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1.INTRODUCTION

Introduction

Thank you for purchasing an ANTOR Diesel engine. This manual covers operation and maintenance of the ANTOR 3LD510 Diesel engines. All information in this publication is on the latest product information available at the time of approval for printing. ANADOLU MOTOR ÜRETİM VE PAZARLAMA A.Ş. has the right to make changes at any time without notice and without incurring any obligation.

No part of this publication may be reproduced without written permission of ANADOLU MOTOR ÜRETİM VE PAZARLAMA A.Ş.

This manual should be a permanent part of the product and should remain with it if it is resold.

ANTOR engines are designed to give safe and dependable service if operated according to the instructions. Read and understand the Use and Maintenance Manual thoroughly. Failure to do so could result in personal injury or equipment damage.

The producer can not be held responsible for damages to the user ,to third persons or equipment resulting from uses the engine is not intended for or incompatible with the performance characteristics.

Do not try to make any modifications on the engine or change the settings. This may be hazardous for the user and third persons, may affect negatively the performance and life of the engine and will make the warranty terms void.

The engine's maintenance is customer's responsibility. The troubles or damages resulting from neglect or improper maintenance are out of guarantee. The maintenance instructions mentioned in this manual must be strictly followed.

Do not take off any off the safety stickers, protections, covers or any safety elements. These are designed for your safety.

If a problem should arise, or if you have any questions about the product, consult an authorized Anadolu Motor Dealer or After Sales Service.

Useful life of this product is 10 years.

Batteries of electric start engines are sold separately.

Throughout this manual, you will see safety messages preceeded by the following words and symbols. Here's what they mean:



DANGER ! : Indicates serious injury or death **will** result if instructions are followed.



WARNING ! : Indicates a strong possibility of serious personal injury or death if instructions are not followed.



CAUTION ! : Indicates that personal injury,equipment or property damage may result if instructions are not followed.

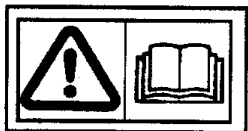
NOTE : Gives helpful information for the safe and efficient use of the engine.

2. SAFETY RULES

Safety rules

For your safety , the safety of others and to prevent damage to your machine and equipment , pay special attention to these precautions.

User's responsibility



ANTOR engines are designed to give safe and dependable service if operated according to the instructions. Read and understand the Use and Maintenance Manual thoroughly. Failure to do so could result in personal injury or equipment damage.

To ensure safe operation ;

- Read and understand the Use and Maintenance Manual carefully before starting to use the engine. Always make a pre-operation inspection before starting the engine.
- Know how to stop the motor engine in case of emergency and understand operation of all the controls. Do not permit anyone to operate the equipment without proper instructions and experience.
- Keep children and animals away from the engine and equipment while in operation.
- Check the engine fuel and oil levels before starting. Add fuel and/or engine oil to the correct levels as recommended.
- Fuel is harmful even lethal if swallowed. Keep the fuel tank away from the reach of children.
- Re-fuel in a well ventilated area with engine stopped. Do not smoke or allow flame or sparks in the area where the engine is refueled or fuel stored. After refueling, make sure that fuel tank cap is securely closed.
- Do not overfill the fuel tank, dilatation may cause the fuel to overflow. Be careful not to spill fuel when filling the tank. Spilled fuel or fuel vapor may ignite. If any fuel is spilled, make sure the area is dry before starting the engine.

- Do not place any objects on the engine or cover it with flammable material. This may cause fire may break out.
- Always wear appropriate clothes when starting the engine. Long sleeves, ties or stoles may be wrapped around rotating parts and cause serious injuries.
- Allow sufficient air to enter the area where the engine is running. Run the engine/equipment at least 1 meter away from buildings and other objects.
- Place the engine/equipment on a solid ground.Do not allow the engine to run on slopes exceeding 25° . Excessive inclination may cause the fuel to spill out or damage the engine because of insufficient lubrication.
- The engine and exhaust system become very hot during operation and remain hot for a while after stopping. Contact with hot engine components can cause burns and may ignite some materials. Avoid touching a hot engine or exhaust system.

Carbon monoxide poisoning hazard

- Exhaust gas contains poisonous carbon monoxide that, if respiration may lead to loss of consciousness and death.
- In case you have to operate the engine in a covered area the air can be seriously polluted by the carbon monoxide gas. Adequate ventilation must therefore be provided.

Manufacturer:

ANADOLU MOTOR ÜRETİM VE PAZARLAMA A.Ş.

2010

3. SAFETY LABELS

Safety label locations

Safety labels warn you of potential hazards that can cause serious injury. Read the labels and the safety notes and precautions described in this manual. If a safety label comes off or becomes difficult to read, contact your dealer for replacement.

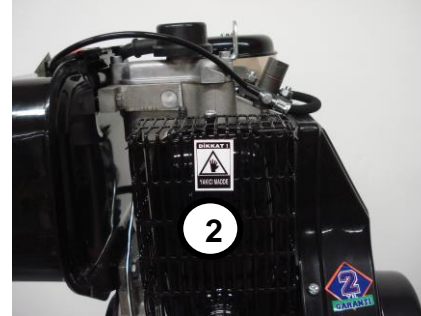
[1] On engine fuel tank :

Safety label for : Fuel is flammable , Fuel is poisonous, Danger , Read User's Manual



[2] On the exhaust muffler :

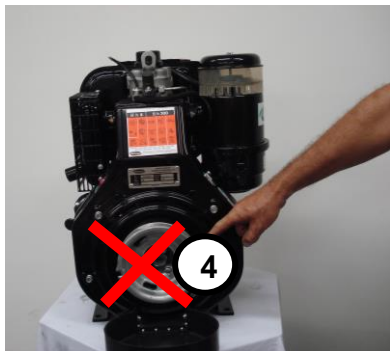
Safety label for : High temperature , Burning hazard.



