

DIESEL

Fuel Injection



Troubleshooting

Rabbit

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Second Edition

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How does this Troubleshooting guide work?

Together with the necessary tools and equipment this guide should help you to quickly locate and eliminate troubles.

Finding your way:

- verify complaint (check customer's complaint to determine if a problem really exists.) Road test and if possible have customer show you what happens.
- find symptoms in table of contents
- turn to proper page

How to check:

Symptom (example)

- be sure test conditions check out OK

- upper box lists most probable trouble

- start to check here

- result of check

— go to next box or follow arrow until trouble is found and corrected

Engine does not start

- no mistakes in starting procedure
- check for fuel in tank
- cranking speed at least 150 rpm

No voltage at stop solenoid

- connect test lamp to stop solenoid
- switch ignition on

lamp lights up	lamp does not light up
----------------	------------------------

Possible causes:

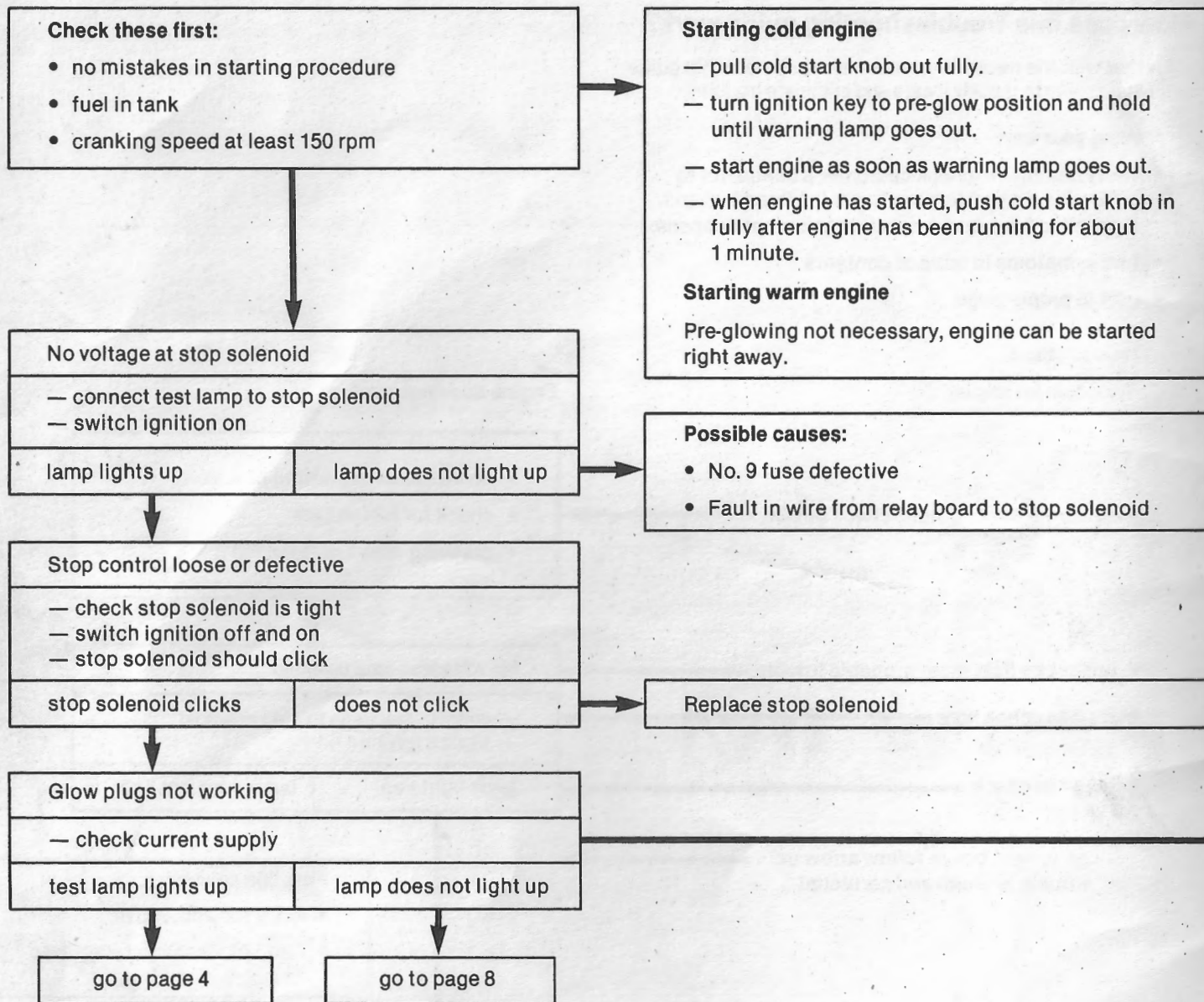
- No. 9 fuse defective
- Fault in wire from relay plate to stop solenoid

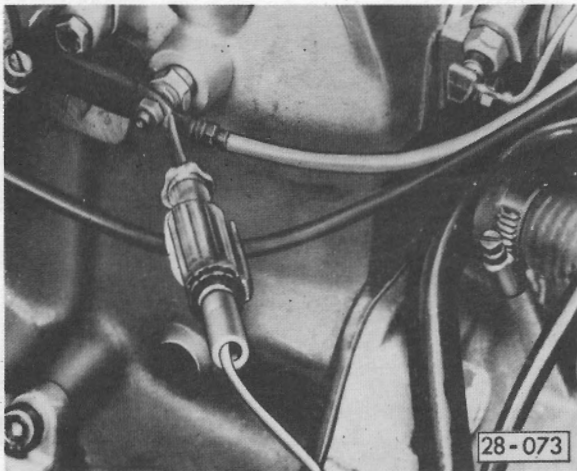
Stop solenoid loose or defective

- check stop solenoid for tight fit

stop solenoid clicks	does not click
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Engine difficult to start or does not start

