8001

3-4 cylinders

INDUSTRIAL ENGINES

Use and maintenance ■ Uso e manutenzione ■ Emploi et entretien ■ Betriebsanleitung ■ Uso y manutención

IVECO aifo

Thank you for deciding on Iveco Aifo and at the same time, we would like to congratulate you on your choice.

We request that you read the operating and maintenance instructions regarding your new engine.

If you follow these instructions, you can ensure that your engine will operate perfectly and have a long service life.

We would like to remind you that the Iveco Aifo Service Organization is always at your disposal whereever you may be, to provide you with a high degree of efficiency and professional advice.

Warranty

To ensure best possible engine efficiency and take avail of warranty benefits you must follow scrupulously all the instructions provided herein.

Remember that failure to comply with or incorrect performance of recommended service operations will invalidate the warranty.

Spares

The exclusive use of Iveco Original Parts is a prerequisite for excellent maintenance of the engine.

Orders should specify:

- engine technical code and serial number
- part number of the component (see Spare Parts Catalog).

Responsibility

The information contained in this manual is correct at the publication date.

The manufacturer reserves the right to make any modification without notice, at any time, for technical or commercial reasons or to comply with the laws of the different countries and disclaims all responsibility for any errors or omissions.

SAFETY REQUIREMENTS

Basic rules

The following recommendations indicate how to reduce the risk of damages to persons or goods when the system is either in/or out of service.

- The engines must never be used for any purpose other than that agreed by written with the manufacturer. Any other applications must be subject to a special agreement with the manufacturer and must include safety specifications.

- Any form of tampering, modification or the use of non-genuine parts may compromise safety standards.

- The present recommendations have to be applied considering the pertinent regulations of the various Countries.

Maintenance

- When working near the engine or any moving parts, do not wear baggy or loose-fitting clothes, rings or necklaces.

- Always wear protective gloves and goggles :

. when topping up the battery acid;

. when topping up the inhibitor agent or anti-freeze fluid;

; when either changing or tapping up oil (hot motor oil can cause burns, leave it to cool to a temperature of less than 60° C before draining);

. when using compressed air (the maximum air pressure which may be used for cleaning parts must be below 2 atm. or 30 psi, 2 kg/cm^2).

- Always wear a protective steel-cap whenever working in areas where there are overhanging loads or where the machinery is at head height.

- Always wear safety boots and overalls.

- Use protective creams for the hands.

- Immediately replace wet overalls.

- When working on components which may be carrying an electrical charge, always ensure that both the hands and feet are completely dry. When necessary, perform the work using a non-conducting work platform. In any case, it is mandatory that the person performing any of its kind of works is both experienced and qualified.

- No person should attempt to perform any maintenance operation nor adjustments if they are not familiar with the procedure. The instructions must always be closely followed and, in their absense, the supplier or qualified personnel should be contacted.

- Always keep the engine clean by removing all oil, diesel and/or coolant which may be splashed on it.

- Dispose of oil rags in fire proof containers.

- Never leave rags on the engine.

- Use containers of suitable size and safety for the disposal of old engine oil.

- When starting on engine after having carried out repairs, always take steps to stop air intake in case their should be a trouble-shutting during start-up.

Engine cooling system

- Never add coolant to an overheated engine-always wait for normal water degrees.

- Regularly check the coolant level and top up when necessary using only the recommended liquid.

The water used in the engine cooling system must be clean and as free as possible from corrosive chemical and materials.

Artificially softened water must never be used in the cooling system; it is possible to prevent the formation of rust and corrosion by adding rust inhibitor agents to the water as recommended by the manufacturer.

- During the colder months regularly measure the specific gravity of the anti-freeze mixture to ensure the adequate protection of the engine.

Always remove the radiator cap slowly. The cooling system is generally under pressure and, when hot, the coolant may violently blow-out if the pressure is released too rapidly.

- Regularly check the drive belts for correct tension and usage limits.

Lubrication system

Regularly check the level of the sump oil, topping up when necessary.

- Drain and refill the oil at the indicated intervals by the manufacturer using an oil of the recommended characteristics and viscosity as indicated in this publication.

Fuel system

- Try to keep the fuel tank as full as possible, in this way it is possible to reduce the condensation into the tank.

- Periodically drain the fuel tank to remove water and sediments.

- Renew the fuel filter periodically, mainly if there is a drop in the engine's pressure of performance.

- Never smoke nor light during refuelling.

Inlet and exhaust system

- Regularly check the condition of the air filter. The maintenance intervals will vary according to the weather and operating conditions. In particularly dusty locations it will be necessary to perform maintenance to the element more frequently.

- Visually check the exhaust system for the presence of oil, which may indicate oil leak, and immediately repair any malfunctions if detected to avoid the risk of fire.

Ignition system

- Periodically check the battery electrolyte level and top up when necessary using distilled water only.

- Keep the battery clean.

- To avoid risk of not necessary start-up, disconnect the battery earth terminal before working on the engine. Ensure that an eventual engine's automatic ignition system is not activated while work is on duty.

- Always disconnect one of the starter motor terminals when working on an eventual generating set alternator.

- Ensure that all connections are correct and tight and that the insulation on all electrical wires are in a satisfactory condition.

- During recharging, the battery gives off a certain amount of flammable gas, it is therefore mandatory that the area must be well ventilated, that no personnel smoke, and that there are no naked flames near the battery.

- To reduce the likelihood of arcing, it is good practice to always reconnect the battery's positive terminal first and then the negative (generally the earth).

- Periodically check the alternator drive belts for correct tension.

