tool, unclip the mirror glass .

Disconnect the electrical connections (According to specification).

REFITTING

Proceed in the reverse order to removal.
105-Side protector

Protetor Lateral

REMOVAL



Using a nylon spatula, gently unclip the protectors starting at the front .

106-Frontal Deflector

Defletor Frontal

Place the vehicle on a lift.



Remove :

- the clips (1)
- the deflector ((2))



Mark the holes to be drilled in line with the diagram 8 mm from the edge of the deflector with a centreline distance of 120 mm.

107-Front Wings and Bumper

Paralamas frontais e Parachoque

Open the bonnet .

Remove :

- the grille (upper part) •
- the grille (lower part) headlight
- •



Remove :

- the fasteners (1) •
- the clip (2) •
- the mud shields •

Disconnect the wing repeater .

Open the door.



Slacken the mounting (3) passing via the interior of the wing .



Remove the fasteners (4).

NOTE : on the left-hand side : secure the bonnet .

Remove :

• bonnet stay



Remove the fasteners (5).

Release the wing by removing it from its mountings .



Press on the bumper .

Remove the front wing .



NOTE : on the left-hand side : apply a $2 \times 8 \times 400$ mm bodywork mastic filler and sealer between the wing inner panel and the wing flange.

Insert the wing in the centralising stop (A).

Proceed in the reverse order to removal.

108-Rear bumper

Parachoque traseiro

REMOVAL

Place the vehicle on a lift.



Remove :

• the fasteners (1)

Lower the lift .

Open the tailgate .

Remove :

- the fasteners (2)
- the electrical connection (3)

Remove the bumper.

REFITTING

Proceed in the reverse order to removal.

Check the operation of the lights .

Compiled by jasycs

REFERENCES

Compiled by Jasycs (shared by Guarux.A) v.1.0.0

All content was taken from the official Peugeot 206 repair website but some data may not be available

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