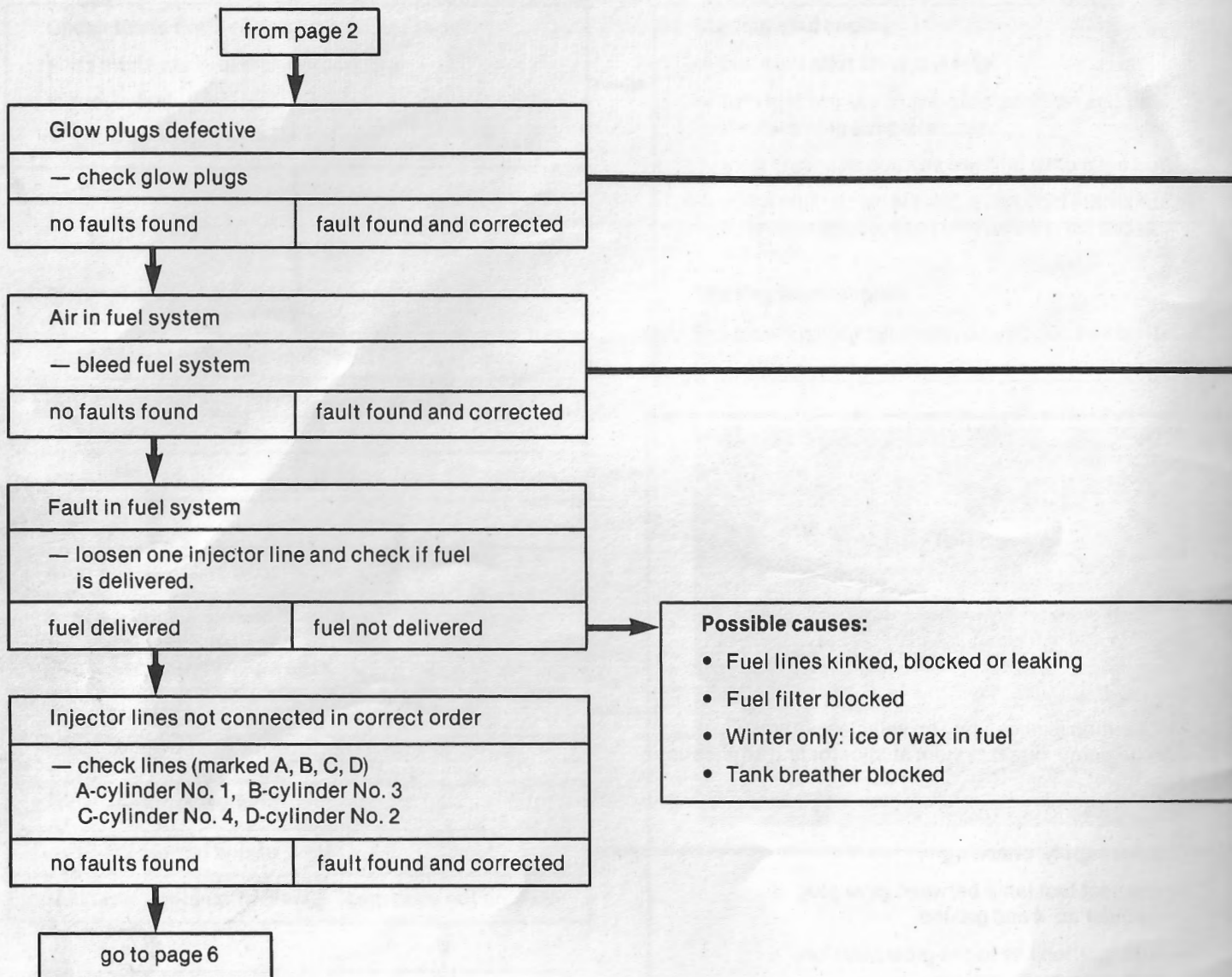




Current supply, checking

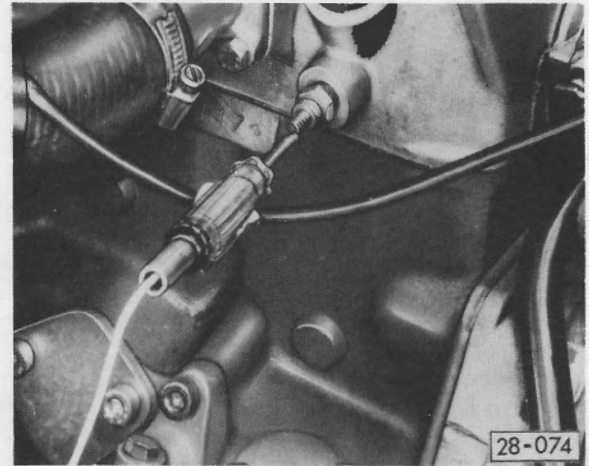
- connect test lamp between glow plug of cylinder no. 4 and ground
- turn ignition key to pre-glow position, test lamp must light up

Engine difficult to start or does not start



Glow plugs, checking

- remove glow plug wire and busbar
- connect test lamp to positive connector of battery and in turn to each plug
- lamp lights up — glow plug OK
- lamp does not light up — glow plug not OK



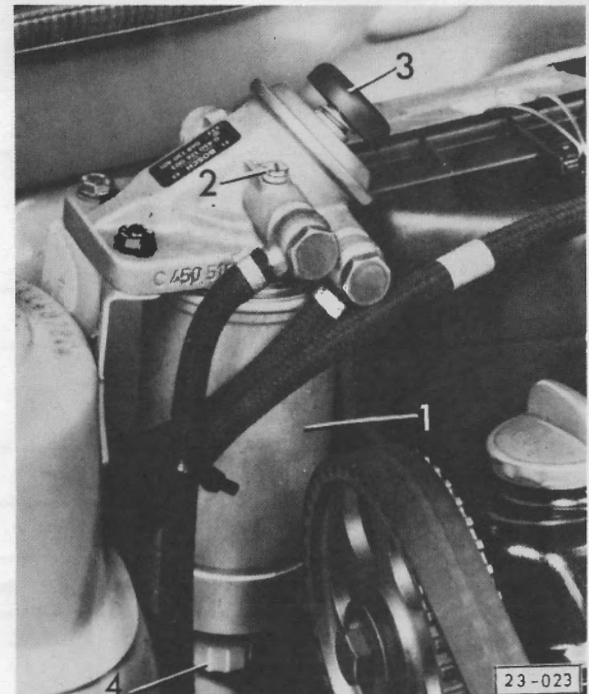
Fuel system, bleeding

Note

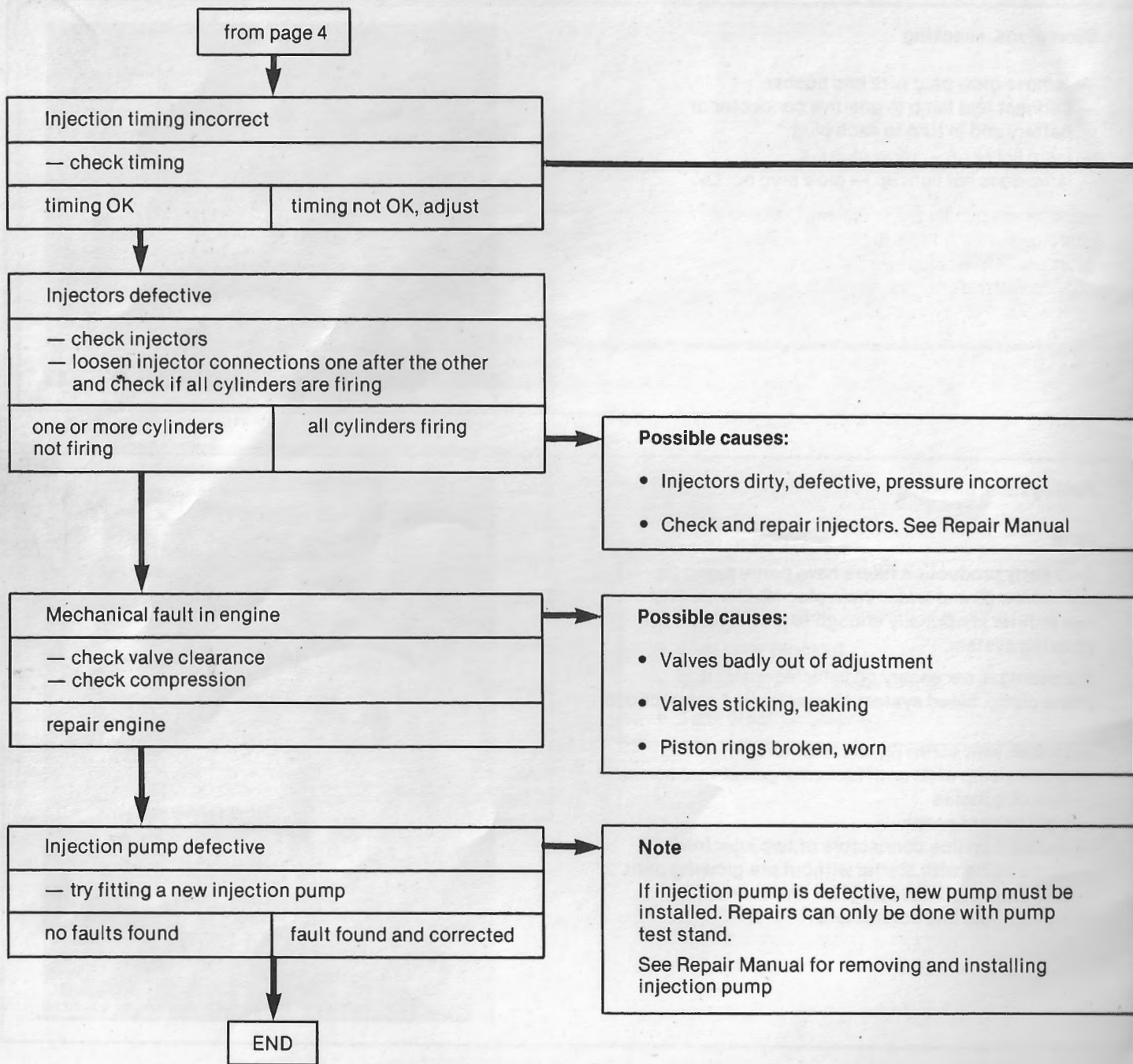
Only early production filters have prime pump (3), vent screw (2) and water drain plug (4). Remaining fuel in filter is normally enough to prevent air from entering system.

If bleeding is necessary on vehicles without prime pump, bleed system at injector line connections

- loosen vent screw (2) on top of filter
- prime pump at (3) until fuel emerges at vent screw free of bubbles
- tighten vent screw
- loosen fuel line connectors of two injectors
- turn engine with starter without pre-glows until fuel emerges from open fuel line connectors
- tighten fuel line connectors

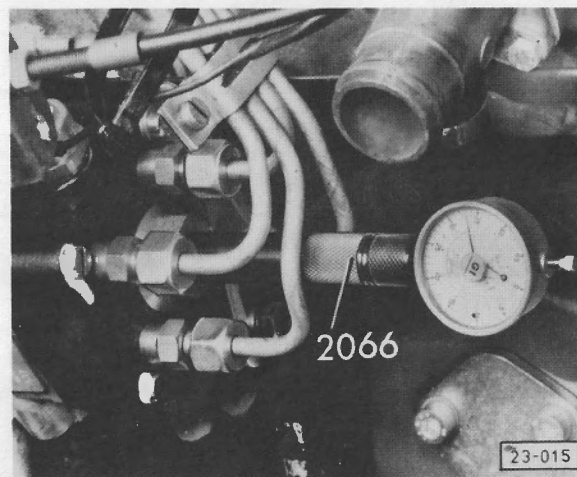


Engine difficult to start or does not start



Injection timing, checking

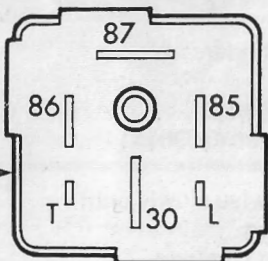
- set engine to TDC of No. 1 cylinder
- remove plug from plug cover
- install adaptor and small dial gauge (0-3.0 mm/0-0.118 in.) with 2.5 mm (0.098 in.) preload in place of plug
- turn crankshaft counter clockwise slowly until dial gauge needle stops moving
- zero gauge with 1 mm (0.039 in.) preload
- turn crankshaft clockwise until mark on flywheel is in line with reference mark. Dial gauge should show lift of 0.83 mm (0.032 in.)
- if necessary loosen pump bolts and set lift to 0.83 mm (0.032 in.) by turning pump