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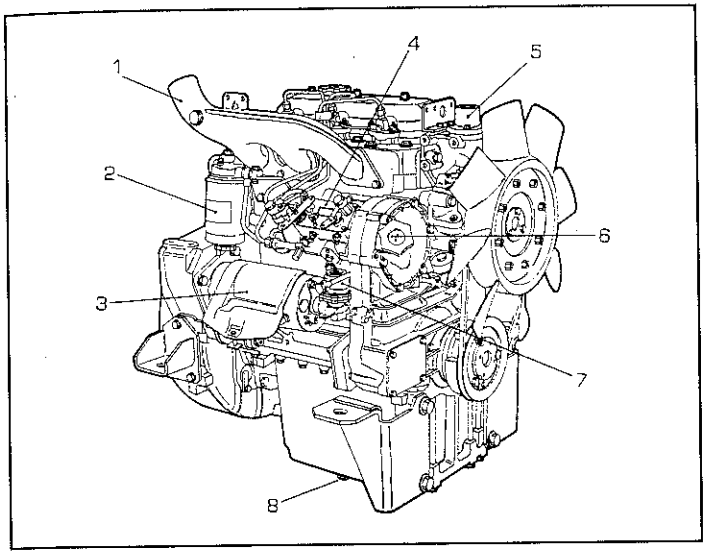
ENGINE IDENTIFICATION DATA

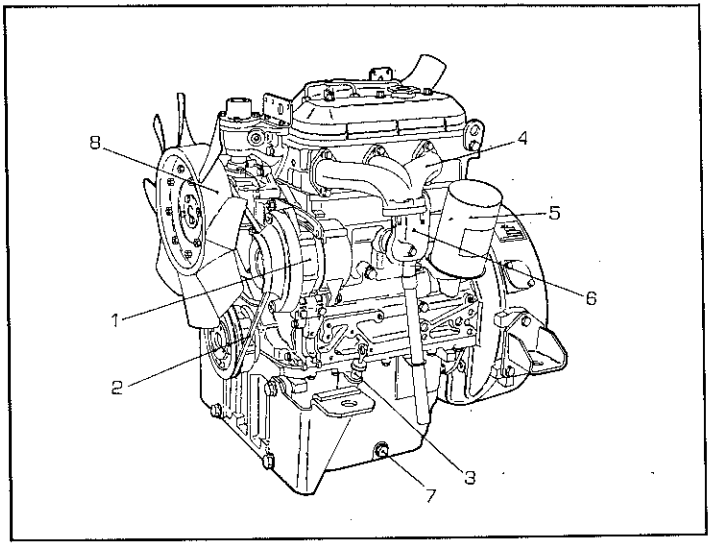
Engine technical code and serial number are punched on a plate located on the flywheel cover.

Note: Always specify engine technical code and serial number when ordering replacement parts and for after sales services.



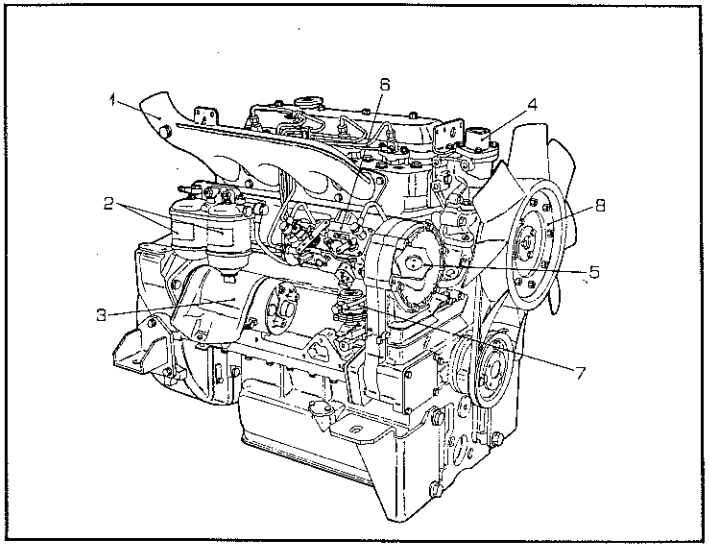
Engine 8031 i 05 - Right hand view

1- Intake manifold - 2. Fuel filters - 3. Starting motor - 4. Injection pump - 5. Thermostat socket - 6. Oil filler cap - 7. Fuel pump - 8. Oil drain plug.



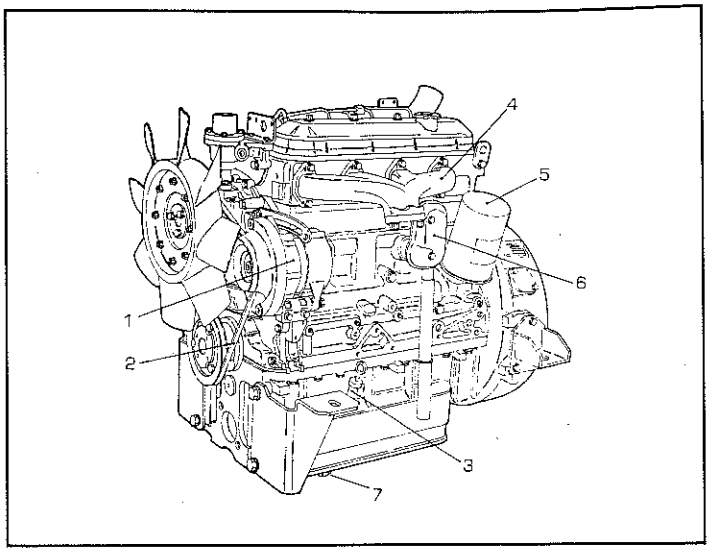
Engine 8031 i 05 - Left hand view

1. Alternator - 2. Alternator-water pump drive belt - 3. Oil dipstick - 4. Exhaust manifold - 5. Oil filter - 6. Engine breather - 7. Oil drain plug - 8. Fan (option).



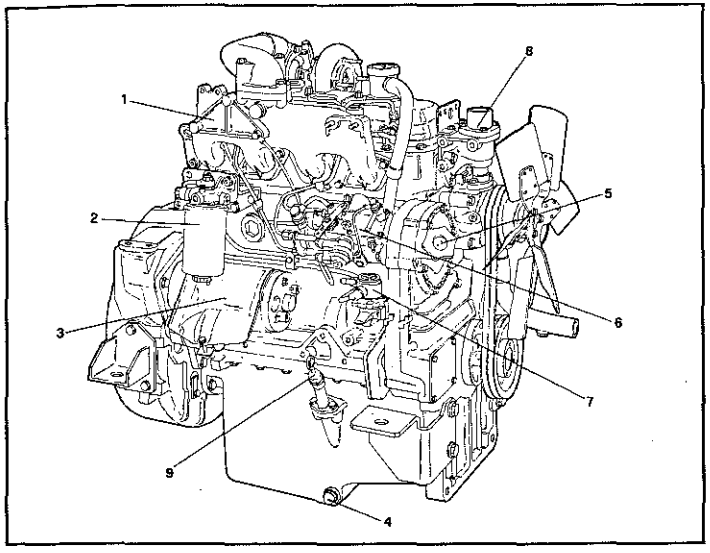
Engine 8041 i 05 - Right - hand view

1. Intake manifold - 2. Fuel filters - 3. Starting motor - 4. Thermostat socket - 5. Oil filler cap - 6. Injection pump - 7. Fuel pump - 8. Fan (option).



