

Product: 1980 Audi 100/200 Car Service Repair Workshop Manual

Full Download: <https://www.arepairmanual.com/downloads/audi-100-200-car-service-repair-workshop-manual/>

V.A.G Service.



Workshop Manual Audi 100, Audi 200.

2.2 litre fuel injection engine
(K-Jetronic/turbocharger)

Sample of manual. Download All 149 pages at:

<https://www.arepairmanual.com/downloads/audi-100-200-car-service-repair-workshop-manual/>

May 1980 edition.

Product: 1980 Audi 100/200 Car Service Repair Workshop Manual

Full Download: [https://www.arepairmanual.com/downloads/audi-100-200-car-ser](https://www.arepairmanual.com/downloads/audi-100-200-car-service-repair-workshop-manual/)

Full Download: [https://www.arepairmanual.com/downloads/audi-100-200-car-ser](https://www.arepairmanual.com/downloads/audi-100-200-car-service-repair-workshop-manual/)

Repair Group	Title/contents	Repair Group	Title/contents	Repair Group	Title/contents
	MAINTENANCE Engines and information sources Technical data/settings Tightening torques Delivery Service Standard Service Standard Service intervals Standard Service 1 Standard Service 2-4-6-etc. Standard Service 3-5-7-etc. Descriptions of service operations Identification plate, chassis and engine numbers Lifting vehicle Towing		2.2 LITRE FUEL INJECTION ENGINE (K-Jetronic/turbocharger) page 10 Engine – removing and installing 2 13 Crankshaft group 15 15 Cylinder head, valve gear 25 17 Lubrication 39 19 Cooling 47 20 Fuel system 52 21 Turbocharger 60 25 K-Jetronic, controls 63 26 Exhaust system 84 28 Ignition system 96		AUTOMATIC GEARBOX 087 AND 089 EXCHANGING COMPONENTS 32 Torque converter 37 Controls, housing 38 Gears, hydraulic controls 39 Final drive, differential Only supplied in W. Germany
	1.6 LITRE ENGINE 10 Engine – removing and installing 13 Crankshaft group 15 Cylinder head, valve gear 17 Lubrication 19 Cooling 20 Fuel system 22 Carburetter 26 Exhaust system 28 Ignition system 30 Clutch		5-CYL. DIESEL ENGINE 10 Engine – removing and installing 13 Crankshaft group 15 Cylinder head, valve gear 17 Lubrication 19 Cooling 20 Fuel system 23 Injection system 26 Exhaust system 28 Glow plugs 30 Clutch		RUNNING GEAR AUDI 100 40 Front suspension, drive shafts 42 Rear suspension 44 Wheels, tyres, wheel alignment 46 Brakes – mechanism 47 Brakes – hydraulics, regulator, servo 48 Steering
	2.0 LITRE ENGINE 10 Engine – removing and installing 13 Crankshaft group 15 Cylinder head, valve gear 17 Lubrication 19 Cooling 20 Fuel system 22 Carburetter 26 Exhaust system 28 Ignition system 30 Clutch		4-SPEED MANUAL GEARBOX 014/II 34 Controls, housing 35 Gears, shafts 39 Final drive, differential 4-SPEED MANUAL GEARBOX 088 34 Controls, housing 35 Gears, shafts 39 Final drive, differential		BODY REPAIR WORK 55 Engine hood, luggage compartment lid, tailgate 57 Front doors 58 Rear doors 60 Sun roof 64 Windows, window mechanism 66 Exterior fittings 68 Interior fittings 70 Trim 72 Seat frames
	2.2 LITRE CARBURETTER ENGINE 10 Engine – removing and installing 13 Crankshaft group 15 Cylinder head, valve gear 17 Lubrication 19 Cooling 20 Fuel system 22 Carburetter 26 Exhaust system 28 Ignition system		5-SPEED MANUAL GEARBOX 016 34 Controls, housing 35 Gears, shafts 39 Final drive, differential AUTOMATIC GEARBOX 087 32 Torque converter 37 Controls, housing 38 Gears, hydraulic controls 39 Final drive, differential		HEATING, AIR CONDITIONER 80 Heating 85 Ventilation 87 Air conditioner ELECTRICAL SYSTEM 27 Starter, current supply 90 Instruments, radio 92 Windshield wipers and washer 94 Exterior lights and switches 96 Interior lights and switches 97 Wiring
			AUTOMATIC GEARBOX 089 32 Torque converter 37 Controls, housing 38 Gears, hydraulic controls 39 Final drive, differential		CURRENT FLOW DIAGRAMS Main and additional current flow diagrams CURRENT FLOW DIAGRAMS Main and additional current flow diagrams from 1980 model year

Sample of manual. Download All 149 pages at:

<https://www.arepairmanual.com/downloads/audi-100-200-car-service-repair-workshop-manual/>

Workshop Manual Audi 100, Audi 200.

**2.2 litre fuel injection engine
(K-Jetronic/turbocharger)**

May 1980 edition

Supersedes the 2.2 litre engine booklet,
March 1978 edition

The Workshop Manual is divided into separate booklets, which can also be ordered individually, so they can be used in every work-bay as and when required.

This booklet is valid for the new Audi 100 and for the Audi 200 as from the start of production (August 1976/January 1980). It describes all principal repair operations which require special instructions to ensure satisfactory work.

Arrangement of booklets

There is an alphabetical index and another index according to repair operations in every booklet to facilitate finding the information required. Where special tools and workshop equipment are required, these are listed with the repair operations in the table of contents.

This list also shows where the alternative Audi special tools can be used instead of the VW tools, and vice versa.

Technical data are listed before the repair instructions. Where necessary, the repair instructions start with an exploded drawing which shows the most important repair notes. There are also photographs, referred to in the exploded drawings, to show the position of parts in the vehicle or illustrate the use of

special tools as required. When a particular sequence has to be followed for dismantling and assembling, the major steps in the operation are described after the exploded drawing. Similarly, adjustment procedures are described as a complete operation.

Workshop Bulletins

Workshop Bulletins will be allocated to the individual booklets and should be filed at the back of the booklet concerned. To remind you that bulletins have been published, please mark the bulletin number by hand on the page of the manual given in the bulletin.

Fault finding

General fault finding instructions are incorporated in the Workshop Manual. The following additional fault finding guides have also been published:

K-Jetronic

Brakes

Automatic Gearbox.

Further instructions on tracing and repairing likely faults are given in the "Fault Finding Handbook."

Technical information should always be made available to all foremen and mechanics because compliance with the instructions given is essential to ensure vehicle roadworthiness and safety. In addition, the normal safety precautions to be observed when working on motor vehicles are also applicable.

REPAIR OPERATIONS AND SPECIAL TOOLS

Rep. Op.	Operation	Page	VW Audi Special tools	Workshop Equipment
10 01 05 ..	Engine, checking and adjusting	25, 68, 69		VW 1313 or VW 1367 VW 1387, compression tester
10 01 19 ..	Engine, removing and installing	2	2024 A VW 785/1 VW 540	
10 01 37 ..	Engine, dismantling and assembling	15	10-201, 2083 10-202, 2084 2026, 10-203 2086, 10-208 2003/1, 10-212 VW 207 C or 12-551 2078, 10-213 2079 2080	Universal piston ring tensioner Piston ring pliers Micrometer 85 mm Internal measuring appliance 85 mm dia.
10 19 02 ..	Checking compression	25		Compression tester
10 31 19 ..	Engine carrier, centre, removing and installing	2		
10 35 20 ..	Bonded rubber mounting, removing and installing	6, 14		
13 10 02 ..	Pistons, checking	20		Piston ring pliers Micrometer 85 mm Internal measuring appliance 85 mm dia.
13 10 20 ..	Pistons, removing and installing	20	VW 207 C or 12-551 2078, 2083, 10-208, 10-212	Universal piston ring tensioner
13 19 19 ..	Piston rings, removing and installing (set of rings)	20		Piston ring pliers
13 40 02 ..	Conrod, checking bearing clearance	20		
13 48 01 ..	Crankshaft, checking bearing clearance	15		
13 48 19 ..	Crankshaft, removing and installing	15	10-201, 10-213 2080, 2084 2079 2086 2003/1	
13 59 19 ..	Crankshaft oil seal (flywheel end), removing and installing	15	10-201 2086 2003/1 10-213	



Contents

REPAIR OPERATIONS AND SPECIAL TOOLS

Rep. Op.	Operation	Page	VW Audi Special tools	Workshop Equipment
13 67 19 ..	Bearing in crankshaft, removing and installing	15	2026, 10-202	
13 74 19 ..	Crankshaft oil seal (pulley end), removing and installing	39	2079 2080 2084 2086	
13 76 19 ..	Belt pulley, removing and installing	39		
13 78 19 ..	V belt, removing and installing	2		
15 01 06 ..	Valve clearances, checking and adjusting	30	2078 10-208 10-212	
15 14 19 ..	Camshaft oil seal, removing and installing (sprocket end)	30	2085, 10-203	
15 24 19 ..	Toothed belt, removing and installing	25		
15 63 20 ..	Valve stem oil seals, removing and installing	30	2036, 10-218 2078, VW 541/1 10-101, VW 653/3 10-203 10-208 10-212	
15 70 19 ..	Cylinder head, removing and installing	25	2083	Socket wrench
15 70 37 ..	Cylinder head, dismantling and assembling	30	2037 2078 10-101 10-203 10-208 10-212 10-218 VW 387	Dial gauge
15 70 41 ..	Cylinder head, repairing	30	2085, 10-215 10-203 10-204 10-206	Valve seat cutter Valve grinder
15 70 49 ..	Cylinder head, tightening down	25		
15 70 55 ..	Cylinder head, renewing (exchange head)	25	2078 10-208 10-203 10-212	
15 75 19 ..	Valve guides, removing and installing	30	10-206 10-215	
15 82 19 ..	Cylinder head cover, removing and installing	25		
17 03 01 ..	Oil pressure, checking	39	VW 1342	



Contents

REPAIR OPERATIONS AND SPECIAL TOOLS

Rep. Op.	Operation	Page	VW Audi special tools	Workshop Equipment
17 05 19 . .	Oil pressure switch, removing and installing	39		
17 20 19 . .	Oil pump, removing and installing	15		
17 50 19 . .	Sump, removing and installing	39		
19 01 01 . .	Cooling system, complete check	47	VW 1274	
19 05 19 . .	Fan, removing and installing	47		
19 13 19 . .	Fan thermostwitch, removing and installing	47		
19 50 19 . .	Water pump, removing and installing	47		
19 58 19 . .	Thermostat, removing and installing	47		
19 62 19 . .	Coolant hose, removing and installing	47		
19 70 19 . .	Radiator, removing and installing	47		
19 78 19 . .	Temperature sender unit, removing and installing	47		
20 10 19 . .	Fuel tank, removing and installing	52		
20 15 19 . .	Fuel gauge sender unit, removing and installing	52	2012	
20 31 19 . .	Fuel filter, removing and installing	52		
20 58 19 . .	Fuel accumulator, removing and installing	52		
20 66 19 . .	Fuel pump (electric), removing and installing	52		
20 83 19 . .	Accelerator pedal cable (automatic gearbox), removing and installing	81		
20 82 19 . .	Throttle cable/linkage, removing and installing	81		
22 04 05 . .	Idle speed, adjusting	68		VW 1367 or VW 1313 VW 1387
25 40 19 . .	Injectors, removing and installing	63, 64		
25 46 19 . .	Warm-up valve, removing and installing	63, 64		
25 48 19 . .	Cold start valve, removing and installing	63, 65		
25 49 19 . .	Thermo time switch, removing and installing	63, 65		
25 60 19 . .	Fuel distributor, removing and installing	63, 64		