[3] On the engine :

Safety label for : Read User's Manual before starting the engine.





[4] Depending on the engine version and equipment :

Do not run the engine with pulley protection open.
Do not put your hand in the area of moving parts.

4. ENGINE IDENTIFICATION PLATE



ENGINE MODEL :

ENGINE SERIAL NR.:

DATE PURCHASED :

Write down the engine's serial number on the "Use and Maintenance Manual" for your future reference. Refer to the serial numbers when ordering parts or when making technical or warranty inquiries. This will also be useful for the local authorities in case your product is stolen.

The type and serial number of the engine are stamped on the identification plate, riveted to front air shroud.

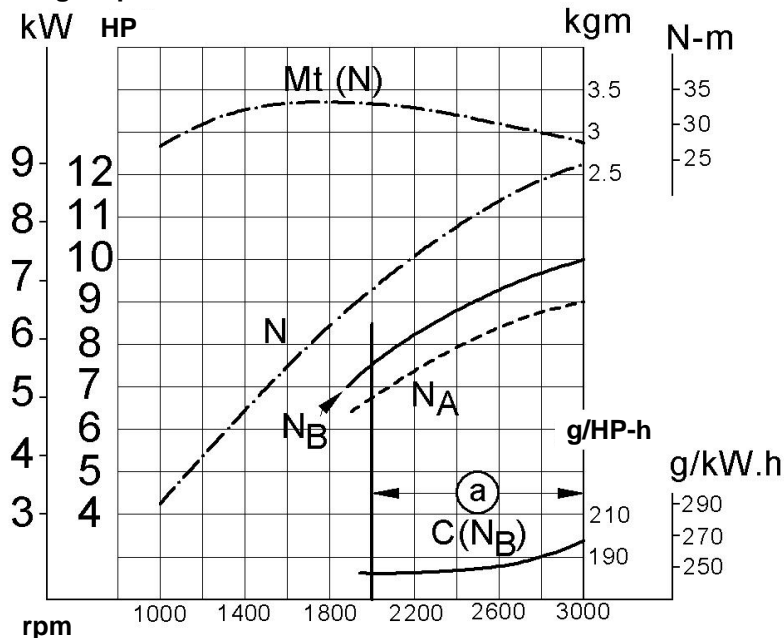
The engine serial number is also stamped on the engine block.

Technical specifications

Engine model		3LD510		
Engine type		4-stroke, direct injection, Diesel engine		
Number of cylinders		1		
Displacement - cu.cm		510		
Bore x Stroke - mm x mm		85 x 90		
Compression ratio		17,5 : 1		
Max.engine speed - rpm		3000		
Max.power - HP (kW) @ rpm	N (DIN 70020)	12,0 (9,0) @ 3000		
	NB (DIN 6271)	10,0 (7,3) @ 3000		
	NA (DIN 6271)	9,0 (6,6) @ 3000		
Maximum torque - N-m@ rpm		32,8 @ 1800		
Starting		Rope	Recoil mechanism	Electric start
Dry weight - kg		62	64	73
Fuel consumption - Liters/h		1,9 (at NB power)		
Oil consumption - grams/h		8		
Fuel tank capacity - Liters		5,3		
Oil pan capacity - Liters		1,75		
Cooling		Forced air cooling		
Cooling air requirement		540 cu.m/h @ 3000 rpm		
Lubrication		Pressure lubrication by oil pump and rocker arms shaft pres.lubrication		
Air filter		Oil bath type or oil bath type with cyclone pre-filter		
Air filter oil bowl capacity - Liters		0,30		
Max.inclination - short duration		35°		
Max.inclination - up to 1 hour		30°		
Max.axial load on crankshaft (thrust)		250 kg		
Power take off		Dia. 24 mm , 1:5 taper crankshaft end , counterclockwise		

5. TECHNICAL SPECIFICATIONS

Engine performance curves



Ratings refer to standart engines with completed run-in. Rating will drop 1% for every 100 m altitude and 2% for every temperature increase of 5° above 20°C.

Notes on engine power ratings

N (DIN 70020) [Automotive rating] :

For intermittent duty operation at variable speed and load.

NB (DIN 6270) [Rating with no overload capacity]:

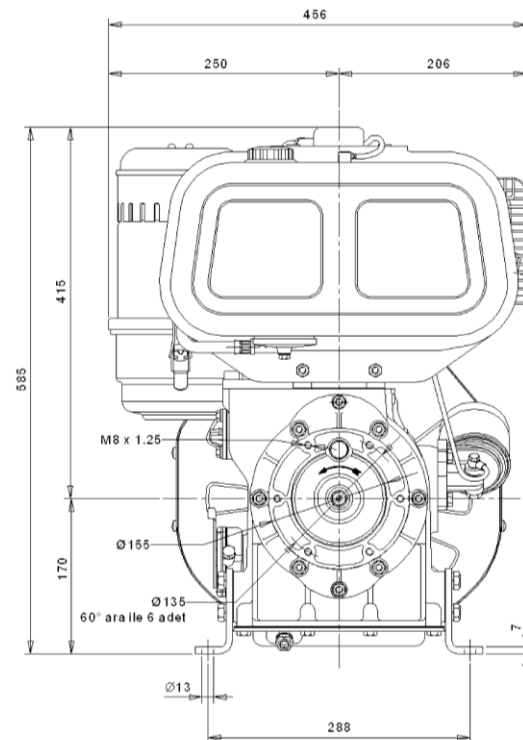
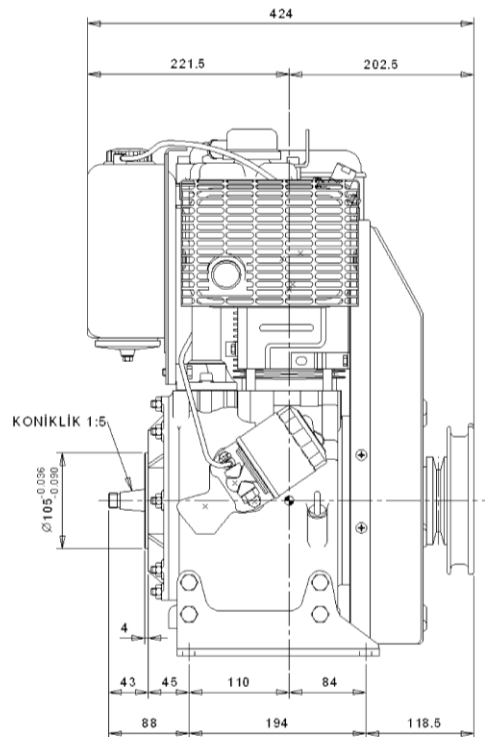
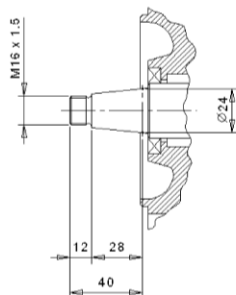
For continuous light duty operation with constant speed and variable load.

NA (DIN 6270) [Continuous rating with overload capacity] :

For continuous heavy duty operation with constant speed and load.

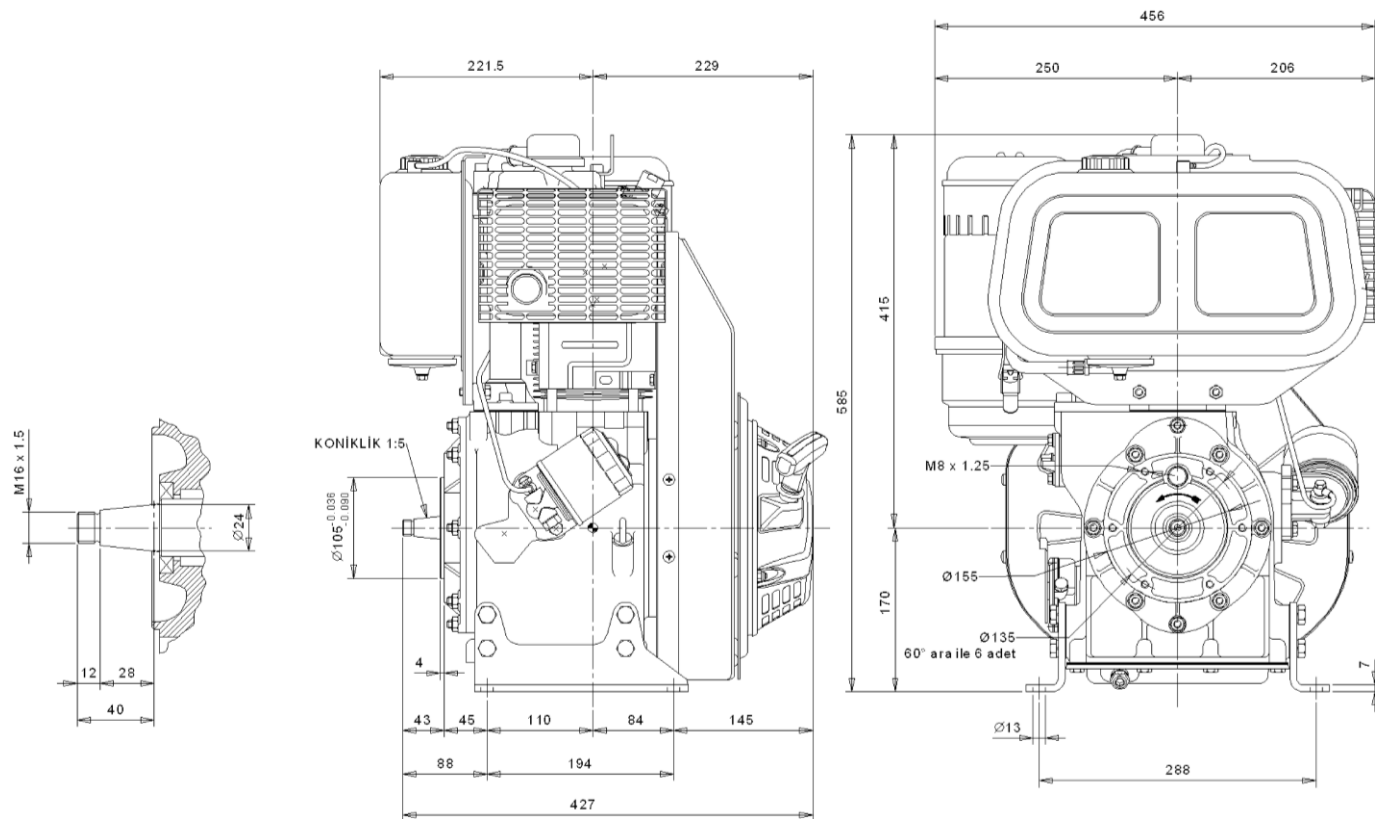
External dimensions - 3LD510 Rope start

Pulley protection is not shown. Will vary according to equipment.