Engine difficult to start or does not start

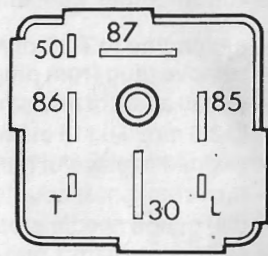
from page 2

No voltage at terminal 30 of glow plug relay	
— connect test lamp to terminal 30 of relay	
Lamp lights up	Lamp does not light up



94-157

through 1977



94-188

from 1978

Possible causes:

- Fault between relay board terminal 30 and relay terminal 30
- Relay board defective, replace

Glow plug relay not working	
— connect lamp to relay terminal 86	
— turn key to glow plug position	
Lamp lights up	Lamp does not light up
Repair connection from relay terminal 85 to ground or replace relay	Repair connection from ignition switch to relay terminal 86 or replace ignition switch

END

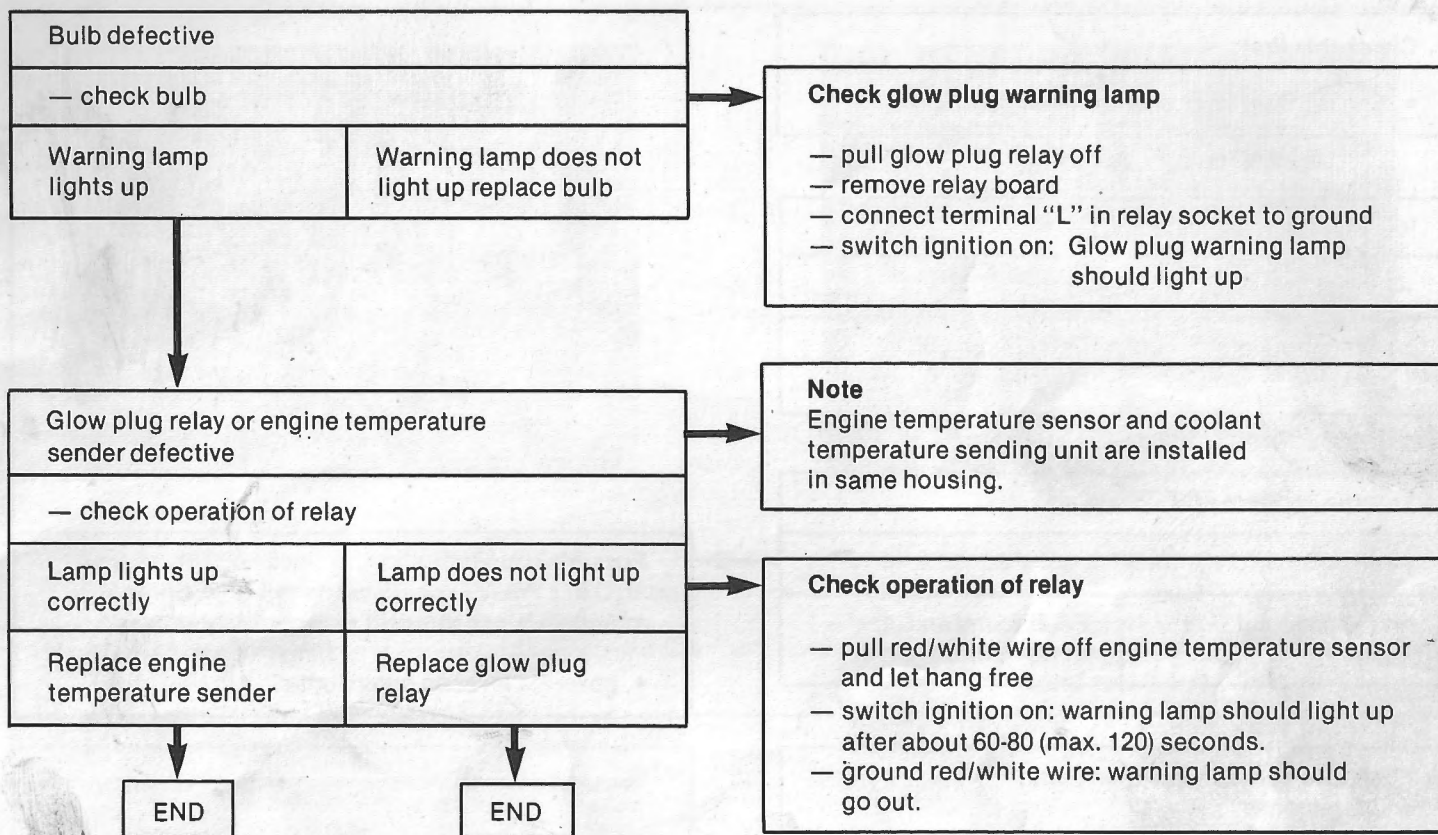
END

From 1978 only

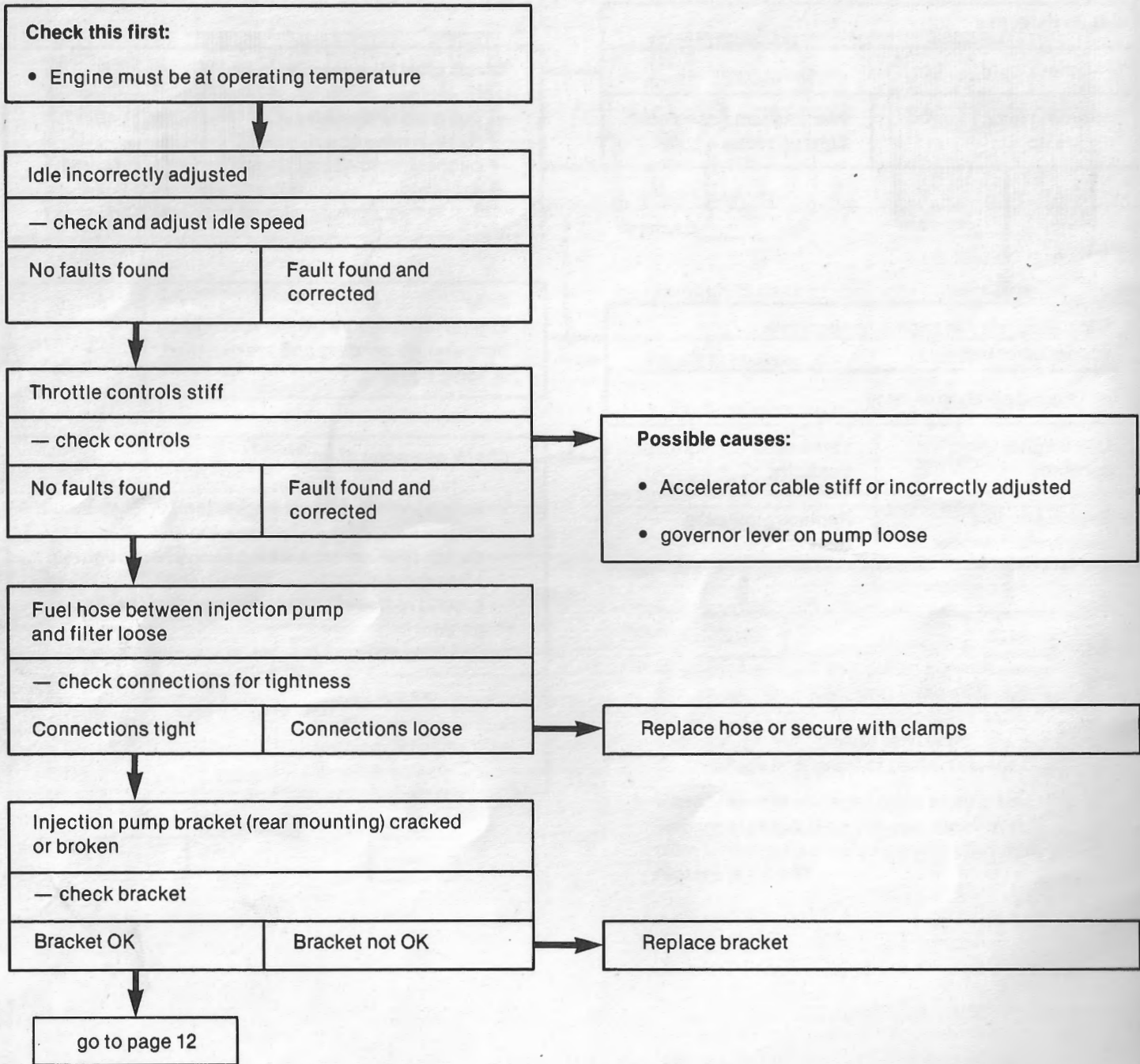
— check glow plugs after lamp went out and during starting

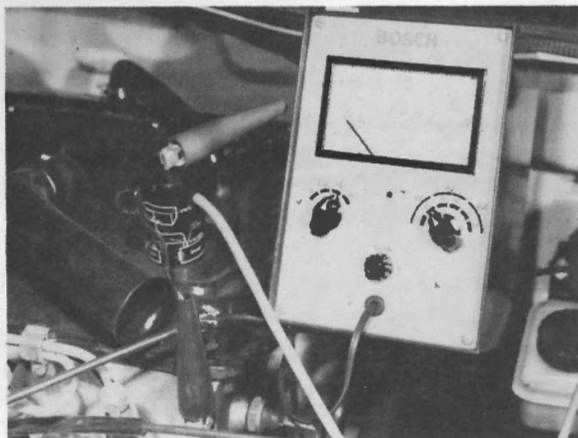
- when temperature controlled preheat period has ended (lamp went out) there should still be voltage at plugs for additional 10 to 25 seconds. Do not operate starter for this test. If no voltage is present at plugs, replace relay
- when starter is engaged there should be voltage at plugs. If no voltage, repair wire from terminal 50 of relay to relay plate and replace relay J 52