IV

Contents

REPAIR OPERATIONS AND SPECIAL TOOLS

Rep. Op.	Operation	Page	VW Audi Special tools	Workshop Equipment
25 62 19 ..	Air flow meter, removing and installing	63, 64		
25 63 15 ..	Flow meter plate, adjusting	63, 64		
25 50 19 ..	Auxiliary air valve, removing and installing	63, 64		
26 01 19 ..	Exhaust system, removing and installing	84, 85		
26 10 19 ..	Exhaust manifold, removing and installing	84		
26 17 19 ..	Exhaust pipe front, removing and installing	84, 85		
26 25 19 ..	Front silencer, removing and installing	84, 85		
26 30 19 ..	Main silencer, removing and installing	84		
26 33 19	Rear silencer, removing and installing	84, 85		
28 20 19 ..	Coil, removing and installing	96, 97		
28 29 05 ..	Ignition timing, checking and adjusting	96, 97		VW 1367 or 1313
28 30 01 ..	Distributor, checking	96, 97		VW 1367 or 1313 Vacuum gauge Ohmmeter Voltmeter VW 1315 A
25 30 19 ..	Distributor, removing and installing	96, 97		VW 1367 or 1313

Contents

ALPHABETICAL CONTENTS LIST

	Page		Page
Accelerator cable, adjusting	81, 82	Electric fuel pump, checking	52
Air cleaner, dismantling and assembling	83	Engine and gearbox, aligning	6, 20
Air cleaner, position	63, 64, 83	Engine list and information sources	1
Antifreeze concentration	47	Engine, mounting in repair stand	5, 19
ATF cooler	49	Engine, removing and installing	2
Camshaft oil seal, renewing	30	Exhaust gas recirculation, checking	91
Camshaft, removing and installing	30	Exhaust pipe, fitting free of strain	84, 85
Bearing caps, position	30	Exhaust system, removing and installing parts	84, 85
Checking axial play	30	Exhaust system, vacuum connections	86, 90
Capacity, cooling system	47	Exhaust valve seats, refacing	32
Centrifugal spark advance, checking	101	Expansion tank cap, checking	47
Check valve, electric fuel pump		Flywheel/drive plate, removing and installing	15
checking	52	Fuel filter, position	52
renewing	52	Fuel gauge sender, removing	52
CO content, adjusting	69	Fuel pump relay, checking	52
Compression, checking	25	Fuel pump, removing and installing, checking (electric)	52
Conrod bearings, checking	20	Fuel system, removing and installing parts	52
Checking axial play	20	Fuel tank, removing	52
Checking radial clearance	20	Fuel tank breather valve, position checking	53
Conrods, position	20	Gasket, cylinder head cover, renewing	25
Identification	20	Gasket, sump, renewing	39, 40
Coolant, draining and putting in	47	Gravity valve, checking (tank)	52
Coolant pump, removing and installing	48	Idling speed, checking	68
Cooling system	47, 48	Ignition system, repairing	96, 97
Checking cap	47	Centrifugal advance, checking	96, 97
Checking for leaks	47	Coil, measuring primary resistance	96, 97
Removing and installing parts	47, 48	Coil, measuring secondary resistance	96, 97
Thermostat, position	47	Distributor, installing	96, 97
Crankshaft oil seal, renewing		Hall generator, checking	107
Flywheel end	21	Hall system	97
Pulley end	39, 41	Induction-type system	96
Crankshaft, removing and installing	15	Ignition tester, connecting	80
Bearing caps, position	15	Ignition timing, adjusting	96, 97
Checking axial play	15	Inductive sender, checking	105
Checking radial clearance	15	Plug connectors, checking	96, 97
Flywheel, dismantling and assembling	15	Plug leads, checking	96, 97
Grinding data	15	Rotor arm, checking	96, 97
Cylinder head		Technical data	98
Checking distortion	30	Timing mark, marking subsequently	18
Gasket, renewing	25	TCl control unit, checking	96, 97
Removing and installing	25	Transistorized coil ignition system, safety precautions	96, 97
Reworking dimension	30	Vacuum advance/retard, checking	96, 97
Cylinder bores, measuring	23	Vacuum unit, checking	96, 97
		Inlet valve, refacing	30
		Inlet valve seats, refacing	32

Contents

	Page		Page
K-Jetronic injection system, repairing	63, 64	Technical data	
Adjusting idling and CO	63, 64, 65	Engine	1
Adjusting lever and plunger, checking	63, 64	Fuel system	52
Air flow meter, removing and installing	63, 64	Ignition system	98
Auxiliary air valve, checking	63, 65	K-Jetronic	66, 67
Checking cold start valve	63, 65	Thermopneumatic valve, EGR, checking	92
Checking holding pressure	63, 65	Throttle, basic setting	80
Checking injectors	63, 64	Throttle control, repairing	81
Connecting pressure tester	63, 65	Pedal cable, adjusting (automatic)	81
Flow sensor plate, checking, adjusting	63, 64	Throttle cable, adjusting (manual)	82
Fuel distributor, removing and installing	63, 64	Toothed belt, installing	25
Operating tester	63, 65	Toothed belt, tensioning	39, 41
Pressure regulator valve, renewing seals	63, 64	Turbocharger, checking	55
System pressure, check	63, 65	Turbocharger, removing and installing	54
Technical data	66, 67	Two-way valve, connections	91
Thermo-time switch, checking	63, 65		
Vacuum limiter, checking	63, 65	Vacuum advance/retard, checking	96, 97
Warm up valve, checking	63, 64	Vacuum amplifier, checking	92
		Vacuum connections	86-90
Lubricating system, removing and installing parts	39	Vacuum hoses, WC, WE, WG, WJ	86-90
		Vacuum unit, distributor, checking	96, 97
Needle bearing, renewing	20	Valve cotters, removing	30
		Valve gear, dismantling and assembling	30
Oil filter, removing and installing	39	Valve play, checking and adjusting	30
Oil pressure, checking	39	Valves, grinding	30
Oil pressure switch, checking	39	Valve guides, checking wear	30
Oil pump, removing and installing	39	reaming	30
Oil sump, removing and installing	39	removing and installing	30
Oil spray jet, position	30	Valves, removing and installing	30
		Valve springs, removing and installing	30
Piston pins, removing and installing	20	Valve seats, refacing	30
Piston rings, removing and installing	20	Valve stem seals, renewing	30
Checking gap	20	Valve timing, adjusting	25
Checking side play	20	Valve, two-way, connection	91
Marking position	20	V-belt, removing and installing	2
Pistons, checking	20	V-belt, adjusting	2
Pistons, conrods, dismantling and assembling	20	Vibration damper, removing and installing	39
Pistons, marking position, identification	20		
Pistons, removing and installing	20	Waste gate, checking	61
Pistons, oversizes	20	Water pump, removing and installing	48
Pressure gauge, connecting, operating	63, 65		
Reworking dimensions, cylinder head	31		
Rotor arm, checking	96, 97		
Starter wiring, checking	100		
Spring seat, removing	30		
Suction pump; position, adjusting	93, 94		

LIST OF ENGINES AND INFORMATION SOURCES

The following table contains engine code letters and general information on all engines which have been installed in Audi 100/Audi 200 vehicles to date; it also lists the publications which cover these engines.

Code letters		CN	WA	WB	WC	WD	
Engine data							
Manufactured	from	8.78	8.76	3.78	5.77	5.77	5.77
	to		7.78			7.79	
Capacity	litres	2.0	2.0	2.2	2.2	2.2	2.2
Output	kW at rpm	51/4800	85/5500	85/5500	100/5700	79/5300	79/5300
Torque	Nm at rpm	123/3000	168/3500	166/4000	185/4200	155/4000	155/4000
Bore	mm	76.5	86.5	79.5	79.5	79.5	79.5
Stroke	mm	86.4	84.4	86.4	86.4	86.4	86.4
Compression ratio		23.0	9.3	8.3	9.3	8.0	8.0
Valve timing at 1 mm valve lift and zero clearance							
	inlet opens before TDC	5° after	6°	6°	0°	6°	6°
	inlet closes after BDC	21°	42°	44°	51°	44°	44°
	exhaust opens before BDC	27°	46°	40°	40°	40°	40°
	exhaust closes after TDC	5° before	2°	10°	10°	10°	10°
RON	min.	45 CZ	98	91	98	91	91
Carburetor/Fuel injection		Diesel	2B3	2B2/2B5 *	K-Jetronic	K-Jetronic	K-Jetronic
Distributor		—	046905205 C	035905205 A** 035905205D***	035905205	035905205 B	035905205 B
Exhaust gas recirculation		—	—	—	—	X	X
Catalyst		—	—	—	—	—	—
Lambda closed loop		—	—	—	—	—	—
Turbocharger		—	—	—	—	—	—
Engine is specially tuned for:						USA	Canada
Information							
	Order No. 1)						
Workshop Manual							
1.6 l engine	0.97.537.111 ..	—	—	—	—	—	—
2.0 l engine	0.97.537.121 ..	—	X	—	—	—	—
2,2 l carburetor engine	0.97.537.132 ..	—	—	X	—	—	—
2.2 l fuel injection engine	0.97.537.271 ..	—	—	—	X	—	—
5-cyl. Diesel engine	0.97.537.241 ..	X	—	—	—	—	—
Maintenance	0.97.537.102 ..	X	X	X	X	—	—
US tourist vehicles	000 533 852 ..	—	—	—	—	X	X
Fault finding guide:							
K-Jetronic	000 530 423 ..	—	—	—	X	X	X
Current defects:							
Service Handbook 2)		X	X	X	X	—	—
Fault Finding Handbook 3)	000 530 451 ..	X	X	X	X	—	—

* From 1980 models onwards
 ** For automatic gearbox only
 *** For manual gearbox only

1) See service publications list for language index.
 2) Distributed in W. Germany only
 3) Distributed in export countries only

LIST OF ENGINES AND INFORMATION SOURCES

The following table contains engine code letters and general information on all engines which have been installed in Audi 100/Audi 200 vehicles to date; it also lists the publications which cover these engines.

WE			WF	WG	WJ	WK	YV
5.77 7.78 2.2	3.77 2.2	8.78 2.2	8.76 2.0	8.77 2.2	1.80 2.2	1.80 2.2	8.76 1.6
79/5300	85/5300	79/5300	77/5500	100/5700	125/5300	100/5400	63/5600
163/4000	168/4000	163/4000	155/3500	185/4200	265/3300	202/3000	124/3200
79.5	79.5	79.5	86.5	79.5	79.5	79.5	79.5
86.4	86.4	86.4	84.4	86.4	86.4	86.4	80.0
8.0	8.0	8.0	7.0	9.3	7.0	7.0	8.2
6°	6°	6°	6°	0°	3°	3°	4°
44°	44°	44°	42°	51°	47°	47°	46°
40°	40°	40°	46°	40°	43°	43°	44°
10°	10°	10°	2°	10°	7°	7°	6°
91	91	91	83	98	98	91	91
K-Jetronic	K-Jetronic	K-Jetronic	2B3	K-Jetronic	K-Jetronic	K-Jetronic	2B2/2B5 *
035905205 B	035905205 B	035905205 B	046905205 C	035905205 C	035905205 F	035905205 H	049905206 D
X	X	-	-	X	-	-	-
X	-	X	-	-	-	X	-
-	-	X	-	-	-	X	-
-	-	-	-	-	X	X	-
California Japan	Sweden	California Japan	Countries with low octane fuel (M 240)	Sweden		USA (incl. California and Japan)	
-	-	-	-	-	-	-	X
-	-	-	X	-	-	-	-
-	-	-	-	-	-	-	-
-	X	-	-	X	X	-	-
-	-	-	-	-	-	-	-
-	-	-	X	X	X	-	X
X	-	X	-	-	-	X	-
X	X	X	-	X	X	X	-
-	-	-	X	-	X	-	X
X	X	X	-	X	-	X	-