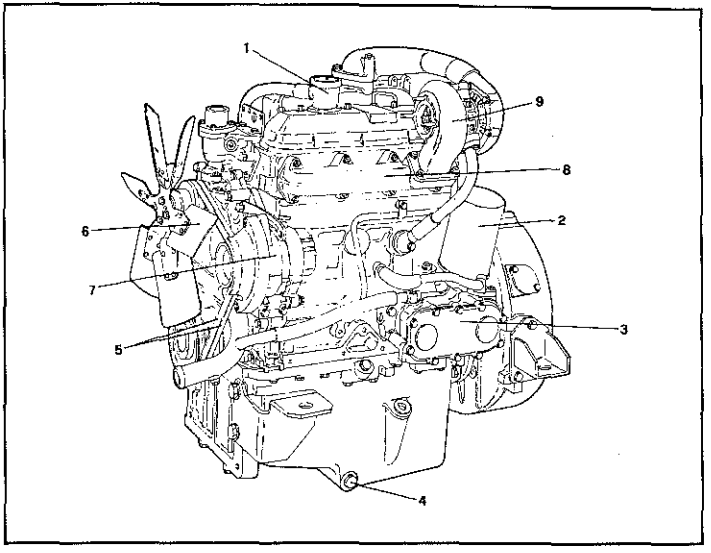
Engine 8041 i 05 - Left-hand view

1. Alternator - 2. Alternator-water pump drive belt - 3. Oil dipstick - 4. Exhaust manifold - 5. Oil filter - 6. Engine breather - 7. Oil drain plug.



Engine 8041 Si 25 - Right hand view

1. Intake manifold - 2. Fuel filter - 3. Starting motor - 4. Oil drain plug - 5. Oil filter cap - 6. Injection pump - 7. Fuel pump - 8. Thermostat socket - 9. Oil dipstick.



Engine 8041 Si 25 - Left-hand view

1. Engine breather - 2. Oil filter - 3. Oil water heat exchanger - 4. Oil drain plug - 5. Alternator-water pump drive belts - 6. Fan - 7. Alternator - 8. Exhaust manifold - 9. Turbocharger.

ENGINE SPECIFICATIONS

Engine type ..... 8031 i 05
4 - stroke Diesel with direct injection
Cylinders, number and arrangement ..... 3, in line
Bore x stroke ..... 104 x 115 mm
Displacement ..... 2,9 l
Compression ratio ..... 17 : 1
Maximum rating(*): ..... 44 kW (60 CV)
At ..... 2500 rpm
Engine rotation:
(see from flywheel) ..... CCW
Dry weight ..... ~ 335 kg
(*) ISO Fuel Stop Power
-Ambient reference conditions:
ISO 3046/1 ; 25° C; 100 kPa ; 30% relative humidity.

TIMING

Overhead valves controlled by pushrods and rockers with camshaft in crankcase.
Gear-driven camshaft.
Valve timing:
- Intake
open: before T.D.C. ..... 3 °
closes: after B.D.C. ..... 23 °
- Exhaust
opens: before B.D.C. ..... 48 ° 30'
closes: after T.D.C. ..... 6 °

Clearance between valve and rockers for timimg checks ..... 0.45 mm
Operating clearance between valves and rockers, cold engine:
- intake and exhaust ..... 0.30 mm

FUEL SYSTEM

Fuel filtration by replaceable cartridge filter.
Fuel supply by double diaphragm pump.
Injection pump type: C.A.V. - DPS with rotating piston distributor, all-speed governor and variator advance incorporated.
Fixed injection pump delivery start advance ..... 0 ° ± 1 °
Fuel injectors setting ..... 230 + 8 kg/cm ^{2}
Firing order 1-2-3

LUBRICATION

Forced-feed lubrication by gear-pump driven by crankshaft.
Pressure relief valve secured to the oil pump.
Total and continuous oil filtering by a replaceable cartridge filter.
Oil cooling with oil-fresh water heat exchanger.
Minimum oil pressure:
- at full throttle ..... 2,5 kg/cm^2
- when idling ..... 0.7 kg/cm^2

COOLING SYSTEM

Forced water circulation controlled by centrifugal pump.
Water temperature controlled by thermostat.
Radiator cooling fan drive by V-belt.

STARTING

By starter motor.

ELECTRICAL SYSTEM

- Voltage 12V
- Self-regulated alternator ..... 14V, 45 A
- Power of starter motor ..... 3 kW
- Battery (optional) ..... 176 Ah

ENGINE SPECIFICATIONS

Engine type ..... 8041 i 05
4 - stroke Diesel with direct injection
Cylinders, number and arrangement ..... 4, in line
Bore x stroke ..... 104 x 115 mm
Displacement ..... 3.9 l
Compression ratio ..... 17 : 1
Maximum rating(*): ..... 59 kW (80 CV)
At ..... 2500 rpm
Engine rotation:
(see from flywheel) ..... CCW
Dry weight ..... ~ 415 kg
(*) ISO Fuel Stop Power
-Ambient reference conditions:
ISO 3046/1 ; 25° C; 100 kPa ; 30% relative humidity

TIMING

Overhead valves controlled by pushrods and rockers with camshaft in crankcase.
Gear-driven camshaft.
Valve timing:
- Intake
open: before T.D.C. ..... 3 °
closes: after B.D.C. ..... 23°
- Exhaust
opens: before B.D.C. ..... 48 ° 30'
closes: after T.D.C. ..... 6°

Clearance between valve and rockers for timimg checks ..... 0.45 mm
Operating clearance between valves and rockers, cold engine:
- intake ..... 0.30 mm

FUEL SYSTEM

Duplex replaceable cartridge fuel filte.
Fuel supply by double diaphragm pump.
Injection pump type : C.A.V. - DPS with rotating piston distributor, all-speed governor and variator advance incorporated.
Fixed injection pump delivery start advance ..... 0 ° ± 1°
Fuel injectors setting ..... 230 +8 kg/cm ^{2}
Firing order 1-3-4-2

LUBRICATION

Forced-feed lubrication by gear-pump driven by crankshaft.
Pressure relief valve secured to the oil pump.
Total and continuous oil filtering by a replaceable cartridge filter.
Minimum oil pressure:
- at full throttle ..... 2.5 kg/cm^2
- when idling ..... 0.7 kg/cm^2

COOLING SYSTEM

Forced water circulation controlled by centrifugal pump.
Water temperature controlled by thermostat.
Radiator cooling fan driven by V-belt.