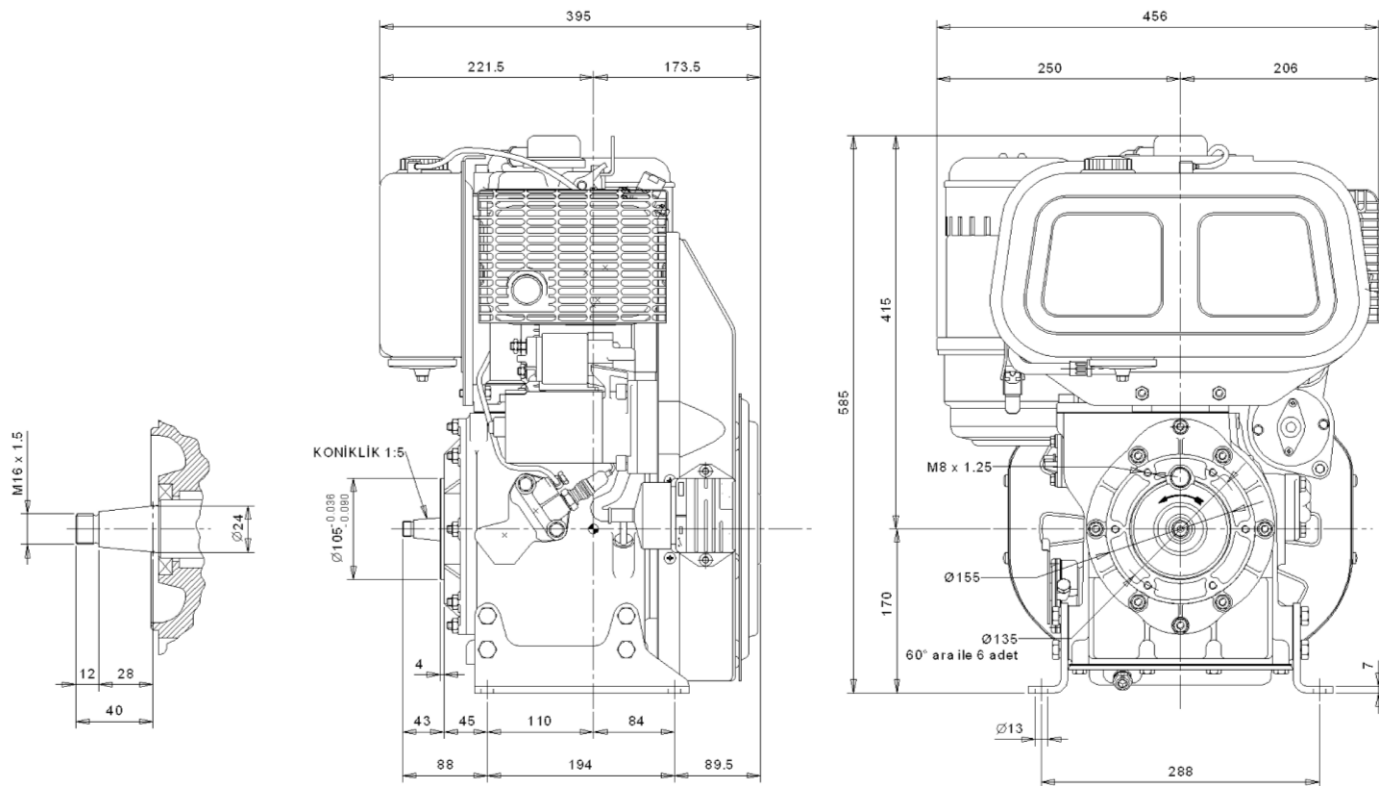


5. TECHNICAL SPECIFICATIONS

External dimensions - 3LD510 Automatic recoil mechanism



External dimensions - 3LD510 Electric start



6. OPERATION

Engine oil

Use SAE 20W-50 or equivalent, multigrade, 4-stroke diesel engine oil.

Run-in period

During the first 50 running hours avoid running the engine at maximum speed and do not exceed 70% of the maximum load.

Fill oil and fuel before starting

1. Remove oil filling /air breather cap.



2. Fill with recommended type fresh oil.



3. Replace the oil filling cap securely.



4. Check oil level with engine at horizontal position.



5. Loosen hooks and remove bowl and filtering element.



6. Fill bowl with clean engine oil up to the marked level.



7. Replace the bowl securely and lock with the hooks.



8. Open the fuel tank cap.

6. OPERATION



In case of ambient temperature below -10°C Diesel fuel becomes very thick or freezes. Kerosene must be added at shown proportions to assure proper fuel flow.