* From 1980 models onwards

** For automatic gearbox only

*** For manual gearbox only

1) See service publications list for language index

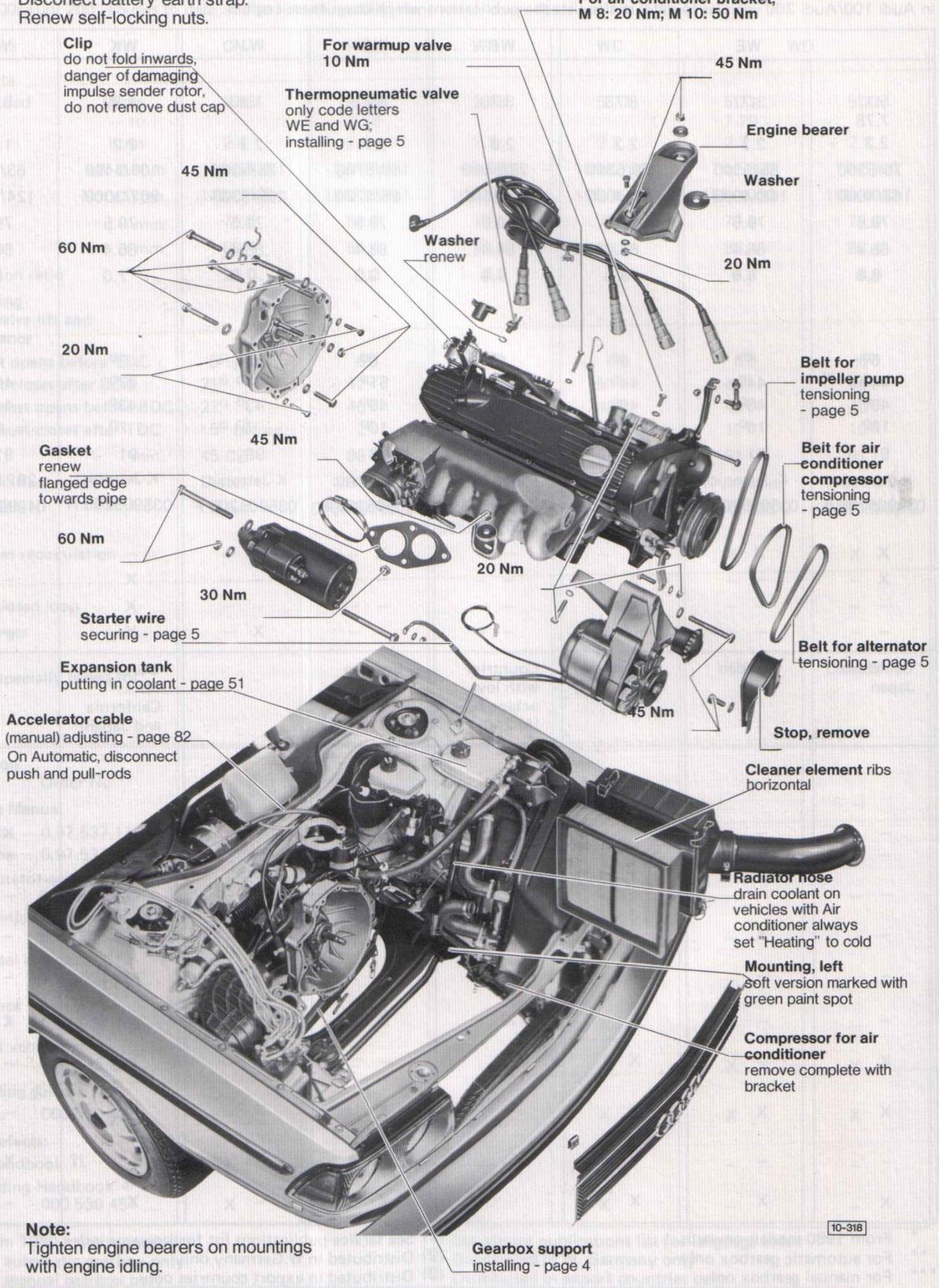
2) Distributed in W.Germany only

3) Distributed in export countries only

10 Removing and installing engine

REMOVING AND INSTALLING ENGINE (Vehicles with engine code letters WC, WE, WG)

Disconnect battery earth strap.
Renew self-locking nuts.



Removing and installing engine 10

REMOVING AND INSTALLING ENGINE

(Vehicles with engine code letters WC, WE, WG)

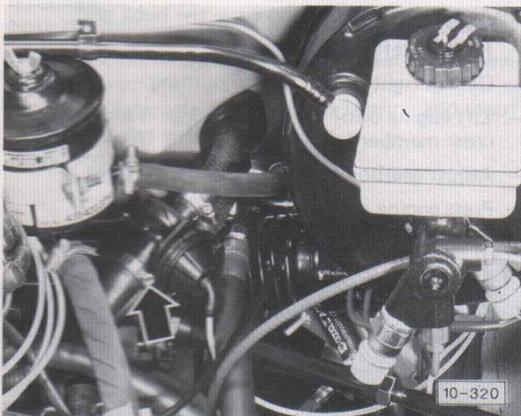
The engine is lifted out without the gearbox

Removing

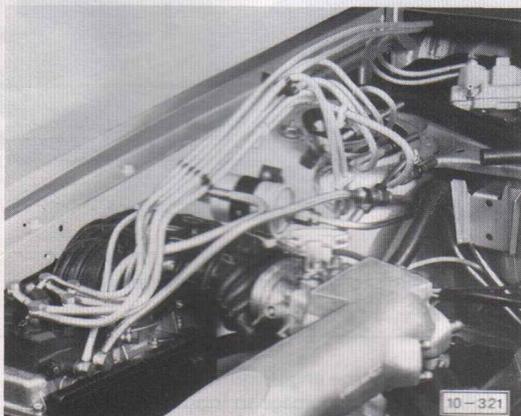
- Detach battery earth strap.



- Take cap off expansion tank.
- Detach coolant hose from expansion tank.
- Drain coolant; catch coolant for later use.



- Detach coolant hose at connector, drain coolant.



- Remove warm-up valve, cold start valve and injectors.

Note:

All fuel lines should remain connected.

- Detach air duct and vacuum hoses from intake manifold and throttle assembly.
- Remove air cleaner cover and filter element.



- Disconnect lock cable by pulling guide sleeve in direction of arrow.

If air conditioner is fitted:

Remove radiator grille, detach condenser and tilt it outwards.

Vehicles with power assisted steering

- Remove impeller pump but leave pipes connected.

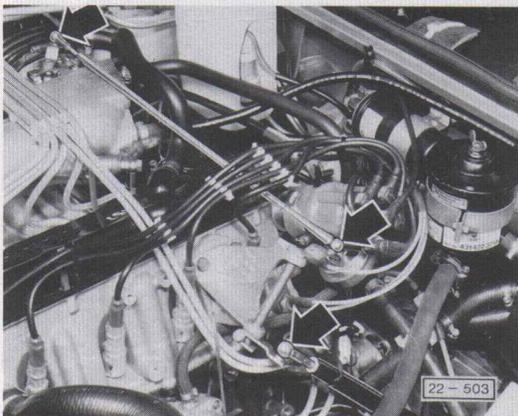
Vehicles with engine code letters WE and WG

Remove vacuum amplifier and thermopneumatic valve on cylinder head.

- Detach ignition coil from bulkhead.
- Detach windshield washer container.
- Detach PAS reservoir from bracket.
- Remove distributor cap with ignition leads and rotor arm.

Vehicles with manual gearbox:

Disengage throttle cable from throttle assembly and pull through support bracket on cylinder head cover.



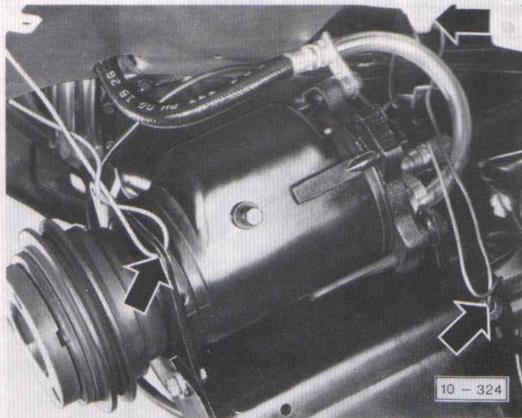
Vehicles with automatic gearbox:

Disengage push rod and pull rod.

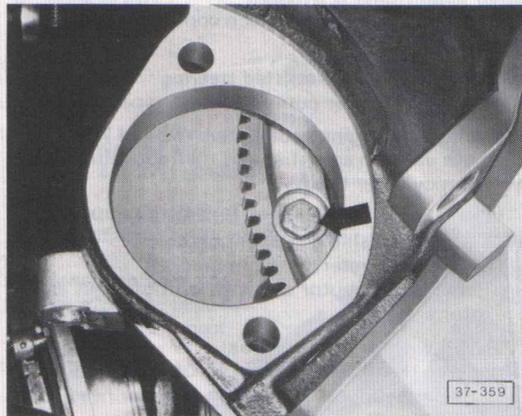
10 Removing and installing engine

If air conditioner is fitted:

Detach compressor complete with bracket, leaving pipes connected.



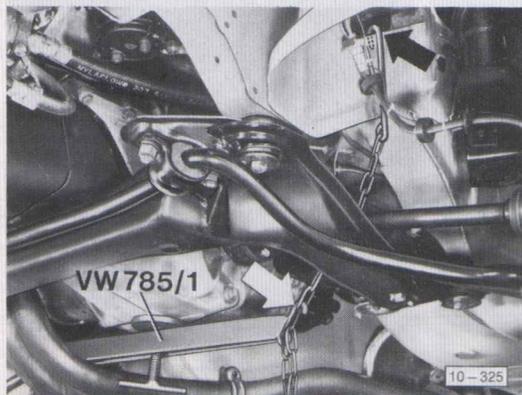
- Secure air conditioner compressor.
- Detach exhaust pipe from manifold and gearbox bracket.
- Remove front stop from cross member.
- Remove generator and bracket.
- Remove starter.



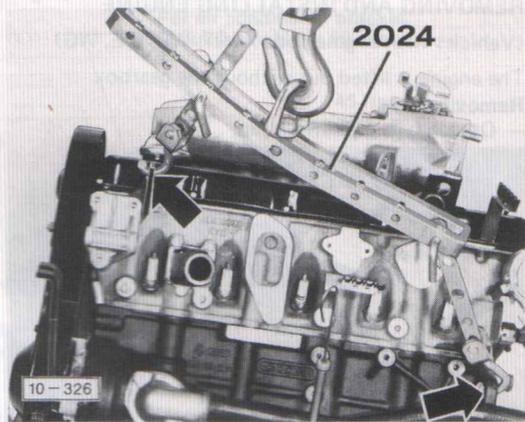
Vehicles with automatic gearbox

Detach converter.

- Remove all lower engine-gearbox bolts.



- Install gearbox support.
- Remove upper engine-gearbox bolts.

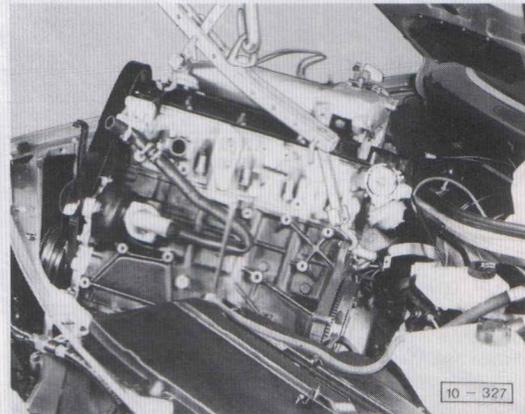


- Attach lifting bar:
Position 3 - hole 2
Position 8 - hole 4

Note:

To ensure that the engine lifts properly the hooks must be attached in the right hole and the right position. The positions marked 1 - 4 on the cross bar must be towards the pulley end. The holes in the hook bars are counted from the hook end.