STARTING

By starter motor.

ELECTRICAL SYSTEM

- Voltage 12V
- Self-regulated alternator ..... 14V, 45 A
- Starting motor power ..... 3 kW
- Battery (optional) ..... 176 Ah

ENGINE SPECIFICATIONS

Engine type ..... 8041 Si 25
4 - stroke Diesel with direct injection
Cylinders, number and arrangement ..... 4, in line
Bore x stroke ..... 104 x 115 mm
Displacement ..... 3.9 l
Compression ratio ..... 16.5 : 1
Maximum rating(*): ..... 85 kW (115 CV)
At ..... 2500 rpm
Engine rotation:
(see from flywheel) ..... CCW
Dry weight ..... ~ 400 kg
(*) ISO Fuel Stop Power
-Ambient reference conditions:
ISO 3046/1 ; 25° C; 100 kPa ; 30% relative humidity.

TIMING

Overhead valves controlled by pushrods and rockers with camshaft in crankcase.
Gear-driven camshaft.
Valve timing:
- Intake
open: before T.D.C. ..... 3 °
closes: after B.D.C. ..... 23°
- Exhaust
opens: before B.D.C. ..... 48 ° 30'
closes: after T.D.C. ..... 6°

Clearance between valve and rockers for timimg checks ..... 0.45 mm
Operating clearance between valves and rockers, cold engine:
- intake and exhaust ..... 0.30 mm

FUEL SYSTEM

Fuel filtration by replaceable cartridge filter.
Fuel supply by double diaphragm pump.
Injection pump type : C.A.V. - DPS with rotating piston distributor, all-speed governor and variator advance incorporated.
Boost control (LDA) on injection pump.
Fixed injection pump delivery start advance ..... 0 ° ± 1°
Fuel injectors setting ..... 230 +8 kg/cm ^{2}
Firing order 1-3-4-2

TURBOCHARGER

The engine is supercharged by turbocharger driven by the exhaust gases.
The turbocharger is lubricated with the engine oil under pressure.

LUBRICATION

Forced-feed lubrication by gear-pump driven by crankshaft.
Pressure relief valve secured to the oil pump.
Total and continuous oil filtering by a replaceable cartridge filter.
Oil cooling with oil-water heat exchanger.
Minimum oil pressure:
- at full throttle ..... 2.5 kg/cm^2
- when idling ..... 0.7 kg/cm^2

COOLING SYSTEM

Forced water circulation controlled by centrifugal pump.
Water temperature controlled by thermostat.
Radiator cooling fan driven by V-belt.

STARTING

By starter motor.

ELECTRICAL SYSTEM

- Voltage 12V
- Self-regulated alternator ..... 14V, 65 A
- Starting motor power ..... 3 kW
- Battery (optional) ..... 143 Ah

FILLUP DATA

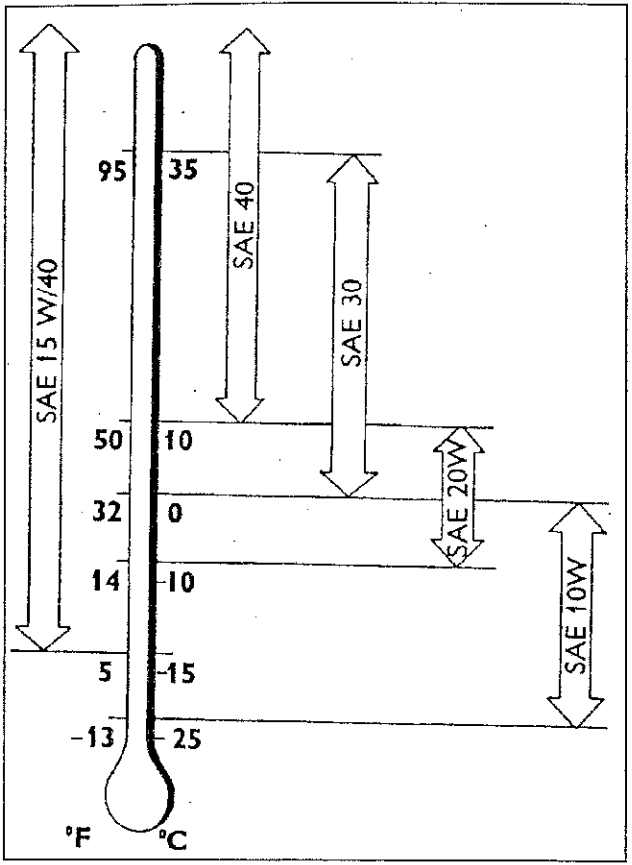
Item	Quantity l	Quantity kg	Product
Water circuit 8031 i 05	~ 5	-	Water (1)
- 8041 i 05-Si 25	~ 6,7	-	
Engine sump and filters (total capacity) 8031 i 05	7,7	7	Oil (3)
- 8041 i 05	11,5	10,5	
- 8041 Si25	10.5	9.5	
Engine sump only:			
- Min. level 8031 i 05	4,4	4	
- 8041 i 05	7,2	6,5	
- 8041 Si25	6.4	5.8	
-			
Max. level (2) 8031 i 05	6,6	6	
- 8041 i 05	10,5	9,5	
- 8041 Si25	9	8.2	
Fuel tank	-	-	Automotive Diesel oil (4)

1) Use water with 30% of FIAT PARAFLU 11 anti-freeze; use the same amount of anti-freeze even during the summer months to prevent corrosion.
As an option, products having similar-characteristics can be used, provided they comply with international standards SAE J 1034

2) This quantity relates to periodical oil changes.