Temperature	Kerosene	Diesel fuel
- 10°C	%10	%90
- 20°C	%25	%75
- 30°C	%40	%60
- 40°C	%55	%45

9. Fill tank with filtered or decanted Diesel fuel.



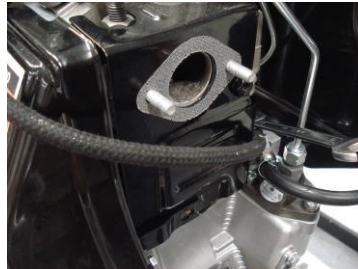
CAUTION !

Do not overfill the fuel tank. Level must be 2 cm below neck. Fuel expands when heated and starts to leak.

Bleeding the fuel system (except engines with automatic bleeding system)



10. Loosen fuel pump bleeding bolt.



11. Wait for the last air bubbles to come out.



12. Tighten the bleeding bolt.

For engines with cold starting tap, at low ambient temperatures



13. Remove starter plug.



14. Pour a few drops of clean engine oil in the cup.



15. Close plug securely.



CAUTION !

Starter plug must be tightly installed while the engine is running. Otherwise dust will enter the engine and cause premature wear of piston, piston rings and cylinder liner.

Extra fuel device



16. Bring throttle lever to middle position.



17. Pull extra fuel knob without turning it.

NOTE:

Extra fuel device assures extra fuel injection to facilitate start up. Once the engine starts to run the knob returns automatically to normal running position.

6. OPERATION

Rope starting (Depending on the coupled equipment)



18. Wrap starting rope around pulley in the direction of the arrow.



19. Pull rope slowly until compression resistance is felt and creaking of the injector is heard.



20. Pass the top dead center, rewind the rope and pull strongly all the way.



WARNING !

Hold starting rope grip strongly with both hands. Stand firmly on the ground while pulling the rope. Be sure that there are no people or object behind you.

Starting with automatic recoil mechanism



18. Open the decompression lever. Lever will stay at open position.



19. Pull rope slowly until compression pressure is felt and pass the top dead center.



20. Allow rope to rewind than pull strongly.



CAUTION!

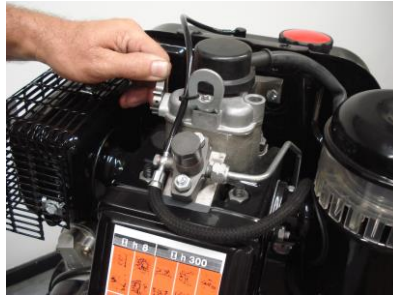
Do not allow the starter grip to snap back against the engine. Return it gently to prevent damage to the recoil mechanism.

6. OPERATION

Electric starting



18. Turn the engine switch clockwise to the ON position. Warning lights will light.



19. Open the decompression lever and hold it in position.



20. Turn engine switch further clockwise to START position to run the starter motor. Release the decompression lever when engine speeds up.

NOTE:

Recoil mechanism types: The decompression lever will automatically return to normal (running) position when the engines starts to turn.

Electric start types :The engine will not start to run until the decompression lever is released. When released, the decompression lever returns back to its normal running position.

NOTE:

The starter motor consumes a large amount of current. Do not run it continuously for more than 5 seconds at a time. If the engine does not start within 5 seconds wait about 10 seconds before running the starter motor again.

NOTE:

When released, the engine switch key returns back to its normal running (ON) position.

When the engine starts to run

21. With engine running, set speed with lever and secure it in this position by tightening the wing nut.

NOTE :

Heat the engine at idle speed or partial load before fully loading it.

NOTE :

During the first 50 running hours avoid running the engine at maximum speed and do not exceed 70% of the maximum load.

**CAUTION !**

In electric start engines oil pressure and charging warning lights must go off after the engine has started. If any of the warning light continues to light (ON) stop the engine immediately and see the cause of the trouble.

6. OPERATION

Stopping the engine



22. Put the accelerator lever to the idle position and run the engine at idle speed to cool it.



23. Turn the stop knob counterclockwise and hold it in that position until engine stops.



24. For electric start engines turn switch key counter clockwise to OFF position.

NOTE :

Do not stop the engine suddenly while running at full load.



CAUTION !

For electric start engines, do not leave the engine switch key at ON position while the engine is not running. This will cause the voltage regulator to break down and the battery to discharge.

Periodical maintenance and adjustments are important to keep the engine in the best operating condition.

Use only genuine ANTOR parts for maintenance or repair.

Imitation parts which may not conform to manufacturer's specifications, will not have a good performance, may damage your engine and will make the guarantee terms void.

Each time before starting the engine

1. Check engine oil level, fill to the upper level with recommended fresh oil if needed.
2. Check fuel level in the tank; doing so you will not have to stop the engine to refuel and interrupt your work.
3. Check the tightness of the fastening elements such as bolt, nuts, screws etc. on the engine and the equipment. Loose parts may cause big damages and lead to personal injuries.

Periodical maintenance operations are outlined in the below Maintenance Schedule . Maintenance operations that can be done by the user are also explained with figures.

In case you do not have the necessary technical skill and tools to perform the maintenance operations please have them done by an Anadolu Motor Authorized Service.



WARNING !

Before attempting to perform any maintenance operation on the engine , stop the engine. If the engine has to run during the maintenance operation make sure that the area is adequately ventilated.



WARNING !

Used engine oil contains substances that may cause skin cancer. Wash your hands with plenty of water and soap after being in contact with used engine oil.

Dispose of used engine oil in a manner not to pollute the environment. Take it into a sealed container to your local service station. Do not put it into trash, garbage or do not pour it to the ground, to the sea or into the river.