- Remove left engine bearer.
- Detach right bearer from mounting.
- Lift engine until vibration damper is just above cross member I.
- Adjust gearbox support to take up weight.
- Press engine off gearbox.



- Lift engine further while turning it to the right.
- Turn engine to transverse position and lift it right out.

Caution

While lifting, the engine must be guided carefully to prevent damage to input shaft, clutch and body.

Vehicles with automatic gearbox:

Secure converter to prevent it from falling off.

Removing and installing engine 10

Mounting engine on repair stand



- To facilitate work on the engine, mount it on a repair stand with bracket VW 540.

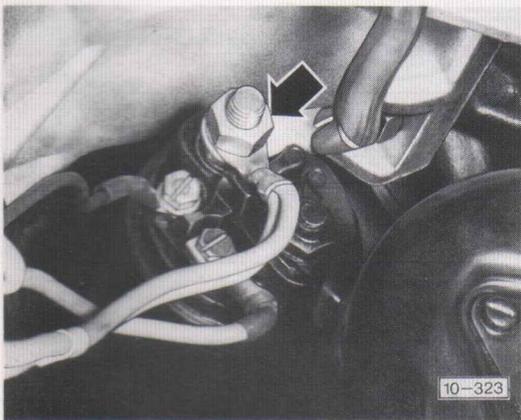
Important

Do not measure the cylinder bores (see repair group 13) with the engine mounted on the repair stand because this may cause a certain amount of distortion.

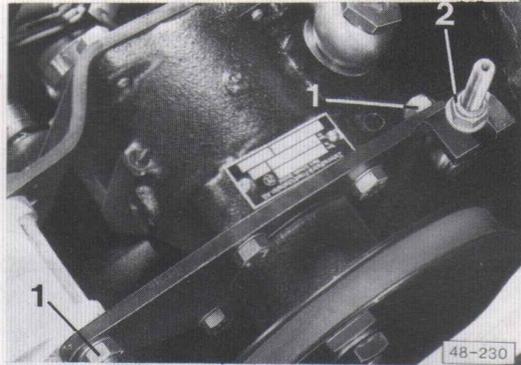
Installing:

Note the following points when installing the engine.

- Check clutch release bearing for wear, and renew if necessary.
- Lightly lubricate clutch release bearing and input shaft splines with MoS₂ grease.
- Always renew self-locking nuts.



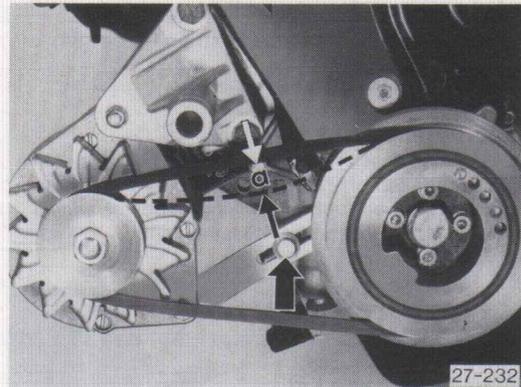
- Securing starter wire.



- Tensioning impeller pump belt:
Loosen nuts - 1 -
Turn adjusting nut - 2 - as required
Tighten nuts - 1 -.

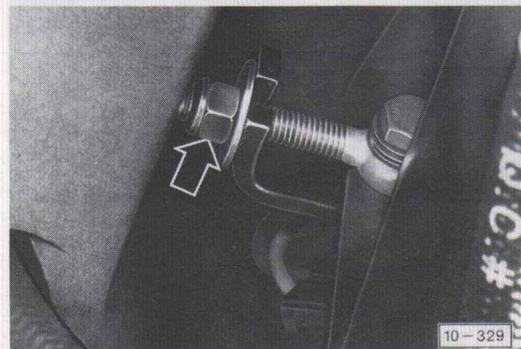
Note:

Belt tension is correct if the belt yields about 10 mm when pressed with the thumb halfway between the two pulleys.



- Tension alternator belt: a = 10-15 mm. Loosen bolt (arrow), swing alternator outwards and then tighten bolt again.

If air conditioner is fitted:



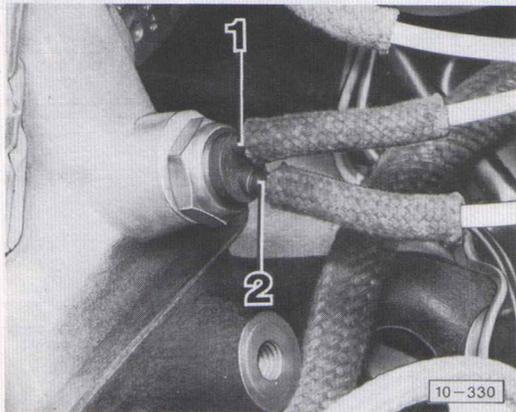
- Tension compressor belt by turning nut on tensioner as required after loosening 4 mountings on alternator bracket.

Note:

Belt tension is correct if the belt yields about 10 mm when pressed with the thumb halfway between the pulleys.

10 Removing and installing engine

Vehicles with engine code letters WE and WG



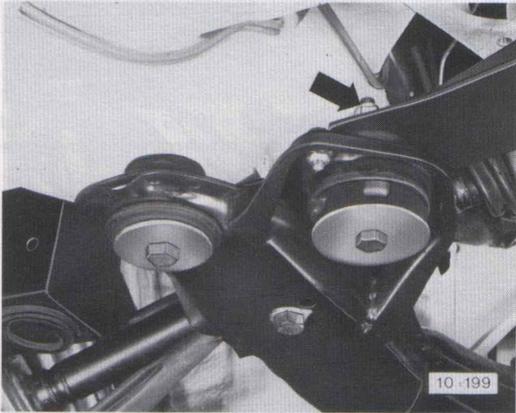
Install thermopneumatic valve.
Straight connection – 1 – goes to EGR valve and
angled connection – 2 – to vacuum booster.

- Adjust accelerator cable – page 82
- Fill cooling system – page 51
- Align exhaust system free of strain – page 84

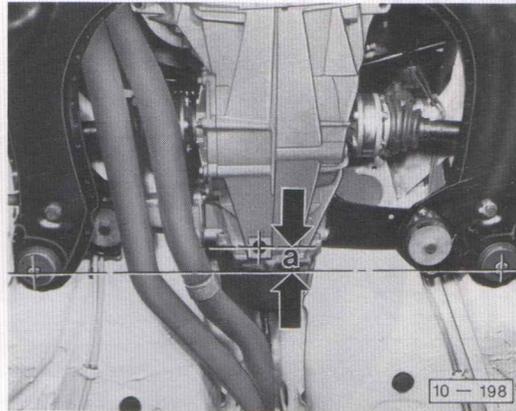
ALIGNING ENGINE AND GEARBOX

Note:

This is only necessary if the engine and gearbox have **both** been taken off the mounts. If **only** the engine has been removed, tighten the engine bearer/engine mount attachments with the engine idling.



- Loosen both nuts securing gearbox carriers to mountings.
- Loosen both nuts on engine bearers, left and right.



Manual gearbox:

Distance $a = 29.4 \pm 1.5$ mm

Automatic gearbox:

Distance $a = 127.4 \pm 1.5$ mm

- Move gearbox and engine in longitudinal direction by shaking them on the mountings.

Note:

Engine and gearbox cannot be adjusted laterally or vertically.

6

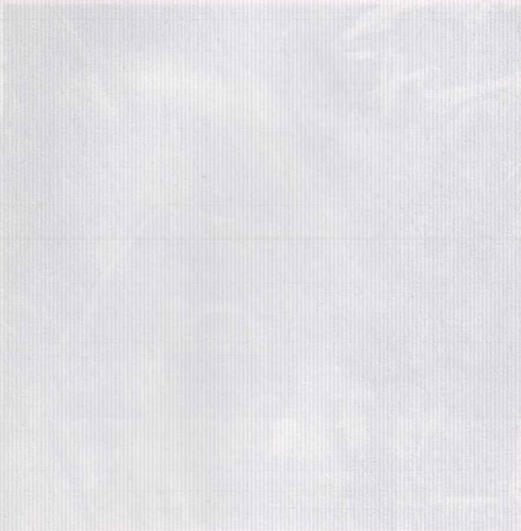
Removing and installing engine

Vehicles with engine code letters WC, WE, WG

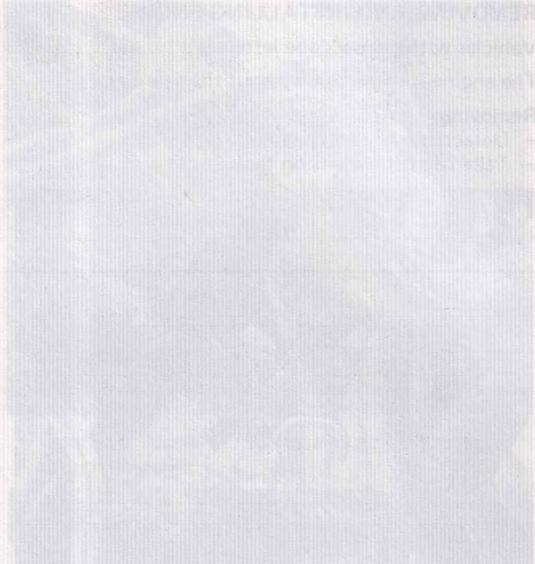
Mounting engine on repair stand

Aligning engine and gearbox

Removing and installing engine 10



Remove the engine cover. Leave the battery connected.



Disconnect the wiring from the alternator terminals 4 and 18.

10 Removing and installing engine

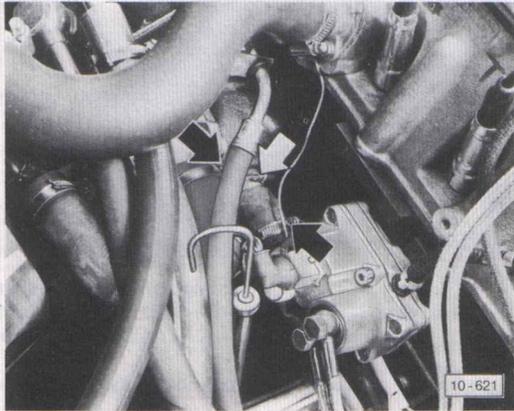
REMOVING AND INSTALLING ENGINE

Vehicles with engine code letters WJ

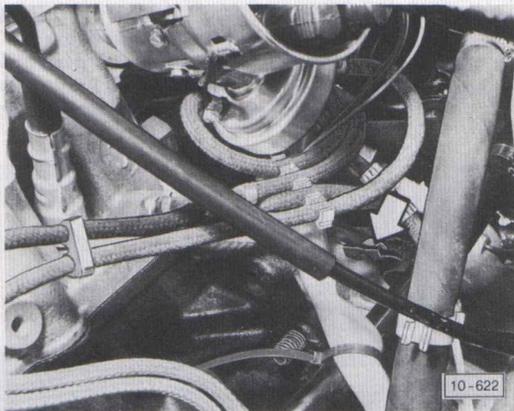
The engine is lifted out without the gearbox.

Removing:

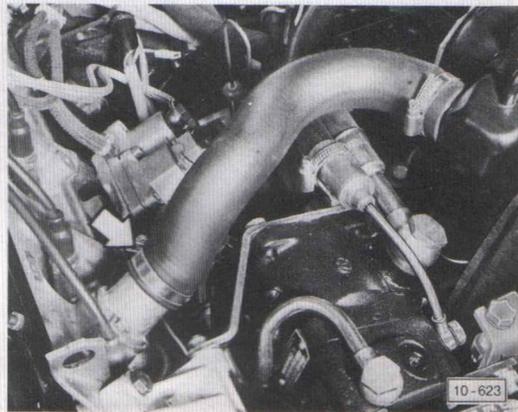
- Detach battery earth strap.
- Take cap off expansion tank.