3) Recommended oil: Fiat Oil Urania Turbo LD (MIL-L-2104E) or CCMCD5.
Qualitity of oil requires in relation to outdoor temperature, see table.

4) For filling fuel tank use funnel with a very fine metal strainer to prevent filter clogging caused by impurities in the fuel.



USE OF ENGINE OIL

URANIA

For efficient engine operation SAE viscosity should be as indicated in relation to outdoor temperature.

RUNNING-IN (50 hours)

- After starting, slowly warm up the engine when running, without reaching full throttle.
- Do not run engine for a long period at full throttle.
- Check oil level frequently.

on

The following operation are needed after running-in:

- Engine oil change
- Cartridge oil filter replacements

BEFORE STARTING

When the engine has been out of action for long periods:

- check the level of the lubricants
- bleed the air from the fuel circuit.

Only for supercharged engines:

- keeping the accelerator lever at minimum turn engine by means of starter motor for approx. 20-30 secs. This is necessary to ensure instant lubrication of the internal gear of the turbocharger on engine starting.

Every day:

- check the level of the fuel, engine oil and fresh cooling water
- check to ensure that the air filter on the intake pipe is not clogged.

PRECAUTION IN THE USE OF TURBOCHARGED ENGINES

The turbocharger is an integral part of the engine.

Very often faults are attribuited to the turbocharger when the real trouble lies with the engine or with one of the fittings.

To avoid pointless downtimes and to extend turbocharger life and efficiency, some basically important instructions are given below.

1- Possible causes of turbocharger trouble are essentially three:

a) Lack of lubricant: causes bearing failure with consequent seizure of rotary components.

b) introduction of foreign matter: poor servicing of air cleaner will involve the introduction of solid particles which will damage the compressor-impeller blades: fragments would then be carried to the cylinders.

c) Lubricant contamination: this causes scoring of journals and bearings, clogs oil passages, wears the seals, with consequent leakages and seizures.

Important: It is therefore recommended that you take utmost care in cleaning the air cleaner and air ductings: also, renew engine oil supply and filters at the specified servicing intervals.

2- Turbocharger construction simplicity is only apparent: in fact many of its parts are machined to 1/1000mm tolerances. It is therefore recommended that you entrust any servicing to skilled personnel having availability of special equipment provided by the service network.

3- Preventive maintenance will extend the life and efficiency of the turbocherges. Should you notice loss of lubricant, vibrations or abnormal noises, stop engine immediately. Timely servicing will avoid costly and unexpected repairs.

4- Turbocharged engines impose simple though essential precautions during engine starts and shutdowns.

ATTENTION ! For the best lubrication of the turbocharger we advise to let the engine run without load for at least 30 seconds when starting and at least 3 minutes when stopping (longer periods could be necessary according to the service).

STARTING UP

- Push accelerator lever to travel end.
- Insert lock switch key and push control lever to the stop.
- Do not release lever until engine has a sufficient impulse. Once engine is started properly, act on the accelerator without running immediately at high speed.

STOPPING THE ENGINE

Position the accelerator lever to zero, and after allowing the engine to idle at low speed for a few minutes, bring back the starting switch key to zero.

PRECAUTIONS FOR PROPER ENGINE FUNCTIONING

Run engine from idle to full throttle and vice versa gradually to ensure satisfactory combustion and proper functioning of all components.

Avoid running the engine at full throttle for long periods of time.

When the engine is running make sure that:

- Fresh cooling water temperature are maintained normal, i.e. green zone on temperature gauge.

If temperature is excessive, check:

a) vee-belt tension on water pump-alternator

b) proper functioning of thermostat,

c) heat exchanger, cleaning condition,

- Engine oil pressure when hot and at normal engine speed must be in green zone of pressure gauge.

COLD CLIMATE PRECAUTIONS

When temperatures approximate 0° C, make sure water is mixed with proper amount of FIAT Paraflu 11 which prevents oxidation, corrosion, foaming, fouling and freezing down to - 20 ° C with Paraflu 11 admixed to 30%.

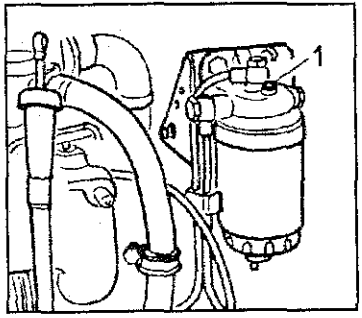
Do not remove the fluid in the other seasons but renew it every 2 years.

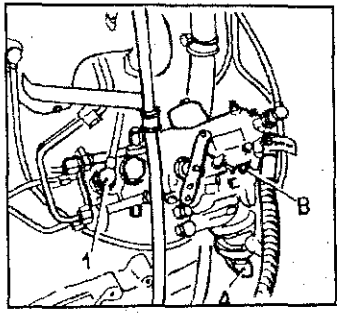
BLEEDING OF THE FUEL SYSTEM (C.A.V. DPS INJECTION PUMP)

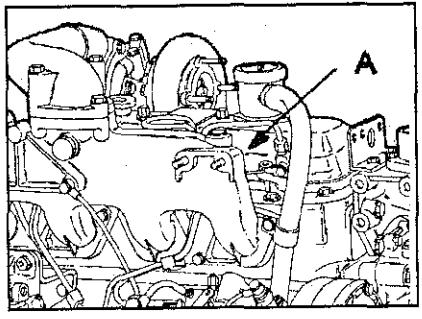
Loosen the bleed plugs 1 (low pressure circuit) of the fuel filter and of the injection pump, then operate repeatedly the lever A of the fuel pump: when the fuel flows without air bubbles, tighten plugs 1.

Then bleed the injection pump, loosening the plug B (high pressure circuit) and turn the engine by means of the starting motor and, in the same time, actuate on the accelerator lever, so that the possible fuel pump air comes out.

When the fuel flows without air bubbles, tighten plug B.







BLEEDING OF THE WATER COOLING SYSTEM (AT EACH NEW REFILLING)

Loosen completely the bleed plug A of the cooling circuit.

Fill slowly the cooling liquid through the filler cap of the radiator, to the top.

