WORKSHOP MANUAL

KOHLER® KDW 1603 - 2204 - 2204/T



KOHLER® ENGINES

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POSSIBLE CAUSES AND TROUBLE SHOOTING

THE ENGINE MUST BE STOPPED IMMEDIATELY WHEN:

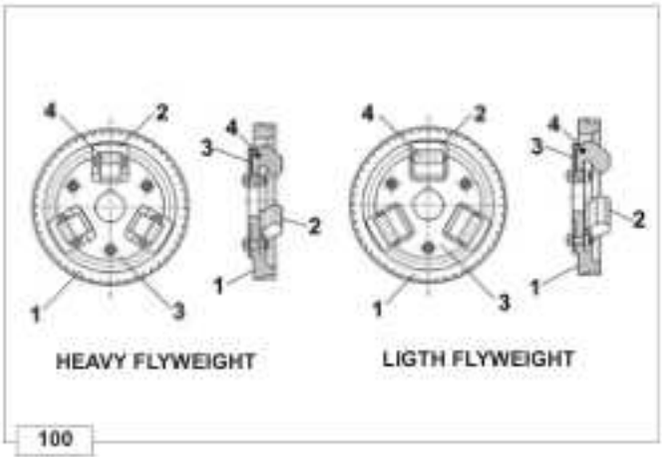
1) - The engine rpms suddenly increase and decrease
2) - A sudden and unusual noise is heard
3) - The colour of the exhaust fumes suddenly darkens
4) - The oil pressure indicator light turns on while running.

TABLE OF LIKELY ANOMALIES AND THEIR SYMPTOMS

The following table contains the possible causes of some failures which may occur during operation.
Always perform these simple checks before removing or replacing any part.

	POSSIBLE CAUSE	TROUBLE										
		Engine does not start	Engine starts but stops	No acceleration	Non-uniform speed	Black smoke	White smoke	Too low oil pressure	Overheats	Inadequate performance	Excessive oil consumption	High noise level
FUEL CIRCUIT	Obstructed fuel line	■	■		■					■		
	Fuel filter clogged	■	■	■	■					■		
	Air or water leaks in fuel system	■	■	■	■		■			■		
	The tank cap vent hole is clogged	■	■	■						■		
	No fuel	■	■									
ELECTRIC SYSTEM	Discharged battery	■										
	Cable connection uncertain or incorrect	■										
	Faulty starting switch	■										
	Faulty starting motor	■										
	Faulty glow plugs	■					■					
	Faulty glow plug control relay	■										
	Burnt fuse on preheating spark plugs	■										
MAINTE-NANCE	Clogged air filter		■	■		■				■		
	Excessive idle operation						■				■	
	Incomplete run-in						■			■	■	
	Overloaded engine		■	■		■			■		■	
SETTINGS REPAIRS	Incorrect governor linkage adjustment	■			■					■		
	Governor spring broken or unhooked		■	■								
	Low idle speed		■		■	■						
	Rings worn or sticking	■					■		■	■	■	
	Worn cylinder	■					■		■	■	■	
	Worn main con rod-rocker arm bearings							■	■	■	■	
	Badly sealed intake valve								■	■	■	
	Damaged cylinder head gasket	■		■	■				■	■	■	■
	Defective timing system											■
	Bent rods									■		■
	Faulty hydraulic tappets									■		■

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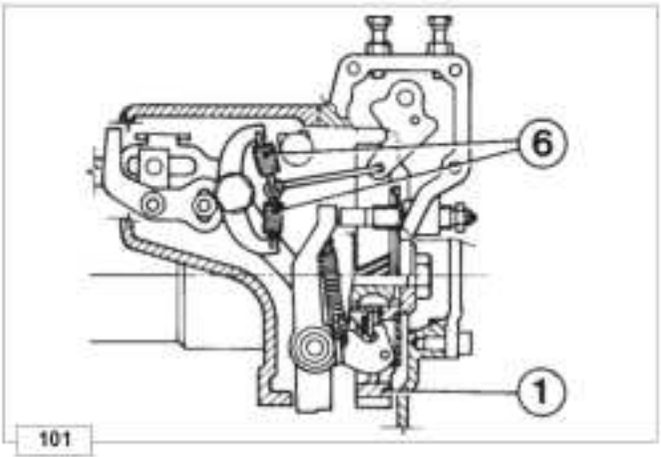


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Camshaft gear - Speed governor counter weights

Components:
1 Camshaft gear
2 Governor weights
3 Governor weight support
4 Governor weight pin

The governor weights **2** are housed inside the camshaft gear **1**.
The weights **2** can be of two types: light or heavy, depending on the speed rate and the type of application.
Heavy weights for engines set to run at low rpm (1500 - 1800 rpm and agricultural applications), light weights for engines set to run at high rpm (2200 - 3000 rpm).