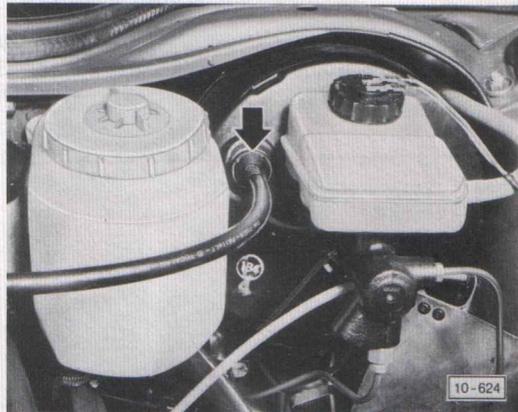
- Drain coolant by detaching coolant hose from thermostat housing and coolant pipe. Catch coolant for later use.



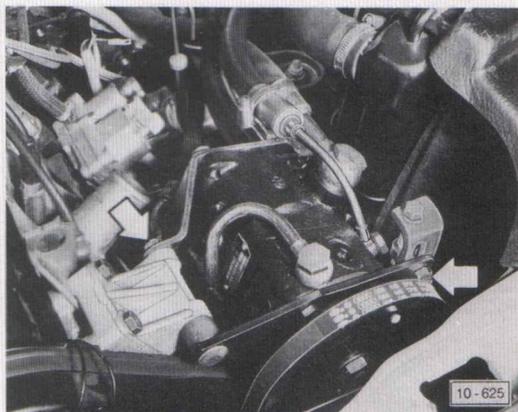
- Remove mounting screw from coolant pipe.



- Detach top hose from engine.
- Disconnect plug from thermostat.
- Detach heater hose from engine block.



- Disconnect vacuum hose from brake servo.



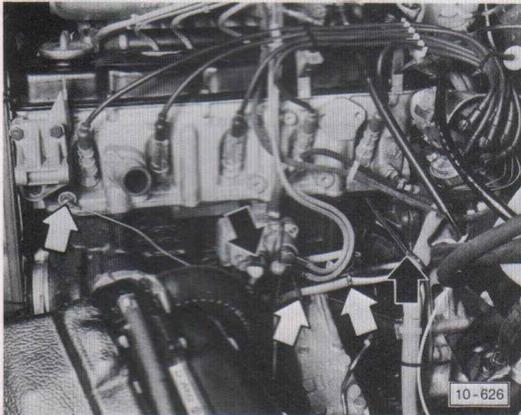
- Vehicles with power assisted steering
- Remove impeller pump for PAS.

Note:

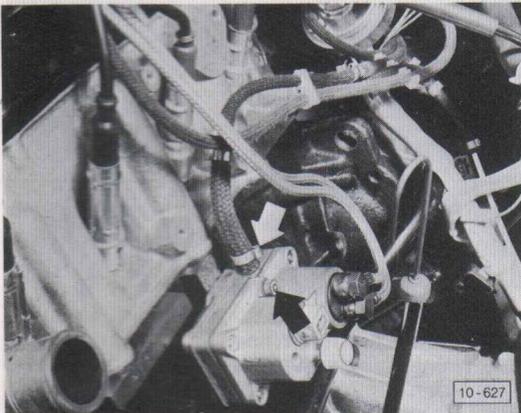
Leave hoses connected.

Removing and installing engine 10

- Take off impeller pump belt.
- Place impeller pump in plenum chamber.

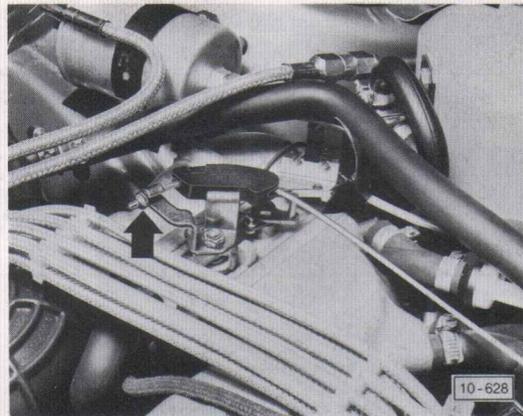


- Disconnect wire from temperature sender unit.
- Disconnect plug from warm-up valve.
- Move harness clear.
- Disconnect plug from oil pressure switch.

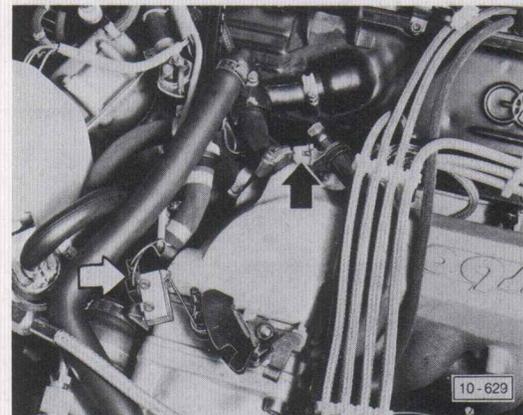


- Remove warm-up valve.

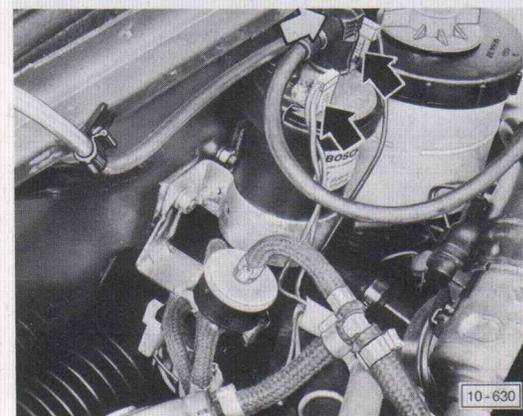
- Note:**
- Leave fuel lines connected.
 - Detach vacuum hose.



- Disengage accelerator cable and pull through support bracket.



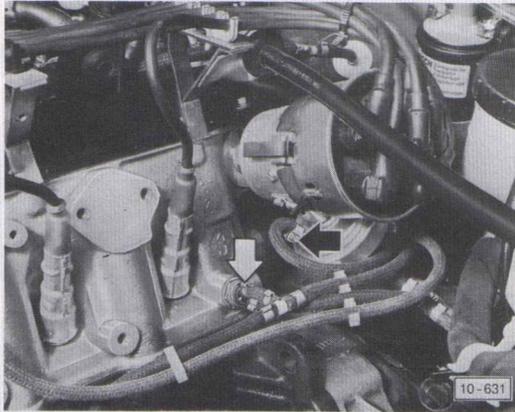
- Detach windshield washer container and disconnect wire.
- Disconnect wiring from throttle switch, cold start valve and auxiliary air valve.
- Unscrew wire from thermostatic regulator valve.



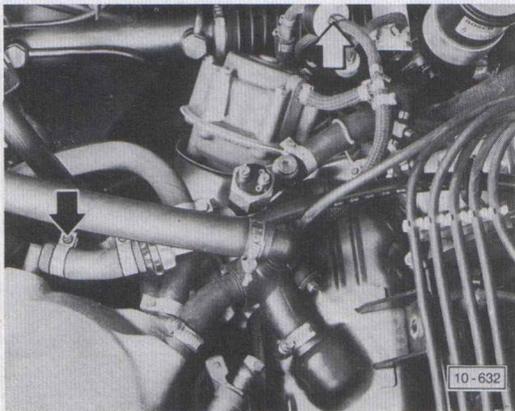
- Disconnect wiring from ignition coil, terminals 1, 4 and 15.

10 Removing and installing engine

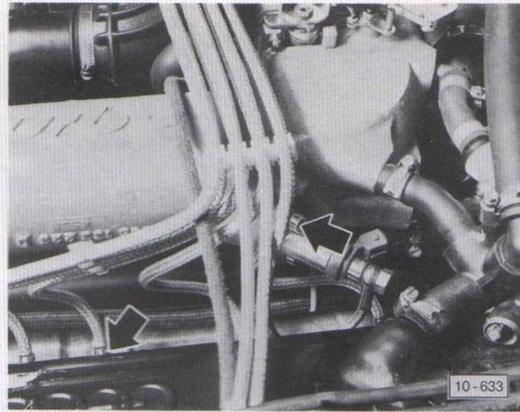
- Disconnect plug from two-way valve (straight connection).
- Disconnect plugs from thermo time switch, temperature sender unit and Hall generator on distributor; move wiring harness clear.



- Disconnect vacuum hoses from thermopneumatic valve and vacuum retard unit on distributor.
- Unscrew thermopneumatic valve from cylinder head.
- Take off distributor cap.



- Disconnect vacuum hose from intake manifold and delay valve.

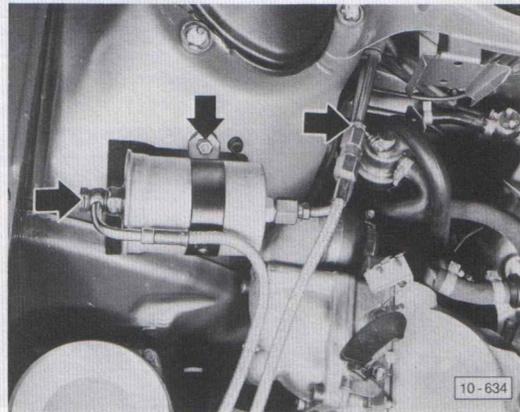


- Pull injectors out of their seats and remove cold start valve.

Note:

Leave fuel lines connected.

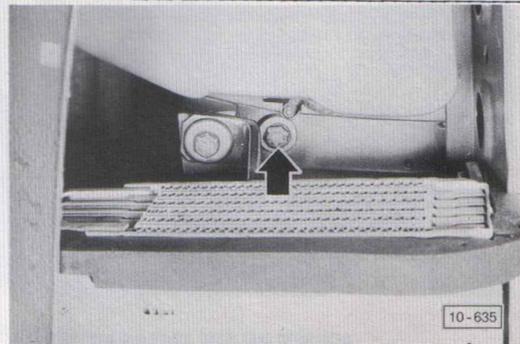
- Remove air intake duct and turbocharger connecting pipe.



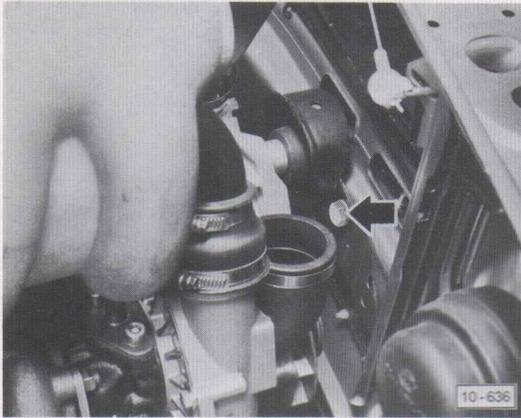
- Disconnect fuel return line.
- Detach fuel line at fuel filter (supply line).
- Detach fuel filter from wheelhousing.

Important

Plug fuel connections to protect them from dirt.



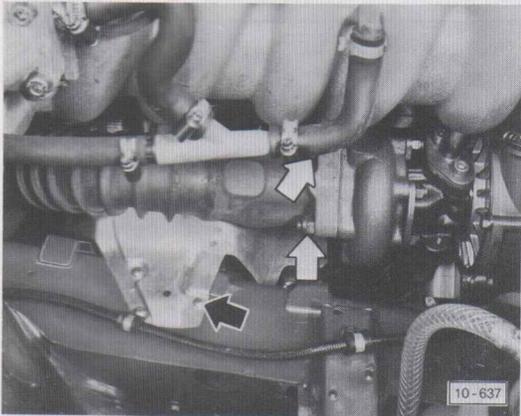
- Remove mixture control unit and air cleaner housing complete and lay aside. First detach lower mounting.