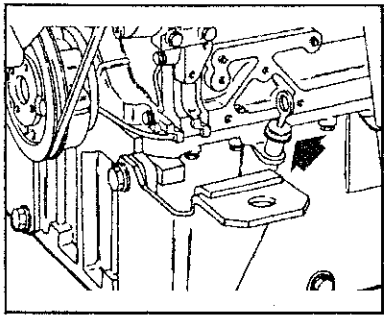
Verify on the cylinder head, where the bleed plug A is located, that the water flows without air bubbles, then tighten the plug. Fill completely the cooling circuit through the fillercap of the radiator.

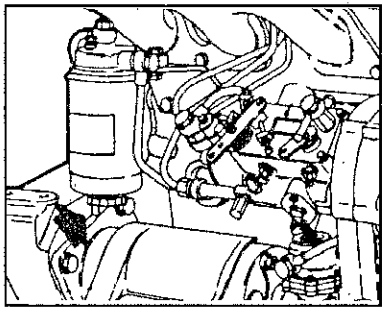
ROUTINE MAINTENANCE

Operations	Daily	Every 100 h	Every 200 h	Every 400 h	Every 800 h	Every 1000h	Every year
Checking sump oil level	●						
Checking radiator water level	●						
Draining the condensate from the fuel filter	●						
Checking battery electrolyte level and charge		●					
Changing engine sump oil			●				Y
Checking drive belt tension and conditions			●				Y
Changing oil filter cartridges				●			Y
Changing fuel filter cartridges			M				Y
Cleaning fuel pump filter				●			Y
Checking valve clearance			first check		●		
Checking fuel injector setting					●		Y

M = Maximum operating time with high quality fuel.

Y = Operations to be accomplished at least every year regardless of operating hours.





CHECKING SUMP OIL LEVEL

Check and top up if necessary the sump oil level.

This level must always be between the dipstick marks Min and Max.

CHECKING RADIATOR WATER LEVEL

With the engine cold check the water level and top up if required.

DRAINING THE CONDENSATE FROM THE FUEL FILTER

Drain the condensate from the fuel filter. Screw out the nut located beneath the filter and tighten it again as soon as fuel without water emerges.

CHECKING BATTERY ELECTROLYTE LEVEL AND CHARGE

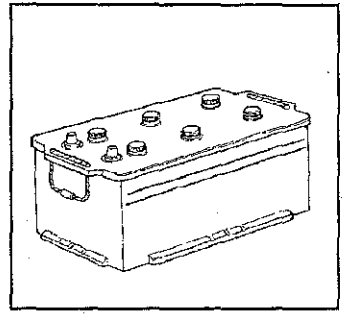
With the batteries rested and cold remove the plugs and make sure that the electrolyte level lies between the Min and Max limites.

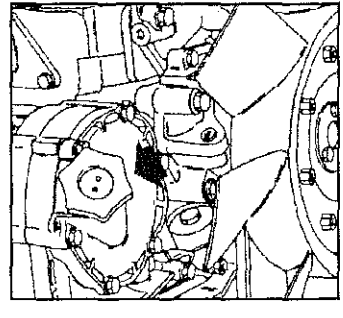
Top up with distilled water if necessary.

Check more often in summer.

If the engine is to remain at standstill check the level once every month and recharge the batteries if required.

Check that the terminals and terminal clamps are clean, tight, and protected with vaseline oil. If "no-maintenance" batteries are used the level of the electrolyte need not be checked so often.

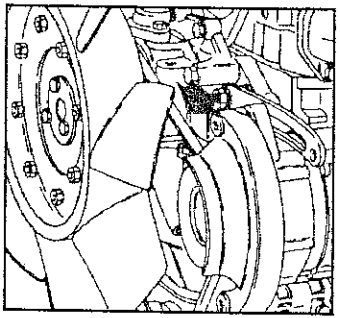


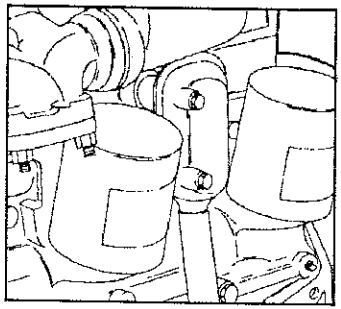


CHANGING ENGINE OIL SUMP

Drain the oil with the engine still warm through the plug on the sump or operate the manual pump (if provided): fill with fresh oil as "Refill" table.

With a new engine replace the oil first time after the first 50 hours of running-in.





CHECKING DRIVE BELT TENSION AND CONDITIONS

Check belt tension: give at arrow must be 1 to 1.5.

To increase tension of the water pump driving belts:

- Unloose alternator check nuts A and B,
- Move alternator outward and retighten nuts.

CHANGING OIL FILTER CARTRIDGES

Do not exceed the specified limit. With plugged filter all the oil in the circuit is no longer filtered.

On a new or overhauled engine replace the cartridge after the running-in period.

N.B.: Make sure that the new cartridges are of the same type as the old ones.

CHANGING FUEL FILTER CARTRIDGES

Changed the cartridges and bleed the air.

Note: Always use a filtering cartridge of the same make as the one it replaces.

CLEANING FUEL PUMP FILTER

Unscrew cover bolts (indicated by the arrow), remove filter element and clean it carefully in Diesel oil.

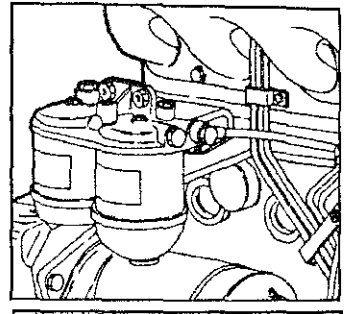
CHECKING VALVE CLEARANCE

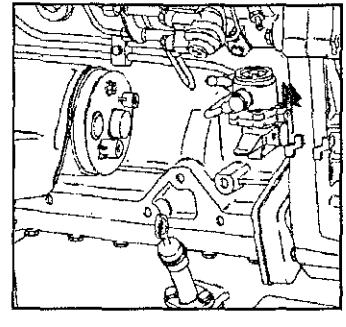
The operating clearance between valves and rockers should be 0.30 mm for the inlet and 0.30 mm for the exhaust.