Glow plug warning light not working



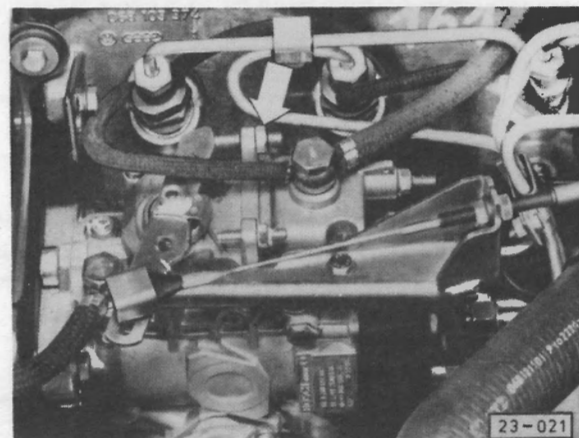
Idle wrong or rough



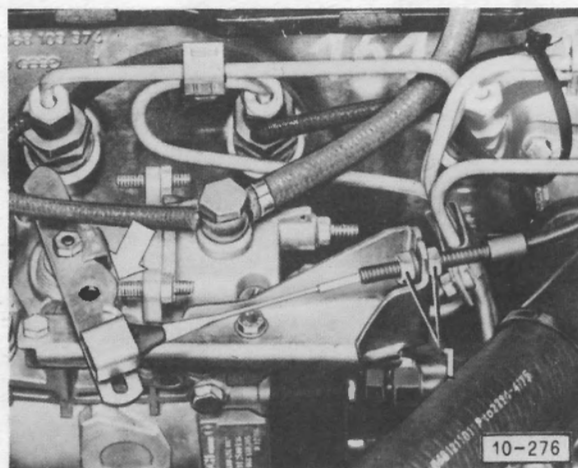


Idle speed, adjusting

- measure idle speed with adapter VW 1324 together with Bosch dwell-tach EWAW 116 C (from console 1 of diagnosis stand) or Sun dwell-tach TDT-12 or equivalent



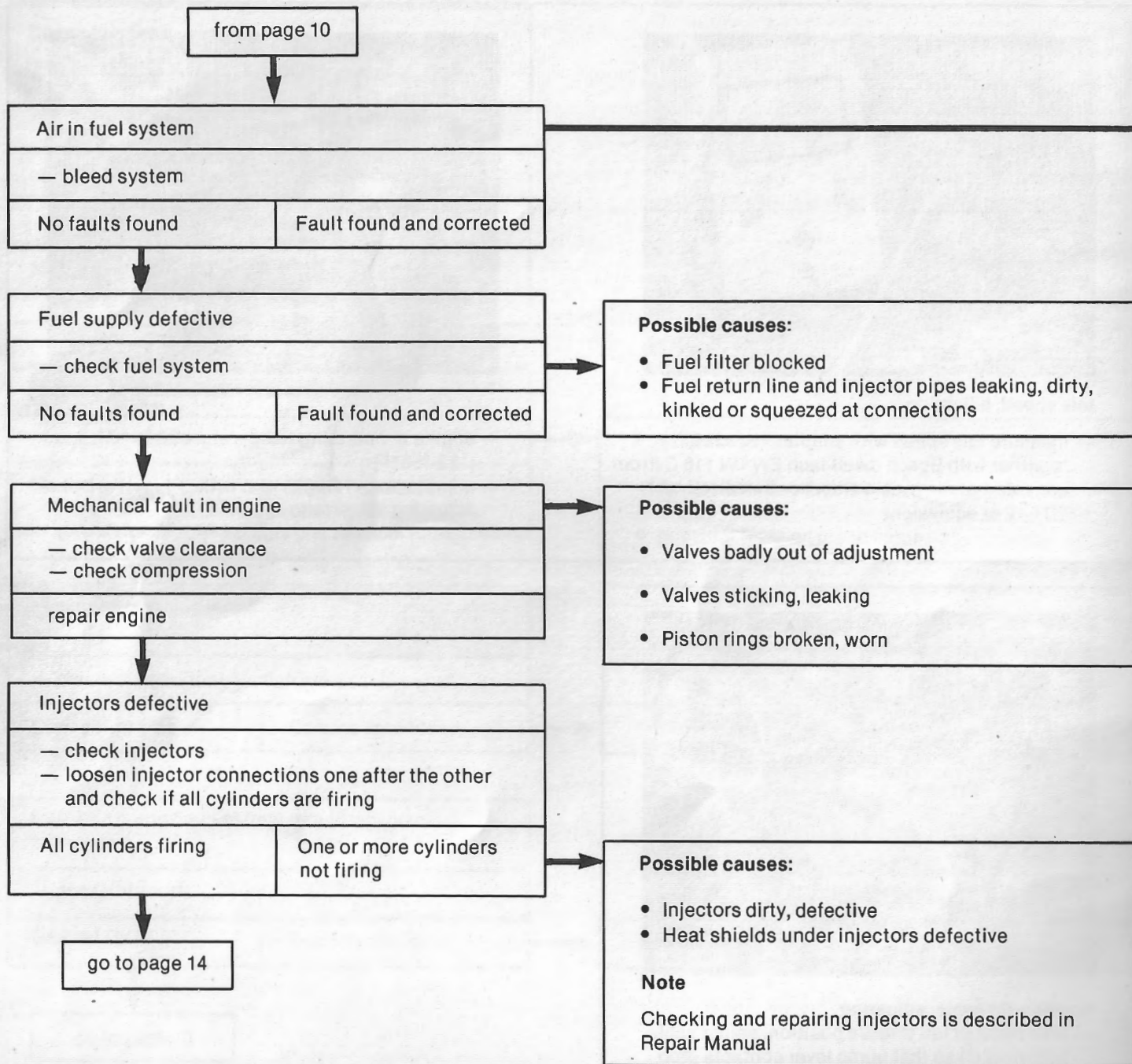
- engine at operating temperature 50-70°C (122-158°F)
- adjust idle to 775-825 rpm with adjusting screw (arrow)
- tighten lock nut and seal it



Accelerator cable, adjusting

- with pedal in full throttle position, adjust cable with nuts (1) so that pump lever contacts stop (arrow) free of strain

Idle wrong or rough



Fuel system, bleeding

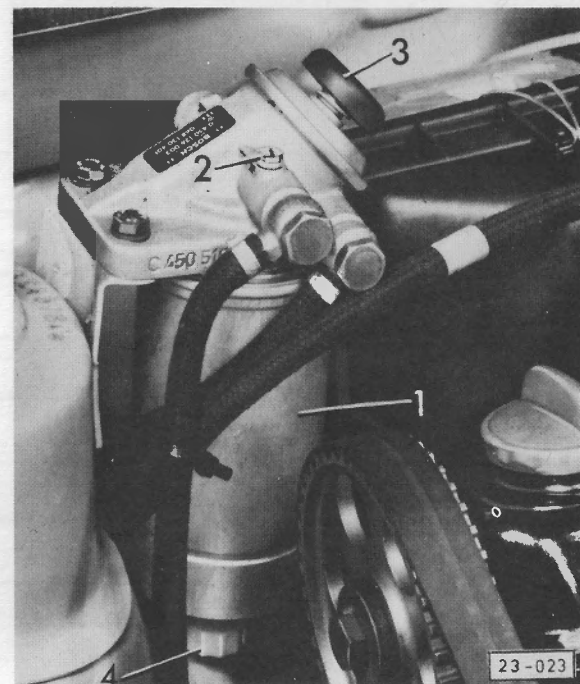
Note

Only early production filters have prime pump (3), vent screw (2) and water drain plug (4). Remaining fuel in filter is normally enough to prevent air from entering system.