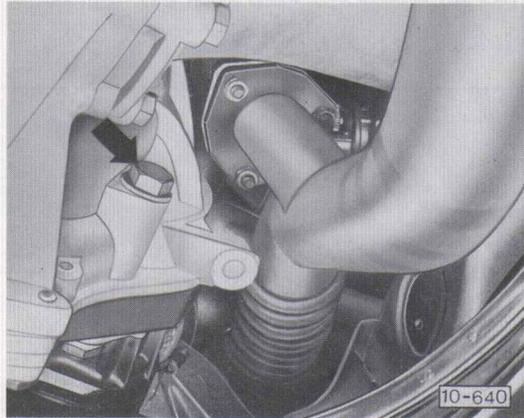
- Detach front stop from cross member I.
- Unscrew top engine/gearbox mounting bolts, leaving one easily accessible bolt in place.



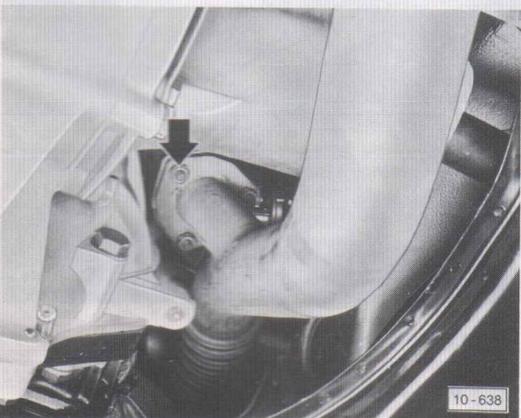
- Detach exhaust pipe at gearbox bracket and front silencer.



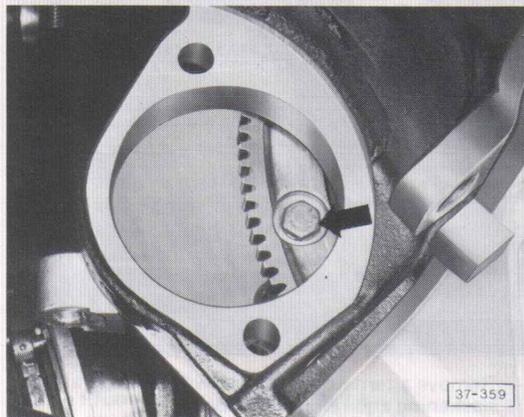
- Detach front exhaust pipe at turbocharger.
- Detach cover plate.



- Remove starter and secure clear to one side, leaving wiring connected.
- Unscrew wire from oil temperature sender unit.

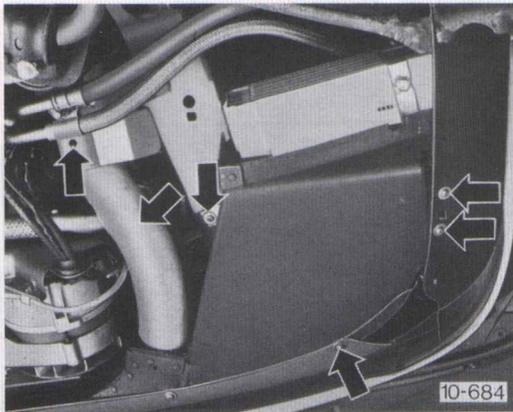


- Detach exhaust pipe from waste gate.

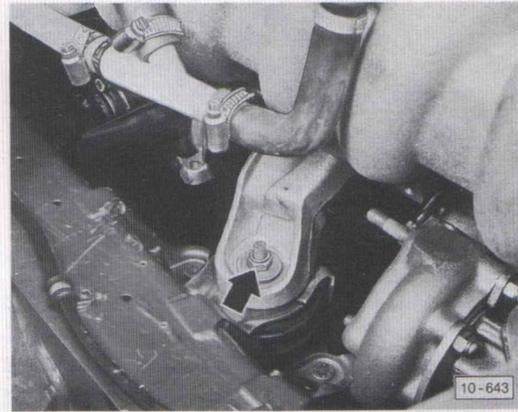


- Vehicles with automatic gearbox:**
 Detach torque converter

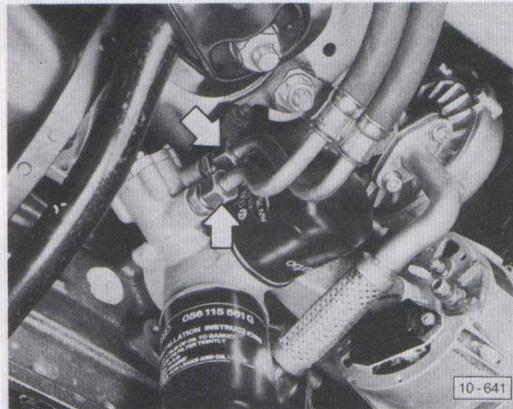
10 Removing and installing engine



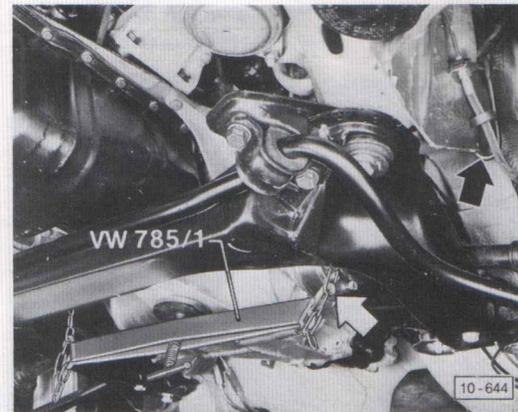
- Remove cover for oil cooler and cooling hose for engine mount.



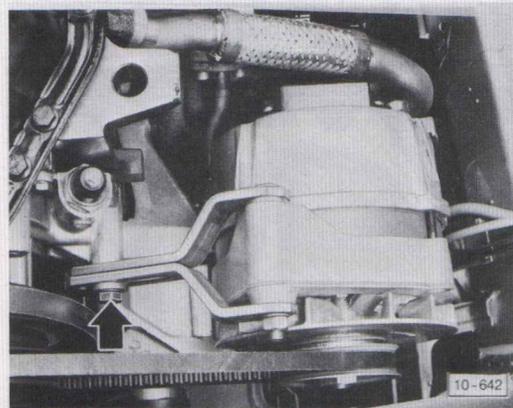
- Detach left and right engine bearer/engine mount attachments.



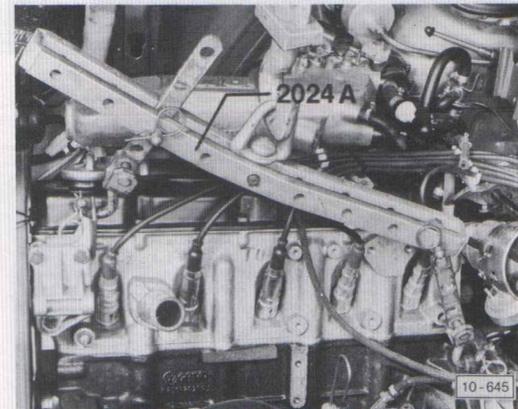
- Detach oil lines going to oil cooler.
- Remove bottom engine/gearbox mounting bolts.



- Attach gearbox support.



- Remove alternator complete with bracket after slackening and removing V-belt.
- Secure alternator clear to one side, leave wiring connected.



- Attach lifting bar:
position 3 – hole 2
position 8 – hole 4

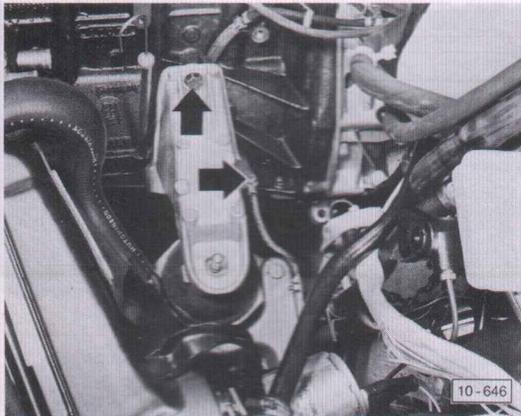
Note:

To ensure that the engine lifts properly the hooks must be attached in the right hole and the right position. The positions marked 1 – 4 on the cross bar must be towards the pulley end. The holes in the hook bars are counted from the hook end.

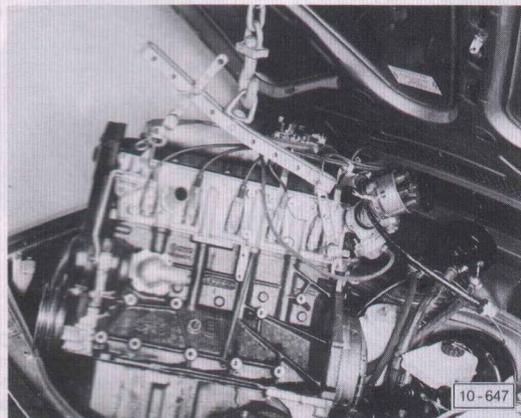
12 Removing and installing engine

Vehicles with engine code letters WJ

Removing and installing engine 10



- Remove left engine bearer.
- Detach earth cable.
- Lift engine.
- Adjust gearbox support to take up weight.
- Remove upper engine/gearbox mounting bolt.
- Separate engine from gearbox.
- Lift engine until waste gate is above top of bulk-head.



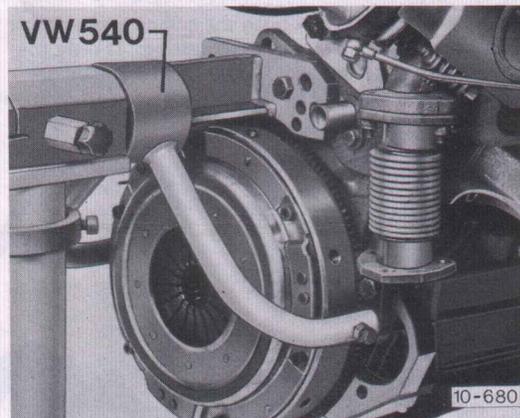
- Lift engine further, at the same time turning it to the right, and then lift right out.

Caution

When the engine is lifted out it must be guided carefully to prevent damage to the input shaft, clutch and body.

The clutch pedal must not be depressed when the engine is out, otherwise the slave cylinder can be pressed past its end position.

Mounting engine on repair stand



- To facilitate work on the engine it should be mounted on a repair stand with bracket VW 540.

Important

Do not measure the cylinder bores (see repair group 13) with the engine mounted on the repair stand because this causes a certain amount of distortion.

Installing:

Install the engine in reverse sequence.

Tighten the engine/engine mount and engine mount/subframe attachments with the engine idling.