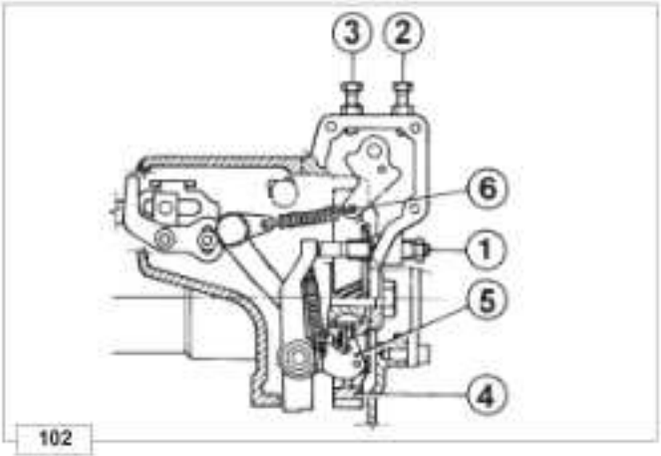


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Speed governor counter springs

Besides the weights used according to the speed rate and application type, different types of springs with different features are used as well.

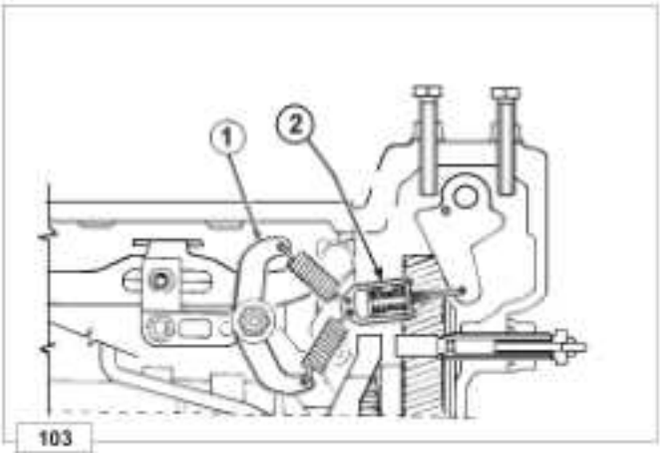
Components:
1 Camshaft gear
6 Speed governor springs



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Components:
1 Limiting device / torque gearing device
2 Maximum rpm adjustment screw
3 Minimum rpm adjustment screw
4 Camshaft gear
5 Governor weight
6 Speed governor spring

For engines used on generating sets it is preferable to fit a single spring **6** to act against the heavy governor weights to avoid hunting with variations in the load and to achieve a more constant frequency over time.



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Frame with idling speed governor spring

Engines for applications requiring a certain power capacity at low speeds are fitted with the frame **2** complete with the idling speed spring which allows satsifying the above described requirements without the engine tending to stop.

Components:
1 Rocker arm with speed governor springs.
2 Frame for idling speed spring

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Wiring diagram 24 V with alternator 35A

1 Alternator
2 Starter Motor
3 Battery (See below for sizing details)
4 Glow Plugs
5 Thermistor (Glow Plug Controller Circuit)
6 Glow Plug Controller / Timer
7 Key Switch
8 System Fuse
9 Fuse (Accessory)
10 Fuel Valve
11 Glow Plug Indicator Lamp
12 Coolant High Temperature Lamp
13 Coolant High Temperature Switch (N.O.)
14 Oil Pressure (Low) Lamp
15 Oil Pressure Switch (N.C.)
16 Alternator Charging Lamp (Off if Charging)
17 Diode
18 Air Filter High Restriction Indicator
19 Air Filter Restriction Switch (N.O.)
20 Low Fuel Level Lamp
21 Low Fuel Level Switch (N.O.)

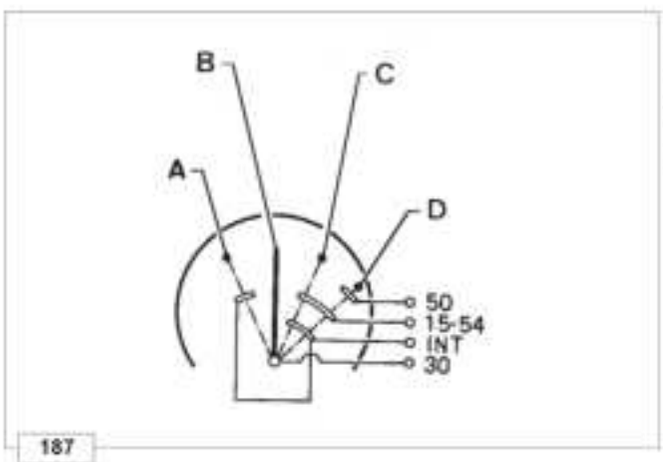
A Accessory
B Off Position
C On Position
D Starting Position

Battery **3** is not supplied by KOHLER.

Battery not supplied. Ground rubber mounted engines.