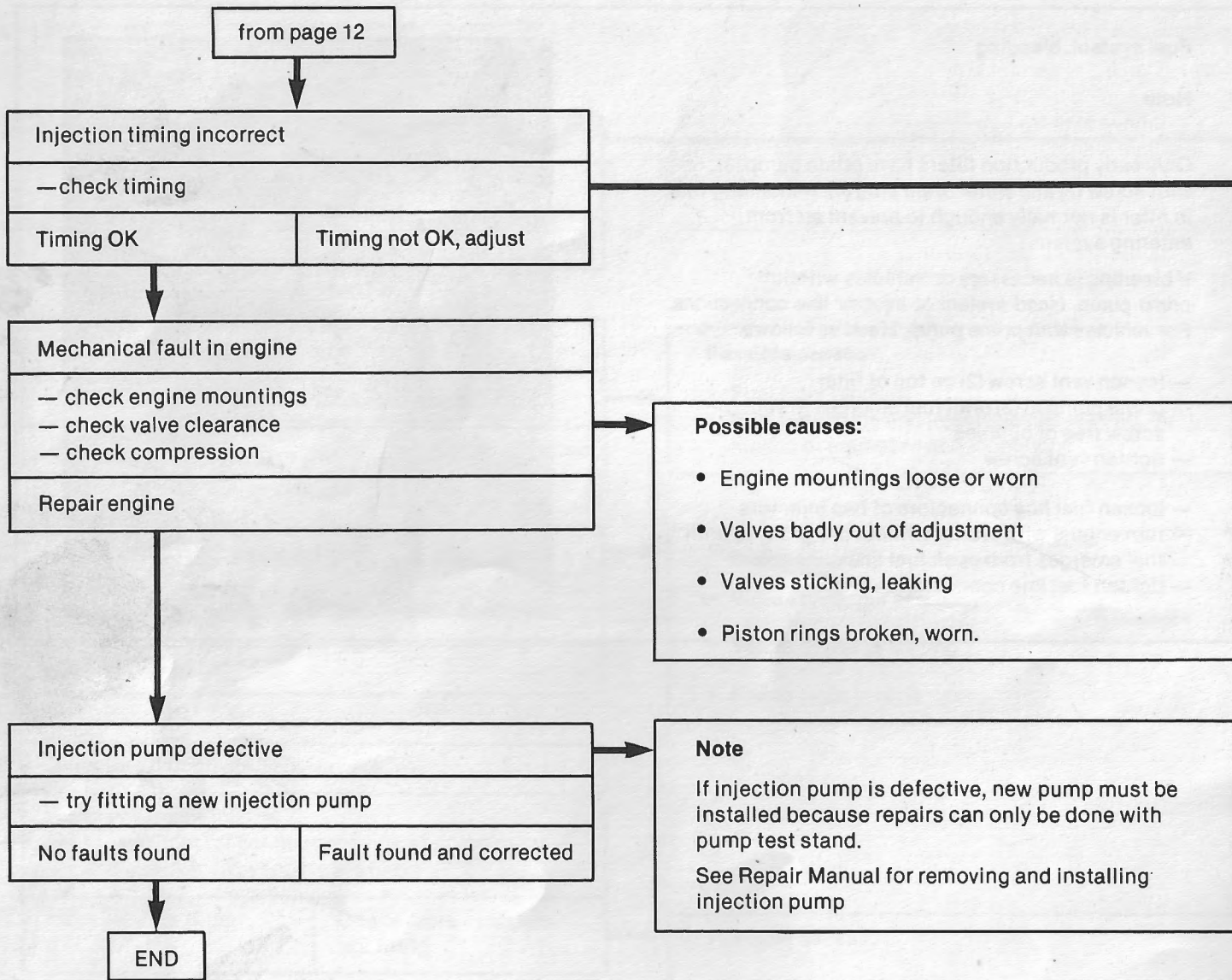
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- tighten vent screw

- loosen fuel line connectors of two injectors
- turn engine with starter without pre-glowing until fuel emerges from open fuel line connectors
- tighten fuel line connectors

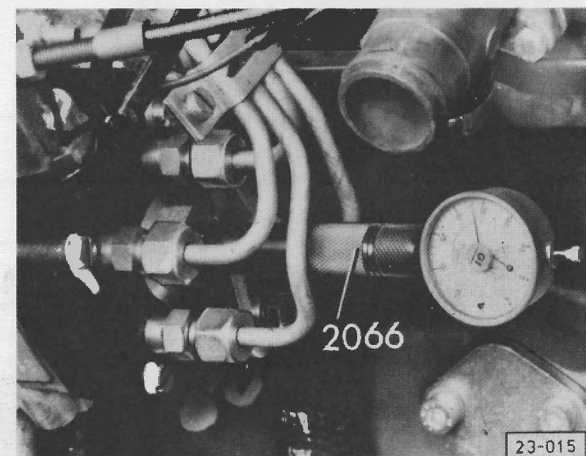


Idle wrong or rough



Injection timing, checking

- push in cold start knob
- set engine to TDC on No. 1 cylinder
- remove plug from plug cover
- install adaptor and small dial gauge (0-3.0 mm/0-0.118 in.) with 2.5 mm (0.098 in.) preload in place of plug
- turn crankshaft counter clockwise slowly until dial gauge needle stops moving
- zero gauge with 1 mm (0.039 in.) preload
- turn crankshaft clockwise until mark on flywheel is in line with reference mark. Dial gauge should show lift of 0.83 mm (0.032 in.)
- if necessary loosen pump bolts and set lift to 0.83 mm (0.032 in.) by turning pump



Exhaust smoke black, white, or blue

Check these first:

- Engine at operating temperature
- Car driven in correct gear (not too low)



Air cleaner or fuel filter dirty	
— clean or renew element, renew fuel filter	
No faults found	Fault found and corrected



Maximum engine speed incorrect	
— check and adjust maximum speed	
No faults found	Fault found and corrected



Injectors defective	
— check injectors	
No faults found	Fault found and corrected



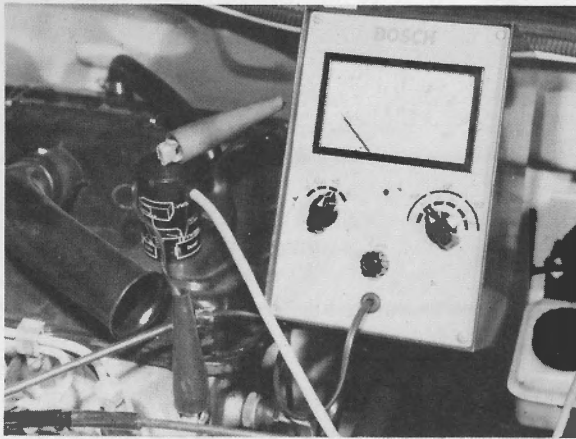
Possible causes:

- Injectors leaking
- Sticking or broken nozzle needles
- Injection pressure too low

Note

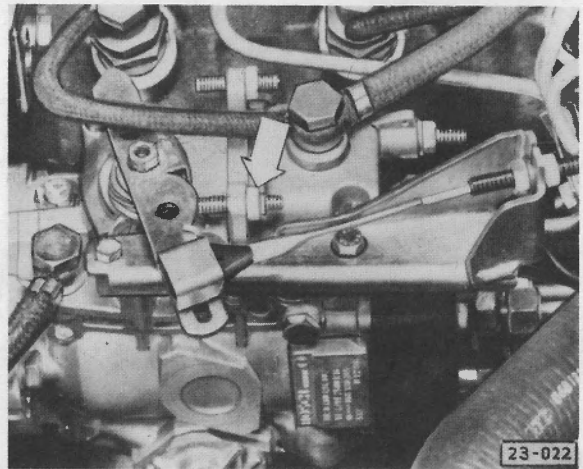
Checking and repairing injectors is described in Repair Manual