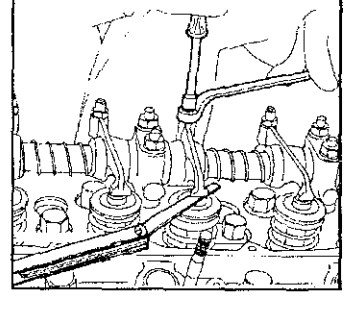
Adjust the clearance when the engine is cold by means of the screw with stop nut located on the head of each rockers.

New engines should be checked after the first 200 hrs of operation.

Apart from the prescribed periods, the clearance only requires checking if the rocker cover is unusually noisy.







CHECKING FUEL INJECTOR SETTING

Remove fuel injectors from cylinder heads and have them cleaned.
This job must be carried only by a trained mechanic using special tools.

On and efficient fuel injector:

- each nozzle hole must produce a jet;
- each jet must be regular and efficient;
- each nozzle hole must produce the specified spray pattern;
- fuel injector must neither leak or dribble;
- fuel injector needle must lift only at a pressure of 230 + 8 kg/cm ^{2}.

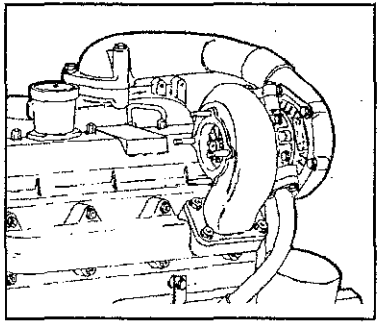
When reassembling fuel injectors torque the nuts of the fixing brackets with a torque wrench to 2.3 kgm.

IT IS IMPORTANT that fuel injector maintenance is accomplished by a trained mechanic using the proper tools so as not to detriment proper functioning.

SPECIAL MAINTENANCE

Introduction: The operations indicated in special maintenance have no given frequency since they are necessary whenever the engine is not functioning properly and must only be carried out by skilled engine maintenance mechanics.

Operations — Page



CHECKING AND CLEANING TURBOCHARGER

When the turbocharger is not working properly clean it as follows:

- remove turbocharger from engine;

- disassemble aluminium body enclosing main rotor;

- immerse complete assy in petrol (gasoline) until all dirt is dissolved;

- assist through cleaning by using a plastic brush or scraper;

- wipe and dry in air making sure that the oil ducts are perfectly clean;

It is better not to use steam which might damage the bearings and the shaft. Make sure that the intake filter is perfectly clean.

Note: Every time turbocharger is disassembled and before starting it, make sure to prime it with engine oil to prevent damage due to dry running.

VALVE REGRINDING AND CYLINDER HEAD BOLT TORQUE REQUIREMENTS

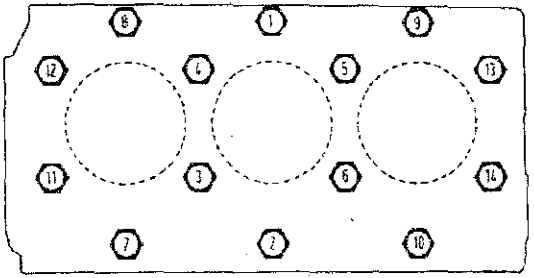
Should the compression of a cylinder be lacking dissassemble cylinder head from the cylinder block and dress the valve seats and valves.

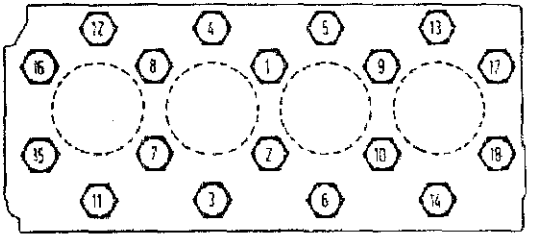
When bolting the cylinder head, clean throughly the contact faces and fit the head gasket as described:

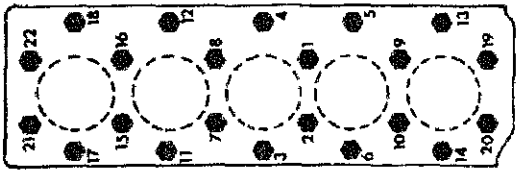
- position the adhesive-faced gasket to the block and make sure the ALTO (high) writing on it is brought to contact the cylinder head.

Note: Torquing down of the cylinder head bolts should be performed in fours steps (a 15 sec. step-to-step interval is needed). Strictly comply with the operation sequence indicated in the figures and on table here below.

Step	1	2	3	4
	Pre-torque	Pre-torque check	Torque angle	
All models	70 Nm (7.1 kgm)	70 Nm (7.1 kgm)	90 °	90 °







TORQUE REQUIREMENTS FOR MAIN ENGINE COMPONENTS

Big end cap ..... 4.1 kgm + 60°
Journal cap ..... 8.2 kgm + 90°
Nut securing pulley hub/vibration damper ..... 30 Kgm
Bolt securing flywheel ..... 4.1 kgm + 60 °

CRANKSHAFT DAMPER (8041 Si 25)

We point out that the torsional damper (viscous type or made of rubber) fitted on the crankshaft, when it is weared, can cause the breaking of the crankshaft:

The wear level of this part depends on the power, R.P.M. and ambient conditions.

The damper must be replaced at each general overhauling of the engine.

Moreover we suggest to replace the damper, meanly, after the following periods:

- 8041 Si 25 ..... 15.000 hours

LONG INACTIVITY INSTRUCTIONS

When the engine is to be taken out of service for an over 1 month period, it is necessary to protect if from the corrosions and damages by proceeding as follows:

1. Drain the oil from the engine sump and refill it with purging oil (i.e. oil FIAT L 20).

2. Let the engine run for 15 min. at 500 - 800 rpm; stop the engine and drain the oil.

3. Drain the oil from the in-line injection pump.

4. Fill the engine sump with oil FIAT Prot. 30/M up to the level "Min" marked on the oil dipstick.
If the oil Prot. 30/M is not available, use an oil according to the specifications MIL-2160B-type 2.

5. Fill the in-line injection pump with oil Prot. 30/M.

6. After emptying the fuel filters, disconnect the pipe of the injection system feeding, upstream the fuel pump, and link it to a tank containing oil CFB (ISO 4113).