RECOMMENDED BATTERIES

In Standard Start Conditions	In Heavy-Duty Start Conditions
12 V - 92 Ah/450 A/DIN **12 V - 92 Ah/880 A/EN** **12 V - 92 Ah/715 A/SAE**	**12 V - 110 Ah/500 A/DIN** **12 V - 110 Ah/980 A/EN** **12 V - 110 Ah/790 A/SAE**



Key switch electrical layout

A = Accessory
B = Off position
C = On position
D = Starting position

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Safety

Explanation of the safety pictograms that can be found on the engine or in the Operation and Maintenance handbook


Read the Operation and Maintenance handbook before performing any operation on the engine


High temperature components - Danger of scalding


Presence of rotating parts - Danger of entangling and cutting


Presence of explosive fuel - Danger of fire or explosion


Presence of steam and pressurized coolant - Danger of scalding


Use protective gloves before carrying out the operation


Use protective glasses before carrying out the operation


Use sound absorbing protections before carrying out the operation


Electric shock - Danger of severe scalding or death

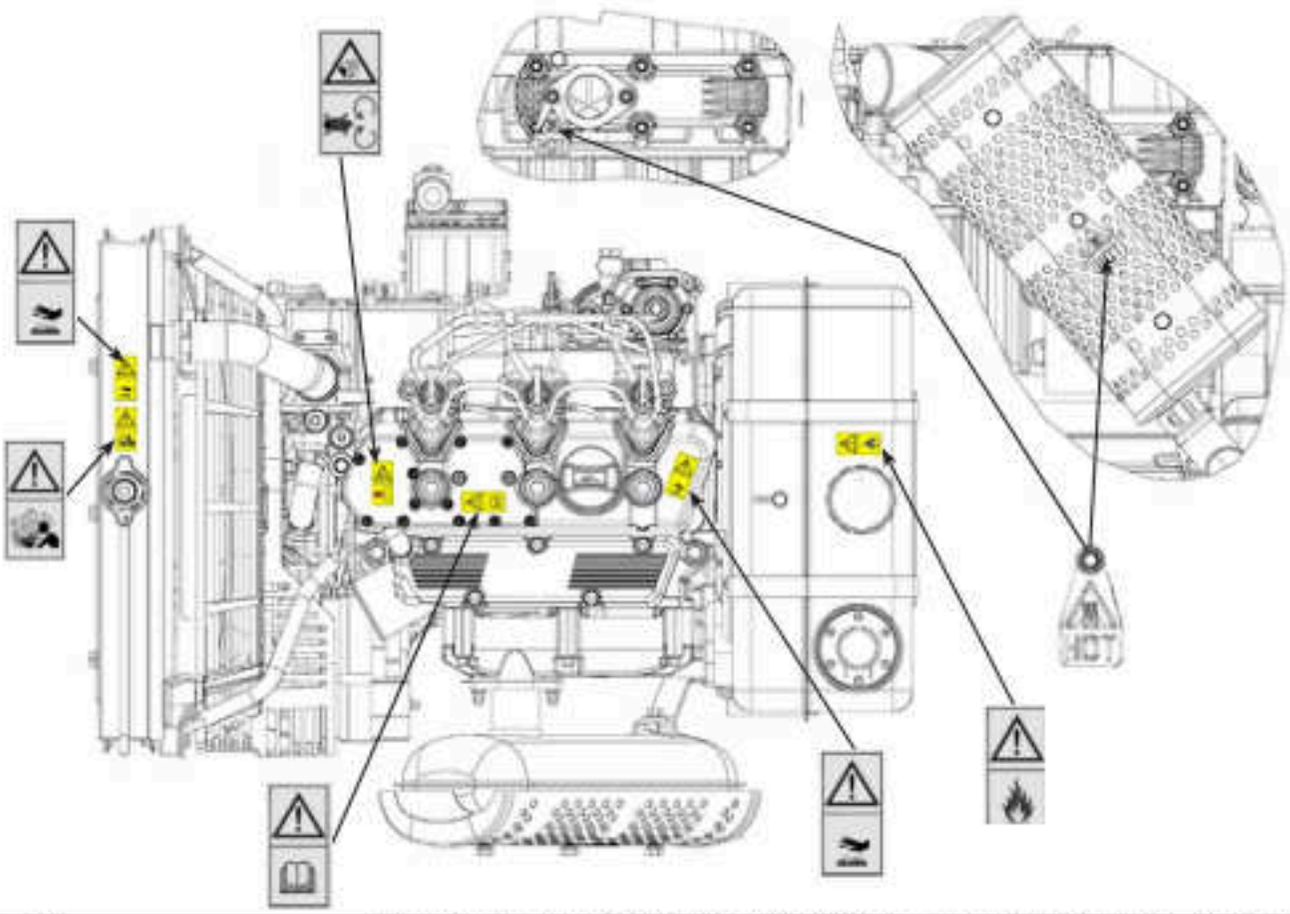
Fluids under high pressure - Danger of fluids penetration


Lethal exhaust gas - Danger of poisoning or death





Indications regarding the points on the engine where the safety pictograms are placed



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