Please note the following points while running the engine or performing maintenance operations :



Do not touch hot surfaces while the engine is running or hot.



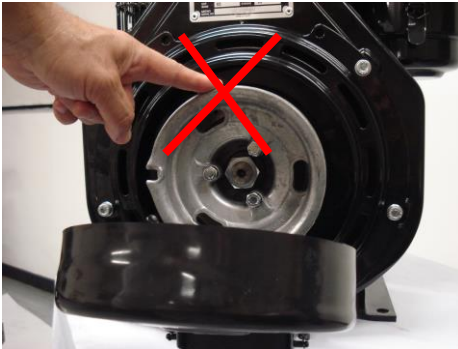
Do not remove oil level dipstick while the engine is running.



Do not inhale exhaust gases.



Do not stay in confined area with engine running.



Do not touch moving or rotating parts.



WARNING !

Noise level may exceed 111 dB with engine running at full load. Use earcuffs to protect your hearing.

7. MAINTENANCE

Maintenance schedule

Item	Operation	Frequency (operating hours)							
		10	50	125	250	500	1000	2500	5000
Engine oil	Check	O							
	Change		▲	O					
Engine oil filter	Change		▲		O				
Air filter upper body	Clean			O (1)					
Air filter oil	Check	O (1)							
	Change	O (1)							
Fuel filter	Change		▲		O				
Battery electrolyte level (el.start type)	Check		O						
Oil filling/breather cap	Clean			O					
Fuel injector	Check/Adjust					O (2)			
Fuel tank	Clean						O (2)		
Fuel hoses/pipes/connections	Check / Tighten					O			
Valve-rocker arm clearances	Check / Adjust					O (2)			
Cooling fins	Clean				O (1)(2)				
Partial overhaul								O (2)	
General overhaul									O (2)

▲ : Change engine oil after the first 50 hours of operation.

(1) : Must be serviced more frequently in dusty environments.

(2) : These operations must be done at Anadolu Motor Authorized Services.



EVERY 10 HOURS



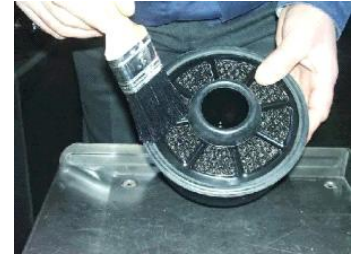
Check oil level with engine at horizontal position.



Clean air filter: Loosen hooks and remove bowl.



Remove air filter element.



Clean wash with kerosene /gasoil or solvent .



Dry air filter element with compressed air.



Empty dirty oil from bowl and clean wash with kerosene or gasoil .



Fill bowl with clean engine oil up to the marked level.



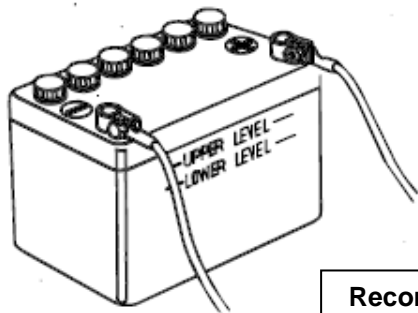
Reassemble air cleaner.

7. MAINTENANCE



EVERY 50 HOURS

Battery maintenance (electric start type)



**Recommended battery :
12 Volt , 60 A-h**

NOTE :

Battery handling differs according to the type of the battery. The instructions below may not be applicable to battery of your engine. See battery manufacturer's instructions.

Check that the battery cables are connected securely. If the battery terminals are corroded or contaminated remove the battery and clean the terminals.

Battery check interval : Before each use.



WARNING!

Batteries produce explosive gases while being charged. If ignited an explosion can cause serious injury or blindness. Provide adequate ventilation when charging.

- **CHEMICAL HAZARD :** Battery electrolyte contains sulphuric acid. Contact with eyes or skin, even clothing may cause severe burns. Wear a faceshield and protective clothing.
- Keep flames and sparks away. Do not smoke in the area.
- If electrolyte gets into your eyes, flush thoroughly with warm water at least 15 minutes and call a physician immediately.
- Electrolyte is a poison ; in case you have swallowed it by mistake drink large quantities of water or milk, milk of magnesia or vegetable oil. Call a physician immediately.

KEEP THE BATTERY OUT OF REACH OF CHILDREN.

**EVERY 125 HOURS****Cleaning of the oil filling /breather cap**

Remove the oil filling/
breather cap.



Clean the cap with
kerosene.



Dry the cap with
compressed air.



Replace and tighten the oil
filling/breather cap.

7. MAINTENANCE



EVERY 125 HOURS

Cleaning the air filter upper body



Loosen hooks and remove air filter bowl.



Loosen fixing nuts of air filter upper body.



Remove air filter upper body.



Clean upper body and foam element with kerosene or solvent.



Dry with compressed air. Squeeze foam element and allow to dry.



Reassemble air filter upper body.



Tighten the fixing nuts securely.



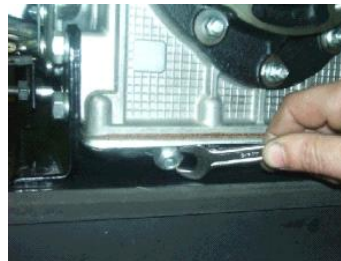
Fill the bowl with oil up to level mark and reassemble air filter.

**EVERY 125 HOURS****Changing engine oil**

Place a suitable tray under the oil sump . Loosen the oil drain tap.