7. Let the engine run for 15 min. at 500 - 800 RPM.; then, using a syringe, nebulize slowly (1 min. about) into the air induction manifold the following quantity of oil Prot. 30/M.:
- 60 g. for 3 - 4 cylinders engines
- 120 g. for 6 cylinders engines
- 200 g. for 8 cylinders engines (equally divided in each bank).

8. Drain, with hot engine, the oil Prot. 30/M from the engine sump; the oil can be used again twice or 3 times.
Slacken the trapezoidal belts.

9. Disconnect the pipe of the injection system feeding from the oil CFB tank and link it to the fuel tank.

10. Seal, using adhesive tape, on the engine and exhaust manifold, all ports of access, induction and breather.

11. Put on the engine a visible card, specifying "ENGINE WITHOUT OIL".

12. Disconnect the batteries and stock them in a dry site, keeping them charged always;

13. Drain the cooling water if it is not mixed with anti-freeze liquid/corrosion inhibitor.
IMPORTANT: THIS TREATMENT MUST BE REPEATED EVERY 6 MONTHS

RESTORATION OF THE RUNNING CONDITIONS

To restore the normal running conditions of the engine, carry Eout the following operations:

1. Drain the oil Prot. 30/M from the injection pump.
2. Fill the engine sump and the injection pump with the normal utilized oil, at the required level.
3. Stretch the trapezoidal belts.
4. Take away the seal from the parts of access, induction and breather.
5. Remove the card "ENGINE WITHOUT OIL".

SUPPLEMENT FOR GENSET ENGINES

MODELS

- 8031I05 A550
- 8041I05 A500

TABLE OF CONTENTS

ENGINE SPECIFICATIONS

Engine type 8031i05 A500
4 - stroke Diesel with direct injection
Cylinders, number and arrangement ..... 3, in line
Bore x stroke ..... 104 x 115 mm
Displacement ..... 2.9 l
Net power at flywheel (*) :
- Max stand-by power (Fuel Stop Power) - ISO 3046 :
1500 rpm ..... 32 kW (43 CV)
1800 rpm ..... 36 kW (49 CV)
- Prime power (P.R.P.) Limited power (L.T.P.) - ISO 8528 :
1500 rpm ..... 29 kW (39 CV)
1800 rpm ..... 33 kW (45 CV)
Engine rotation :
(see from flywheel) ..... CCW
Dry weight ..... 385 kg

ENGINE SPECIFICATIONS

Engine type 8041i05 A500
4 - stroke Diesel with direct injection
Cylinders, number and arrangement ..... 4, in line
Bore x stroke ..... 104 x 115 mm
Displacement ..... 3.9 l
Net power at flywheel (*) :
- Max stand-by power (Fuel Stop Power) - ISO 3046 :
1500 rpm ..... 41 kW (56 CV)
1800 rpm ..... 48 kW (65 CV)
- Prime power (P.R.P.) Limited power (L.T.P.) - ISO 8528 :
1500 rpm ..... 36 kW (49 CV)
1800 rpm ..... 43 kW (58 CV)
Engine rotation :
(see from flywheel) ..... CCW
Dry weight ..... 432 kg

AIR SUPPLY

Air cleaning by means of a dry type air filter with clogging indicator.

GOVERNING

The engines are equipped with a mechanical governing.

COOLING SYSTEM

Forced water circulation controlled by centrifugal pump.
Water temperature controlled by thermostat.
Radiator cooling fan on engine axis.

LUBRICATION

Minimum oil pressure : 1.5 bar (standard ambient temperature 20 °/25°C):

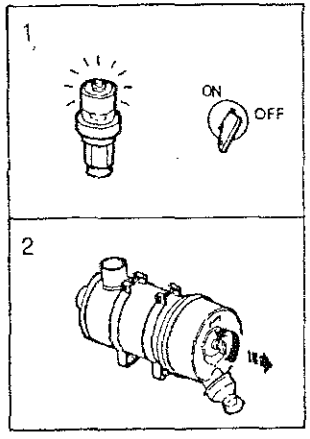
MAINTENANCE OF THE DRY AIR FILTER

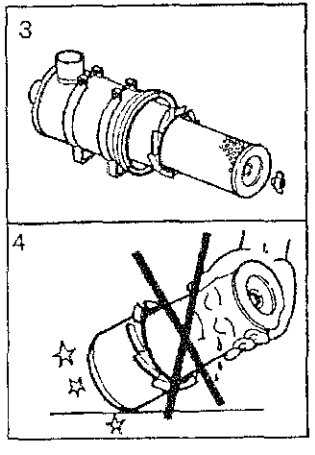
To carry out when the air clogging indicator on the filter is fixed on the red area (or the alarm light is on).

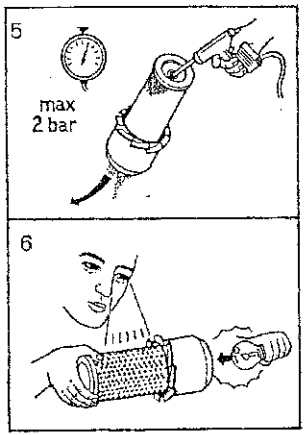
This operation must be carried out at least once a year; the frequency of this operation will be, in any case, variable in function of the ambient in which the engine works.

EXTERNAL CARTRIDGE FILTER MAINTENANCE

1. Stop the engine;
2. Remove the filter cover;
3. Unscrew the external cartridge and extract it taking care that no dust enters the pipe;
4. Never hit it with tools;
5. Clean it with dry compressed air from the inside to the outside (pressure must not be more than 2 bar, in order to avoid damage to the cartridge);
6. Check the cartridge condition before replacing it by illuminating the inside with a lamp : if the cartridge shows signs of tears or holes, it should be replaced;







7. Verify that the gasket on the cartridge base is in good condition;
8. Reassemble all the parts correctly;
9. Check that the clamps connecting the pipe to the filter are securely locked.

SAFETY-CARTRIDGE (Optional)

This should not be cleaned but replaced at each third replacement of the external cartridge.

Warning: Never use petrol, solvents, nor other inflammable liquids.

AIR FILTER CLOGGING INDICATOR

After servicing the cartridge, do not forget to reset the mechanical clogging indicator by pressing the button placed at the top of the indicator.

The electric indicator does not need this operation.