Note the following points when installing the engine:

- Check clutch release bearing for wear, renew if necessary.
- Lightly lubricate clutch release bearing and input shaft splines with MoS₂ grease.
- Always renew self-locking nuts.
- Adjusting accelerator cable — page 82
- Filling cooling system — page 51
- Aligning exhaust system free of strain — page 85

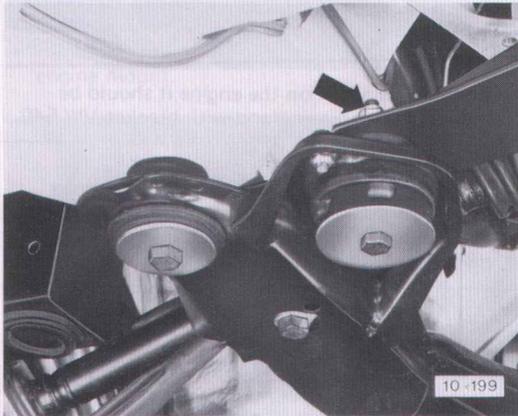
Tightening torques:

1 - Engine to gearbox		
	M 8:	30 Nm
	M 10:	45 Nm
	M 12:	60 Nm
2 - Torque converter to drive plate		30 Nm
3 - Exhaust pipe to gearbox bracket		30 Nm
4 - Exhaust pipe to manifold		30 Nm
5 - Subframe to body		110 Nm
6 - Air conditioner compressor bracket to engine		40 Nm
7 - Torque support to engine		45 Nm
8 - Engine support to engine mount		45 Nm
9 - Pipe connection to engine		20 Nm
10 - Front stop to cross member I		45 Nm
11 - Alternator bracket to engine M 8		20 Nm
12 - Alternator to bracket M 8		20 Nm
13 - Warm-up valve to engine		20 Nm
14 - PAS impeller pump		20 Nm

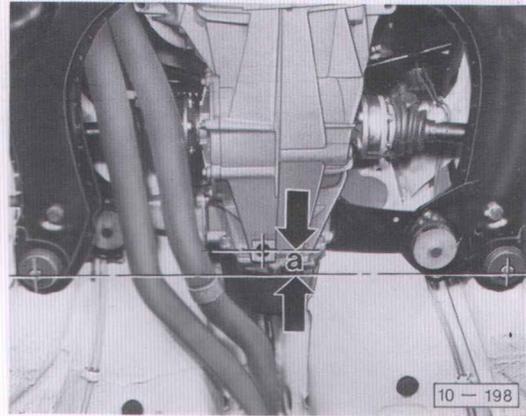
10 Removing and installing engine

ALIGNING ENGINE AND GEARBOX

This is only necessary if **both** the engine and gearbox have been detached from the mountings. If **only** the engine has been removed, tighten the engine bearer/engine mount and engine mount/subframe attachments with the engine idling.



- Loosen both nuts securing gearbox carriers to mountings.



Manual gearbox:

Distance a = 29.4 ± 1.5 mm

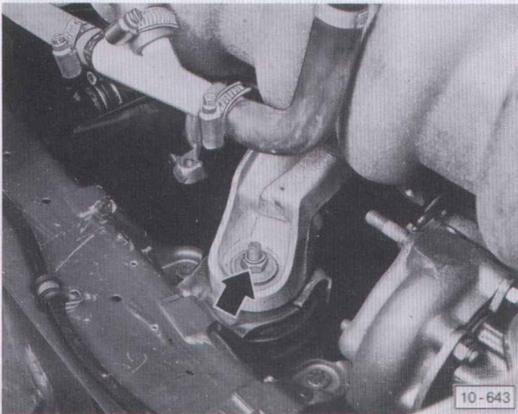
Automatic gearbox:

Distance a = 127.4 ± 1.5 mm

- Move the engine and gearbox in longitudinal direction by shaking them on the mountings.

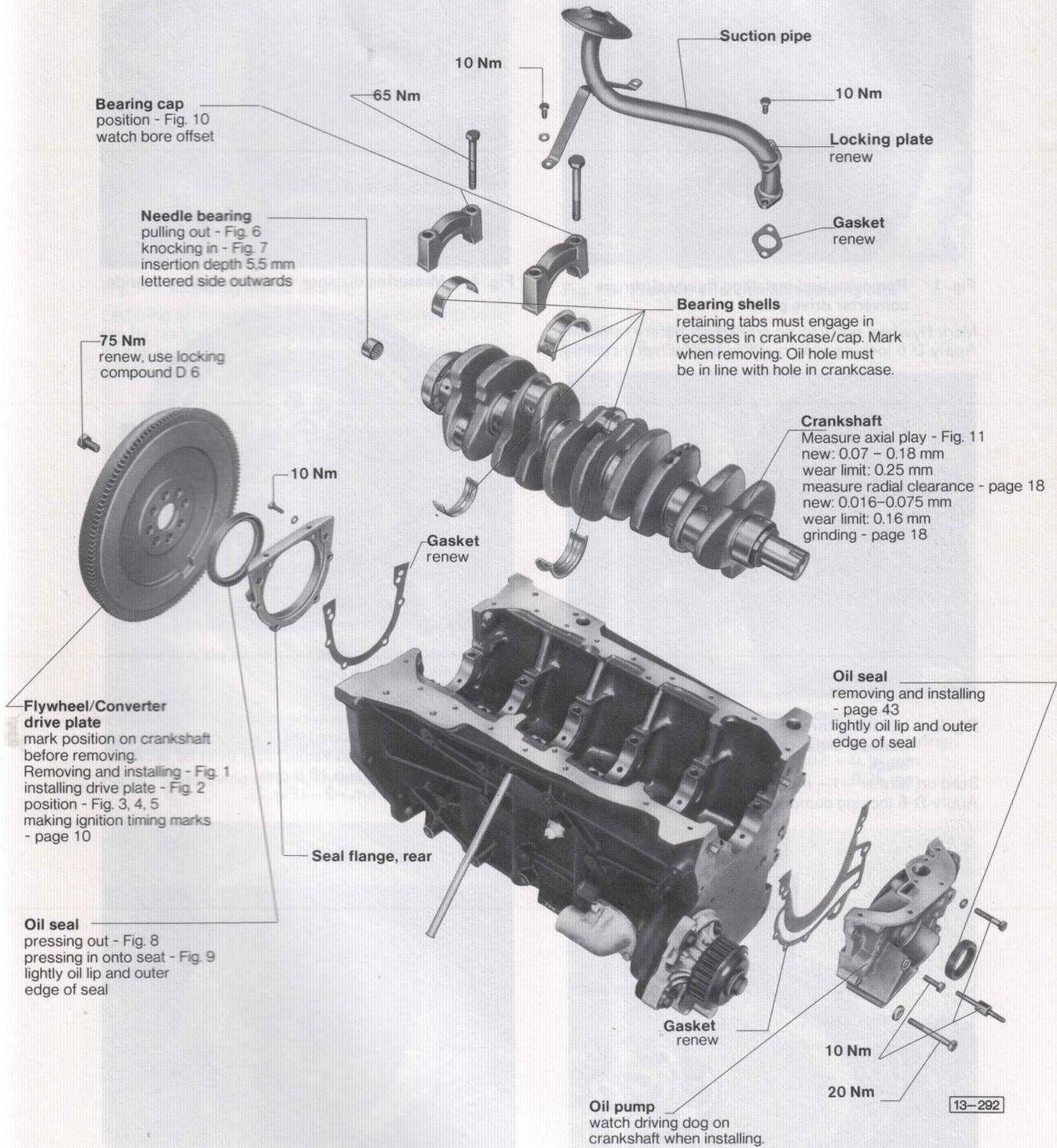
Note:

The engine and gearbox cannot be adjusted laterally or vertically.



- Loosen left and right engine bearer/engine mount attachments.

REMOVING AND INSTALLING CRANKSHAFT AND FLYWHEEL



13 Crankshaft group

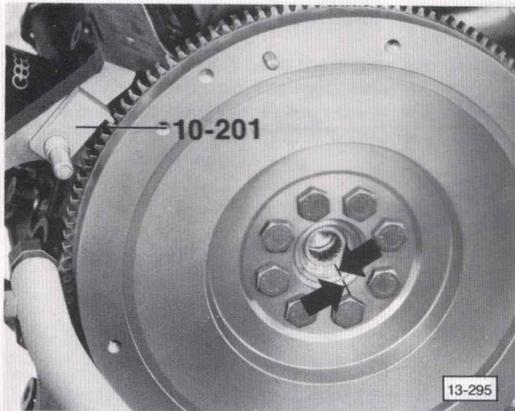


Fig. 1 Removing and installing flywheel/torque converter drive plate

Mark flywheel position on crankshaft before removing. Apply D 6 locking compound to bolts when installing.

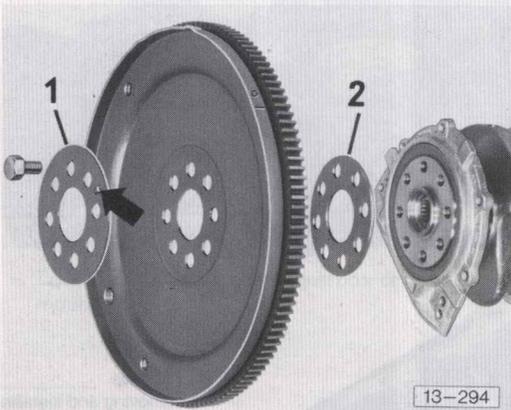


Fig. 2 Installing torque converter drive plate: first measure distance from drive plate to engine block

Bead on washer —1— must face towards torque converter. Apply D 6 locking compound to bolts when installing.



Fig. 3 Measuring distance from drive plate, inside

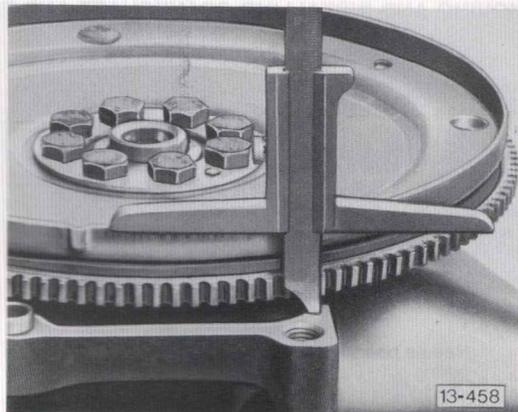


Fig. 4 Measuring distance from drive plate, outside

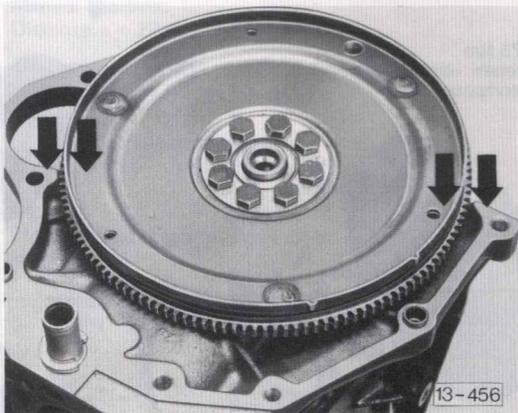


Fig. 5 Measure distance from drive plate to engine block in two places

Calculating distance:

Distance measured outside minus distance measured inside gives the required distance. Take the average of the two measured values. This must be between 17.2 and 18.8 mm. Otherwise fit shim —2— (Fig. 2).

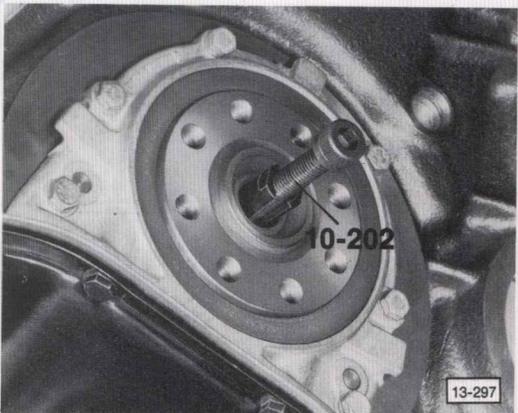


Fig. 6 Removing needle bearing

16

Removing and installing crankshaft, flywheel

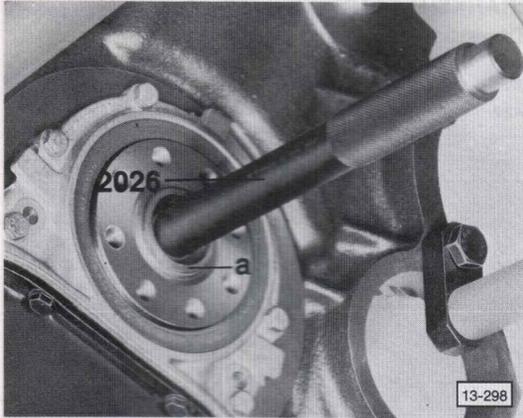


Fig. 7 Installing needle bearing

Lettering on needle bearing must face outwards so it can be read when bearing is installed. Knock in to a depth of 5.5 mm (measured from surface —a— to needle bearing).