go to page 18



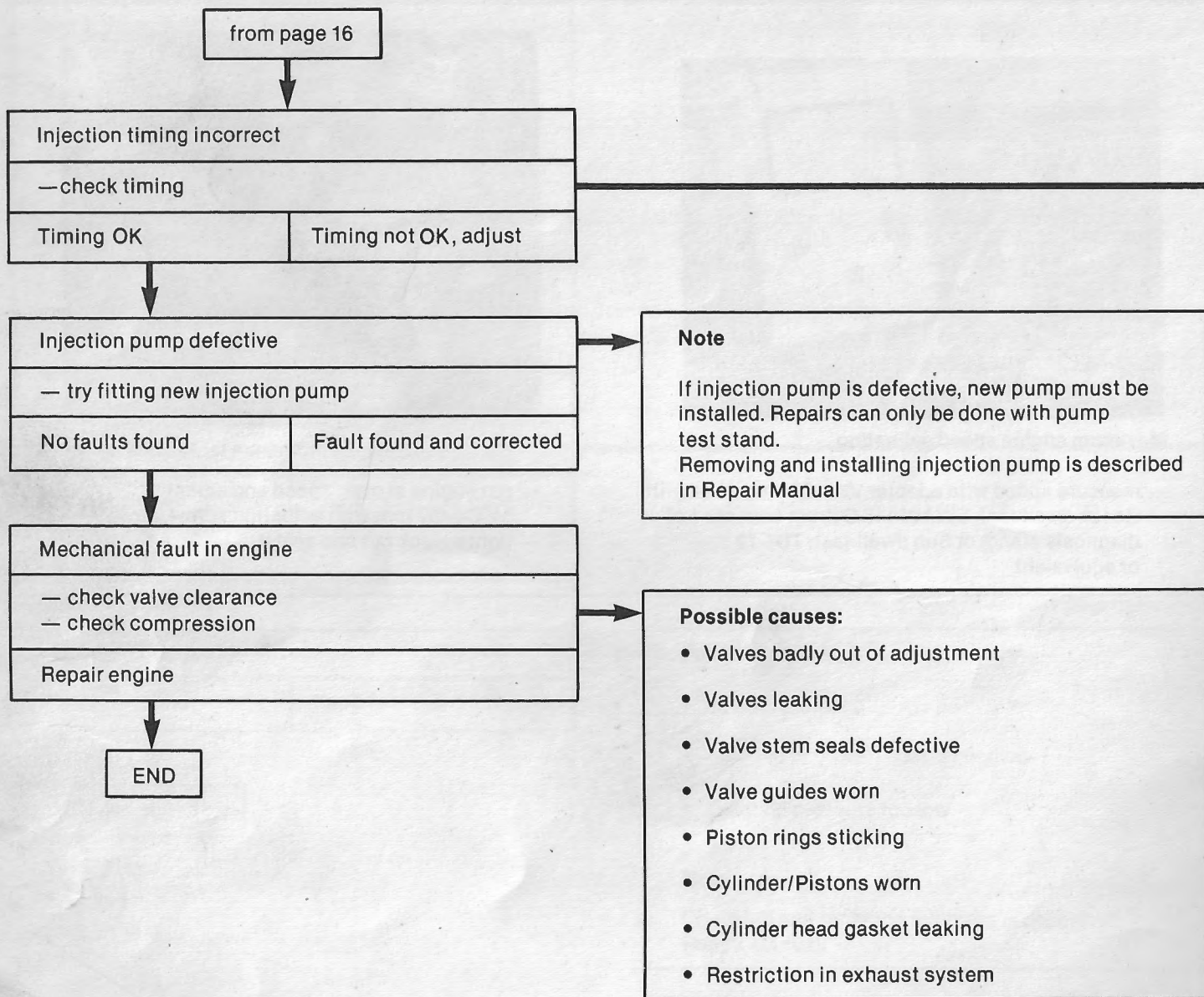
Maximum engine speed, adjusting

- measure speed with adapter VW 1324 together with Bosch dwell-tach EWA 116 C (from console 1 of diagnosis stand) or Sun dwell-tach TDT-12 or equivalent



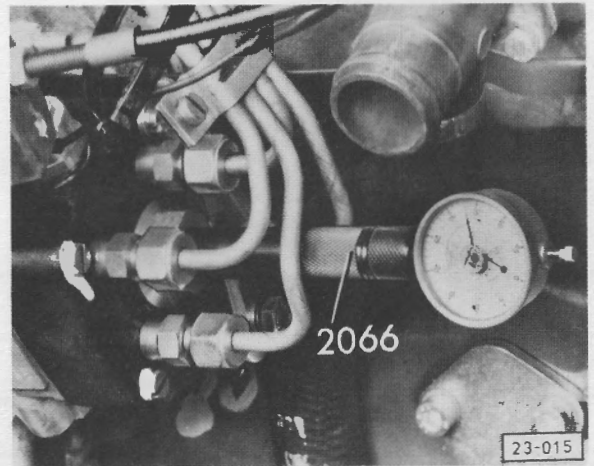
- run engine at max. speed and adjust to 5400-5450 rpm with adjusting screw (arrow)
- tighten lock nut and seal it

Exhaust smoke black, white, or blue

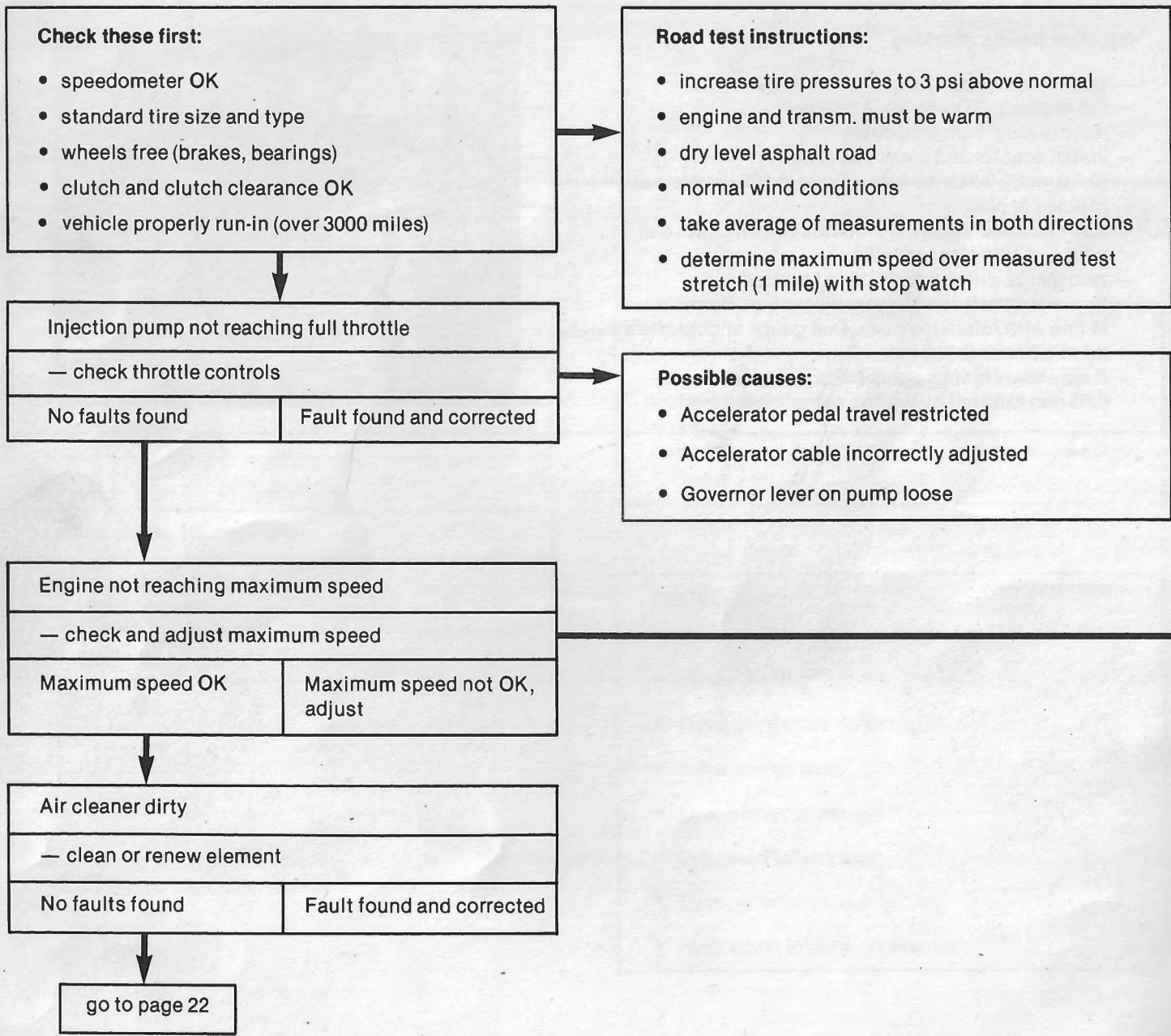


Injection timing, checking

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- if necessary loosen pump bolts and set lift to 0.83 mm (0.32 in.) by turning pump

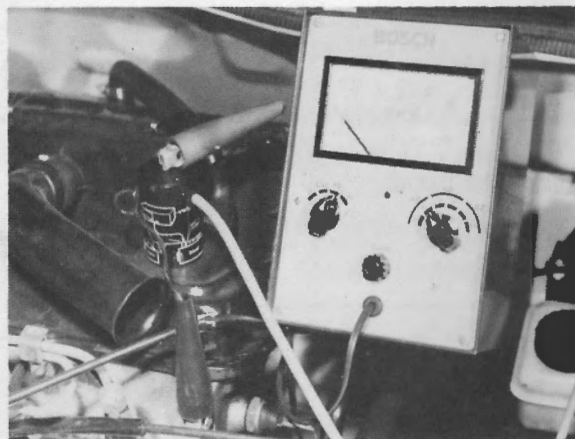
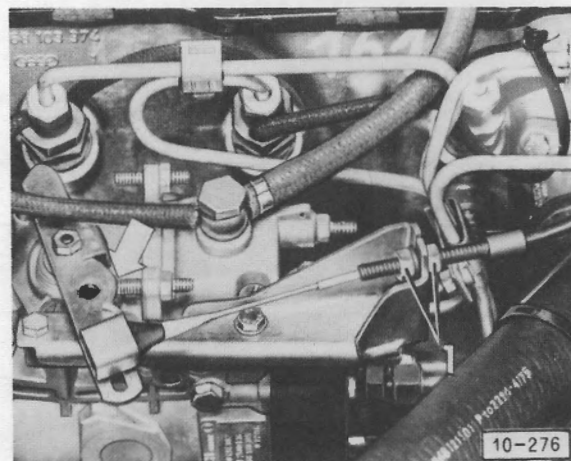


Poor output/performance



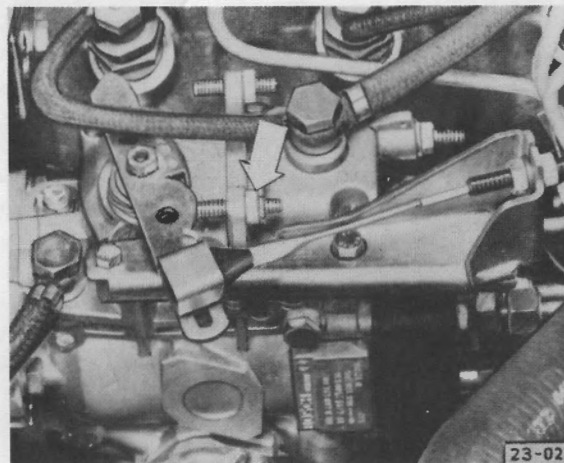
Accelerator cable, adjusting

- with pedal in full throttle position, adjust cable with nuts (1) so that pump lever contacts stop (arrow) free of strain