Drain the engine oil into the tray.



Replace the oil drain tap and tighten securely .



Remove the oil filling/breather cap.



Fill with recommended type of oil.



Replace the oil filling/breather cap and tighten securely.



Check engine oil level with engine at horizontal position.

7. MAINTENANCE



EVERY 250 HOURS

Changing engine oil filter

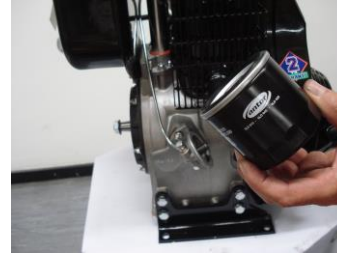
(Engine oil must also be changed while changing the engine oil filter)



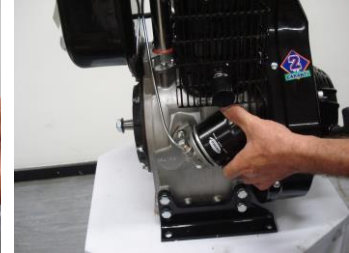
Remove oil filter by unscrewing it. Empty the oil in the filter into a suitable container.



Dispose of the used filter by giving it to your service station.



Lubricate new filters rubber gasket with clean engine oil.



Install the oil filter by tightening with hand.

You may need a commercially available clamp to remove the oil filter .

Tighten the new oil filter by hand only. Do not use a clamp or any other tool.

Dispose of used engine oil, oil filter, fuel filter, oiled rags etc in a manner to protect the environment. Do not throw them in the garbage or pour on the ground or in the sea, river etc. Take them in a sealed container to your local service station for reclamation according to the environment protection rules.

**EVERY 250 HOURS**

Changing the fuel filter



Place a suitable tray under the fuel tank and loosen the filter cover fixing bolt.



Drain the fuel tank completely ,then remove the bolt ,cover and filter cartridge .



Install new filter cartridge with new gaskets.



Reassemble filter cover and tighten fixing bolt.

NOTE :

Check that the fuel hose of the filter cover is not damaged or cracked or leaking. Replace the hose+cover assembly if necessary. Check that the fuel filter cover and sealing gasket sit properly in the fuel tank . Fill the fuel tank with fuel and check for leaks.

7. MAINTENANCE



EVERY 250 HOURS

Cleaning the engine cooling fins (*)



Remove air shroud fixing screws.



Remove air shroud.



Clean the cooling fins of cylinder and cylinder head with a brush and kerosene.



Dry the cleaned cooling fins with compressed air.

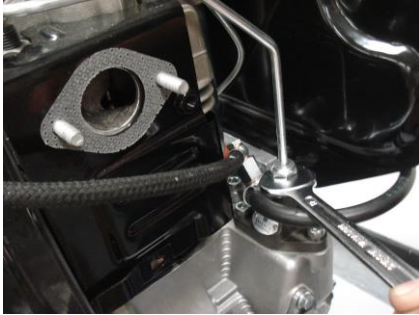
(*) NOTE :

Depending of engine version removal of rope pulley, flywheel, air shroud, air filter, exhaust muffler and side panels may be necessary to clean the cooling fins. These operations necessitate special tools and skills and must be done at authorized service stations.



EVERY 500 HOURS

Tightening the fuel injection pipe unions



Tighten the fuel injection pipe union nut (injection pump side).



Tighten the fuel injection pipe union nut (injector side).

7. MAINTENANCE



EVERY 500 HOURS



Check valve-rocker arm clearances and adjust if necessary.

Valve clearance (cold engine) :
0,15 - 0,20 mm



Check injector nozzle opening pressure and adjust if necessary.

Injector nozzle opening pressure :
190 - 200 kg/cm²

NOTE :

These operations necessitate special tools and skills and must be done at authorized service stations.

1. Engine does not start

Probable cause	Remedy
Dirt in the fuel system. Water in the fuel system.	Clean fuel filter,fuel pipe and hose.Change fuel.
Fuel becomes too thick to flow freely.	Use Diesel fuel up to the specifications.
There is air in the fuel system.	Bleed the air in the fuel system.
Improper fuel injection.	Clean injector nozzle and injection pump.Replace injector and pump if necessary. (*)
Incomplete combustion .	Injector nozzle is clogged and must be cleaned, injection angle is incorrect, cyl.head gasket is leaking and compression pressure is not sufficient. Check the related parts. (*)
Interruption in fuel delivery.	Not enough fuel in the tank; add fuel. Check fuel hose and filter for obstructions, clean if necessary.
Insufficient compression pressure.Cylinder head nuts not properly tightened. Cylinder head gasket is leaking.	Tighten cylinder head nuts in proper order and to the correct torque. Check cylinder head gasket. In case new cylinder head gasket is used tighten cylinder head nuts to the correct torque once again before starting the engine. (*)
Piston rings gaps too high because of wear.	Replace piston rings. (*)
Piston rings gaps are lined causing compression loss.	Set piston rings gaps at 120° angle. (*)
Piston rings stuck in their grooves or broken.	Clean piston rings and grooves or replace piston rings. (*)
Valves leaking.	Grind/lap valves and seats or replace valves. (*)
Incorrect valve clearance.	Adjust clearances as specified. (*)
Valve stem stuck to the valve guide	Disassemble valve and clean. (*)