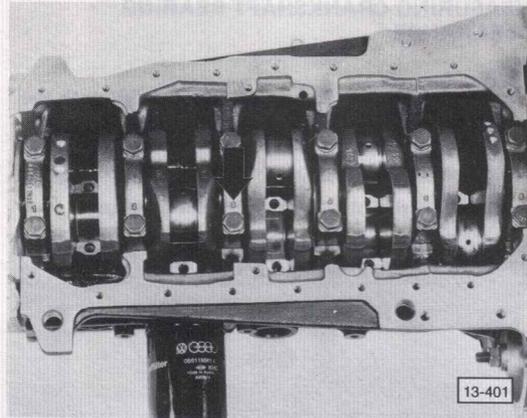


Fig. 10 Position of crankshaft bearing caps

Bearing —1— pulley end
Bearing —6— flywheel end

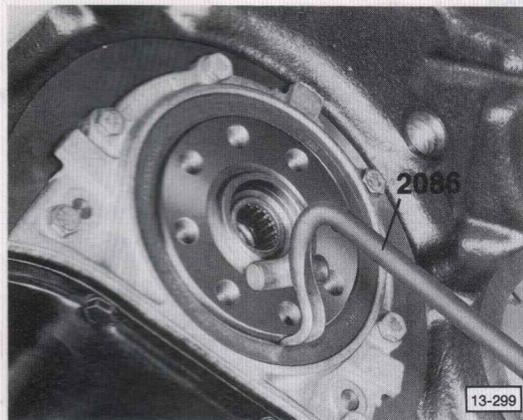


Fig. 8 Removing oil seal, flywheel end

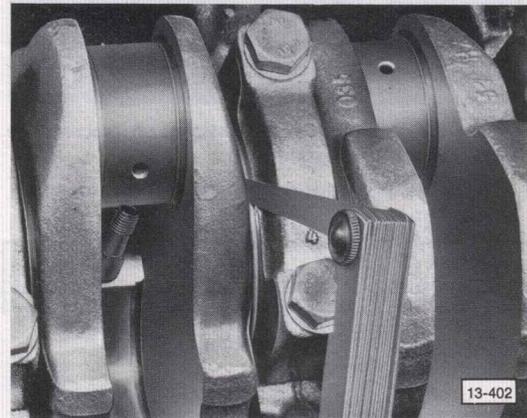


Fig. 11 Measuring axial play of crankshaft

Measure axial play at no. 4 bearing (thrust bearing).
Clearance when new 0.07 – 0.18 mm
Wear limit 0.25 mm



Fig. 9 Installing oil seal, flywheel end

Lightly oil sealing lip and outer rim of oil seal before installing.

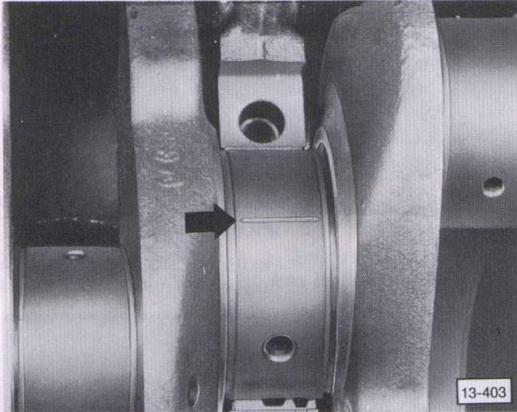
13 Crankshaft group

MEASURING CRANKSHAFT BEARING CLEARANCE

Note:

The bearing clearance can also be measured with the engine installed, using Plastigage.

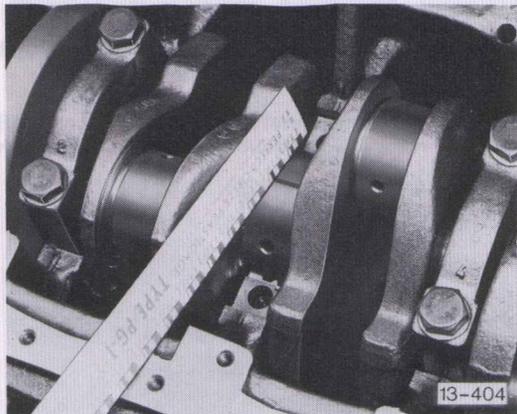
- Remove crankshaft bearing cap.
- Clean bearing shell and crankshaft journal.



- Place a suitable length of Plastigage strip across the journal or in the bearing cap.
- Fit crankshaft bearing cap with shell and torque to 65 Nm.

Caution

Do not turn crankshaft.



- Compare width of Plastigage strip with measuring scale.

New: 0.016 – 0.075 mm
Wear limit: 0.16 mm

Fig. 3 Measuring distance from drive plate mark

CRANKSHAFT UNDERSIZES

(Dimensions in mm)

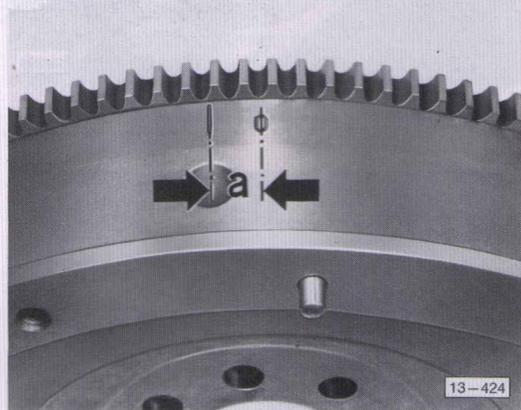
Size	Main journal dia.	Crankpin dia.
Standard	58.00 -0.022 -0.042	46.00 -0.022 -0.042
1st undersize	57.75 -0.022 -0.042	45.75 -0.022 -0.042
2nd undersize	57.50 -0.022 -0.042	45.50 -0.022 -0.042
3rd undersize	57.25 -0.022 -0.042	45.25 -0.022 -0.042

MAKING IGNITION TIMING MARK ON FLYWHEEL

Replacement flywheels and drive plates have only a TDC mark – 0 –.

When a new flywheel or drive plate is fitted the appropriate ignition timing mark (notch) must be made on the replacement part. This involves measuring the length of the arc.

Engines with code letters WC, WG only



Up to and including 1979 model year

- Mark off notch for ignition timing 12.1 mm (a) to the left of the centre of the TDC mark.

From 1980 model year onwards

- Mark off notch for ignition timing 14.5 mm (a) to the left of the centre of the TDC mark.

Fig. 5 Removing needle bearing

18

Removing and installing crankshaft, flywheel

Measuring crankshaft bearing clearance

Crankshaft undersizes

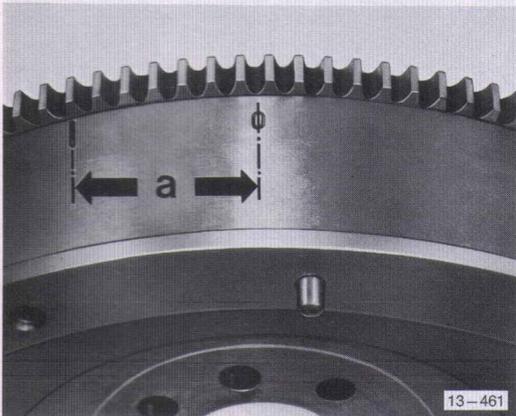
Making ignition timing mark

Engines with code letters WE only



- Mark off notch for ignition timing 7.3 mm (a) to the right of the centre of the TDC mark.

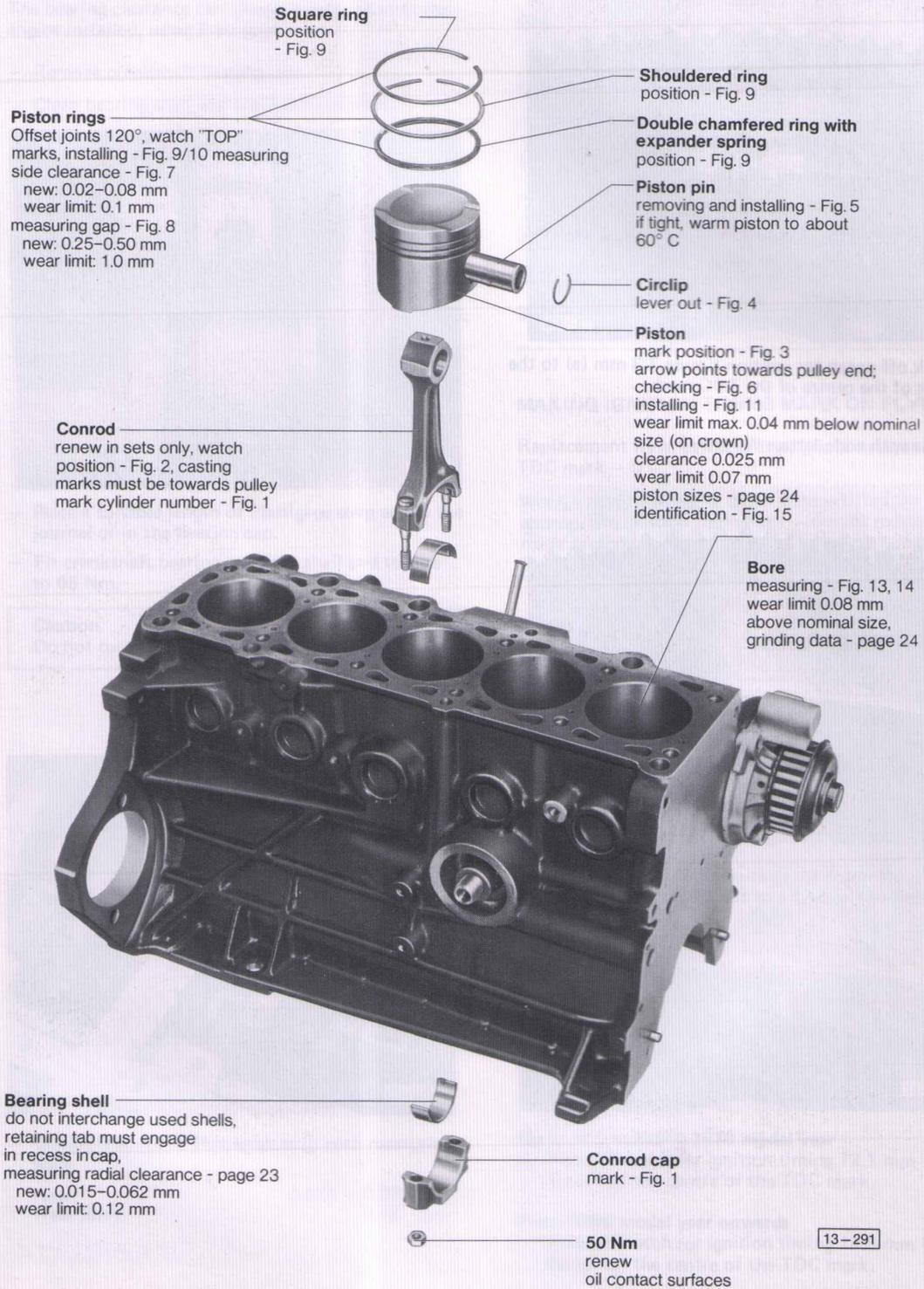
Engines with code letters WJ only



- Mark off notch for ignition timing 51.6 mm (a) to the left of the centre of the TDC mark.

13 Crankshaft group

REMOVING AND INSTALLING PISTONS AND CONRODS



13-291