Maximum engine speed, adjusting

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- run engine at max. speed and adjust to 5400-5450 rpm with adjusting screw (arrow)
- tighten lock nut and seal it

Poor output/performance

from page 20

Fuel filter blocked	
— check fuel filter	
Filter OK	Filter blocked Replace filter

Note

When replacing fuel filter, bleed system

Air in fuel system	
— bleed fuel system	
No faults found	Fault found and corrected

Fuel pipes defective	
— check fuel flow, return and injection lines and tank breather	
No faults found	Fault found and corrected

Possible causes:

- Fuel lines dirty
- Winter only: ice or wax in fuel lines
- Injector lines kinked or squeezed at connections (min. dia. 2 mm)
- Injector lines not connected in correct order
- Tank breather blocked

Injectors defective	
— check injectors	
Injectors OK	Injectors not OK Replace injectors

Possible causes:

- Injectors leaking, dirty
- Nozzle needles sticking or broken
- Injection pressure incorrect
- Heat shields under injectors, defective, leaking

Note

Checking and repairing injectors is described in Repair Manual

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Fuel system, bleeding

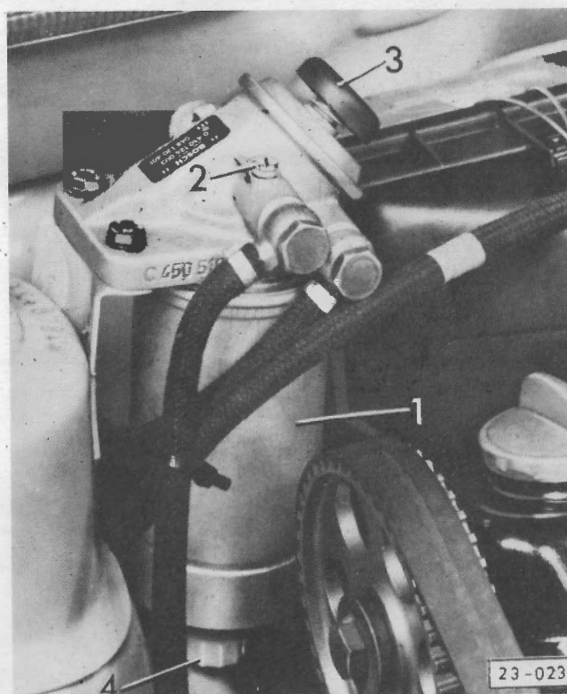
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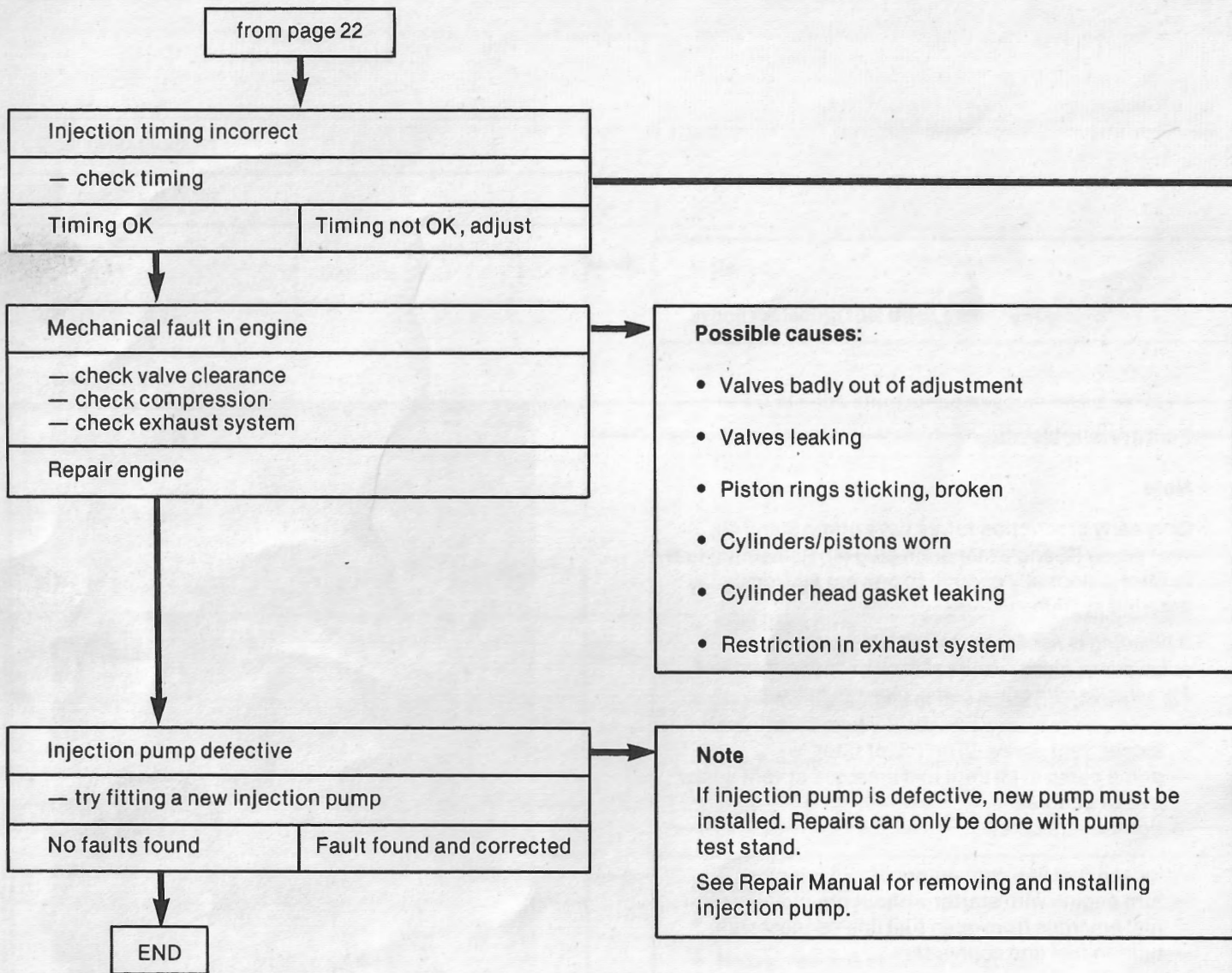
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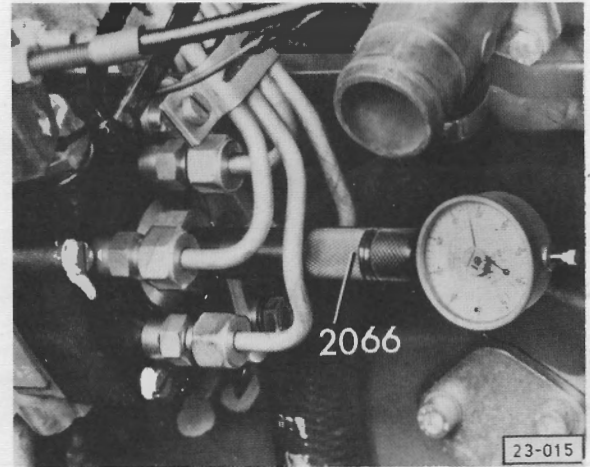


Poor output/performance



Injection timing, checking

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- If necessary loosen pump bolts and set lift to 0.83 mm (0.032 in.) by turning pump



Fuel consumption too high

Check these first:

- Standard size and type of tire
- Wheels free (brakes, bearings)
- Vehicle properly run-in (over 3000 miles)

Air cleaner dirty

— clean or renew element

No faults found	Fault found and corrected
-----------------	---------------------------

Fuel system leaking

— check all feed, return and injector lines, fuel filter and injection pump

No faults found	Fault found and corrected
-----------------	---------------------------

Return pipe blocked

— loosen return line on injection pump and prime pump to see if fuel flows

Fuel flows	Fuel does not flow
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Idle or maximum speeds too high

— check and adjust speeds

Speeds OK	Speeds not OK, adjust
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Note
Establish whether fuel consumption is really too high. If necessary explain to customer the influences that driving style and driving conditions have on consumption figures

Road test procedure:

- if possible customer should be present for test
- plan test route to include mixed driving and traffic conditions (equal parts city and expressway)
- measure consumption with fuel consumption tester or by fuel tank exactly before and after test
- approximate consumption for mixed traffic at temperatures above 0° C (32° F) is: 44 mpg/US

CAUTION

Above figure for comparison with road test result only (under above given traffic/road conditions)

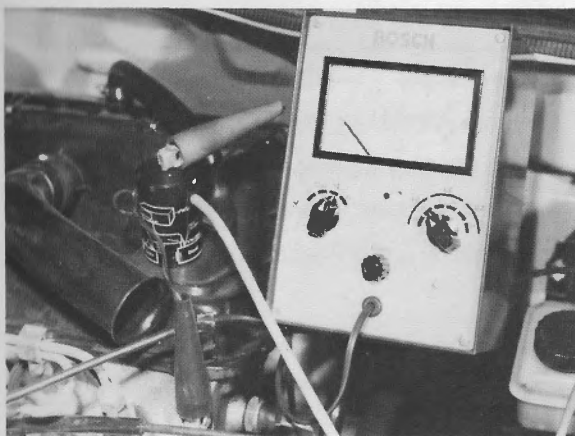
Not to be used as comparison to figure given by customer.