8. TROUBLESHOOTING TABLE

2. Insufficient power

Probable cause	Remedy
Clogging in fuel filter or fuel lines	Check whether fuel valve is open (if equipped). Check/clean fuel filter and fuel lines.
Insufficient pumping of fuel.	Check fuel injection pump, replace faulty parts.(*)
Insufficient pulverization of fuel, injector nozzle faulty or low injection pressure.	Check injector.Adjust injector opening pressure.(*)
Carbon deposits on injector nozzle.	Clean.(*)
Valve stem stuck to the valve guide.	Disassemble valve and clean.(*)
Incorrect valve clearance.	Adjust clearances as specified. (*)
Air filter clogged.	Clean air filter, replace elements if necessary.
Low engine rpm	Check engine speed with a tachometer, adjust if necessary (*)

3. Engine stops

Probable cause	Remedy
No fuel in the tank	Fill fuel
Clogging in fuel filter or fuel lines	Check/clean fuel filter and fuel lines.
Air in the fuel system.	Bleed the fuel system.
Injector nozzle needle stuck	Clean injector nozzle needle, replace nozzle if necessary.(*)
Air filter clogged.	Clean air filter, replace elements if necessary.

4. Black smoke from the exhaust

Probable cause	Remedy
Engine is overloaded	Reduce load, check whether the equipment is suitable to the characteristics of the engine. Consult your Dealer for correct equipment for the engine. (1)
Insufficient pulverization of fuel, injector nozzle faulty or low injection pressure.	Check injection pressure and the pulverization of the fuel. Check and adjust injector, injection pump and timing. Replace injector or pump if necessary. (*)
Air filter clogged.	Clean air filter, replace elements if necessary.

5. Blue smoke from the exhaust

Probable cause	Remedy
Oil accumulation in the cylinder.	Check oil level. Drain surplus amount of oil off.
Piston rings gaps are lined causing oil passage into the combustion chamber.	Set piston rings gaps at 120° angle. (*)
Too much clearance between piston and cylinder.	Measure and replace piston and ring.Re-bore or replace cylinder if necessary. (*)

6. White smoke from the exhaust

Probable cause	Remedy
Water in fuel.	Clean the fuel tank,fuel lines and fuel filter.Fill with decanted and filtered clean Diesel fuel.

8. TROUBLESHOOTING TABLE

7. Engine does not run smoothly

Probable cause	Remedy
Engine speed is not steady.	Check the functioning of the speed regulator. Check fuel system , bleed air if necessary.(*)
Abnormal noises.	Check every moving/loose part carefully.(*)
Sudden black smoke from the exhaust.	Check fuel system, especially the injector nozzle.(*)

(*) These operations must be done at Anadolu Motor Authorized Service Stations.

(1) In case the equipment is not suitable to the characteristics of the engine the engine will be overloaded and will not give its full power. The efficiency will be reduced and the engine will break down at a very short time. Damages resulting from coupling the engine to an incorrect equipment will not be covered by our warranty. Consult your Dealer for the selection of the correct type of equipment.

NOTE:

Damages and problems arising from the repairs or interventions by unauthorized persons will not be covered by our warranty.

9. STORAGE OF THE ENGINE

In case you will not use your engine for a long period of time (1 - 6 months) take the following precautions:

- a. Clean the air filter
- b. Drain fuel and replace fuel filter.
- c. Change engine oil and replace oil filter.
- d. Clean and dry the cooling fins and the exterior of the engine.
- e. Lubricate cylinder inner walls as follows :



Disconnect injection pipe union (Injector side).



Remove injector fixing nuts.



Remove injector from cylinder head.



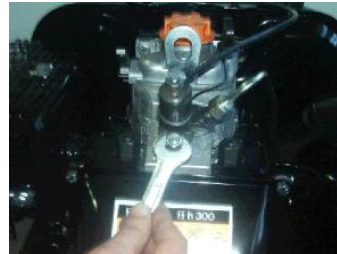
Pour a tablespoon of clean engine oil into the cylinder.



Turn the engine a couple of turns to distribute the oil in the cylinder.



Replace the injector.



Tighten the injector fixing nuts.



Reconnect the injection pipe union (injector side).

9. STORAGE OF THE ENGINE

f. Store the engine as follows:



Turn the engine crankshaft clockwise to bring it to the top dead center of the compression stroke. This way, both valves will be closed.



Close the exhaust opening with a sticky band.



Close the intake opening with a sticky band.



Cover the engine with plastic bag and store in a dry place.

NOTE:

Proper storage preparation is essential for keeping your engine trouble-free and looking good. This will make your engine easier to start when you use it again.

If the cylinder was coated with oil during storage preparation, the engine may smoke briefly at startup. This is normal.

For electric start types ;

Please note the following points:

- In case the engine is mounted on rubber mounts, it is necessary to make a separate grounding to the chassis.
- The negative (-) battery cable must be connected directly to the engine.
- The engine switch must be in OFF position when the engine is not running. Otherwise the voltage regulator will be damaged and the battery will be discharged.
- The engine switch must be in ON position when the engine is running. Otherwise the alternator will not charge the battery and the warning lamps will not function.

- The battery cables must not be disconnected while the engine is running. Otherwise the voltage regulator will be damaged.
- The temperature of the voltage regulator must not exceed 75°C.
- No electric welding operation must be performed on the chassis or equipment coupled to the engine while the electric system is connected.

10. ELECTRIC WIRING DIAGRAM

Electric wiring diagram [Electric start types] (Flywheel alternator, voltage regulator for battery charging)