When car is driven short distances and in rush hour conditions fuel consumption can go up.

Note

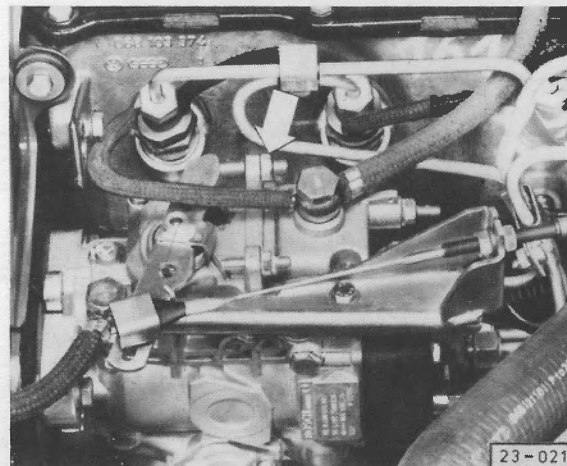
Blow air through return pipe, from injection pump to tank

free blockage



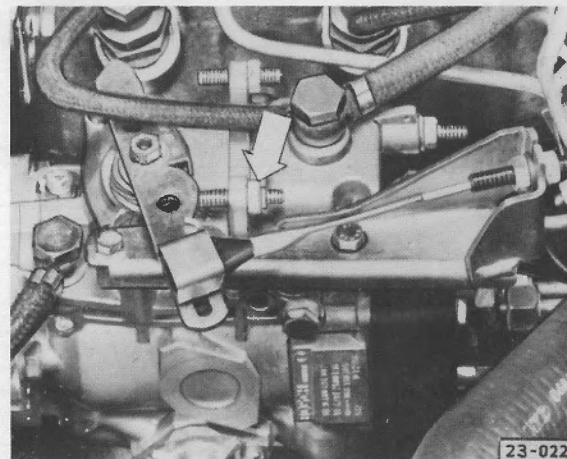
Engine speed, measuring

- measure speed with adapter VW 1324 together with Bosch dwell-tach EWAU 116 C (from console 1 of diagnosis stand) or Sun dwell-tach TDT-12 or equivalent



Idle speed, adjusting

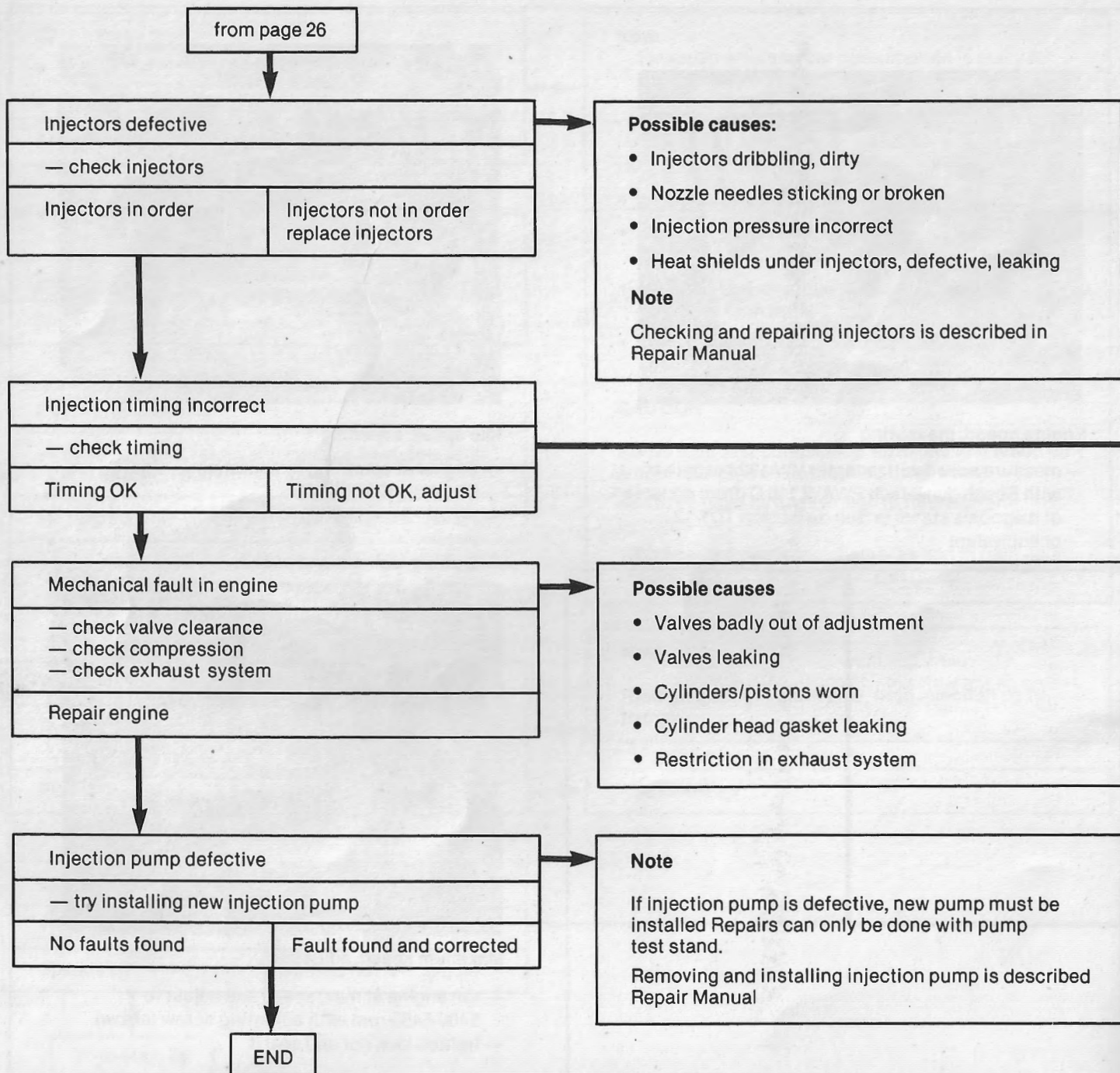
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- tighten lock nut and seal it



Maximum speed, adjusting

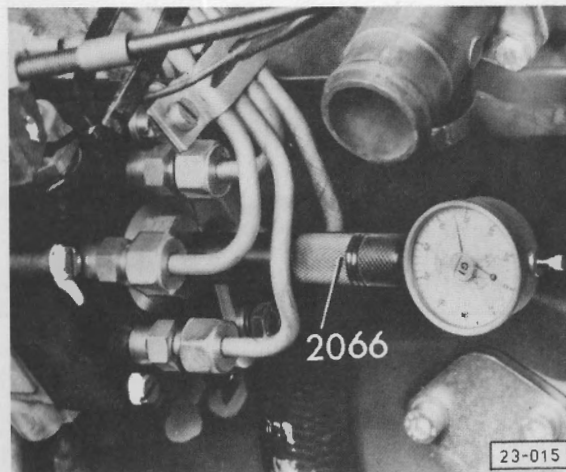
- run engine at max. speed and adjust to 5400-5450 rpm with adjusting screw (arrow)
- tighten lock nut and seal it

Fuel consumption too high



Injection timing, checking

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- if necessary loosen pump bolts and set lift to 0.83 mm (0.032 in.) by turning pump



More Troubleshooting help

		Ordering No.
Engine	MPC fuel injection	
	Type 3 all	
	Type 4 autom. transm. up to Oct. '73	
	Type 4 man. transm.	W 42-00-4950-1
	AFC fuel injection	
	Type 4 autom. transm. from Nov. '73	W 42-00-4946-1
	AFC fuel injection	
	Types 1 and 2 up to model year '75	W 42-00-4952-1
	AFC fuel injection	
	Type 1 model year 1976	W 42-00-5954-1
	AFC fuel injection	
	Type 2 model year 1976	W 42-00-5955-1
	CIS fuel injection	
Dasher, Rabbit, Scirocco		
Audi Fox, Audi 100 LS, Audi 5000	W 42-00-6957-1	
DIESEL Fuel injection Rabbit	W 42-00-7944-1	
Carburetor-equipped Engines		
Air and water cooled	W 42-00-4947-1	
Carburetor-equipped Engines		
Rabbit/Scirocco Model 1976	W 42-00-6956-1	

Transmission	Automatic transmission 003 troubleshooting	
	Types 2, 3, 4 and Dasher	W 42-00-3945-1
	Automatic transmission 010 troubleshooting	
	Rabbit/Scirocco, Dasher, Type 2, Audi Fox,	
Audi 100LS, Audi 5000	W 42-00-5953-1	
Automatic transmission 003 and 010 troubleshooting		
Parts wear comparision	W 42-00-6958-1	

Heater	Heater Type 4 1971/72	W 42-00-2940-1
	Heater Type 4 1973/74	W 42-00-3940-1

Air Conditioner	Air conditioner, factory installed	
	Rabbit/Scirocco	W 42-00-4122-1
	Air conditioner, factory installed	
	Dasher	W 42-03-5146-1
Air conditioner, factory installed		
Audi Fox, Audi 100	W 42-55-5146-1	
