Headland IC1

ESL fuels

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23 JUL 2014

Green Flame Material Safety Data Sheet

Version 1. Effective Date 23.06.2009 according to directive 91/155/EEC - 2001/58/EC UK

MONITORING RETURNS N. WALES

	INITIALS	DATE
CHECKED Vs AUTHORISATION	AZ	26/6/14
TRACKING	JB	30.7.14
OK FOR PUBLIC REGISTER	AZ	30/7/14
SENT TO PUBLIC REGISTER	JB	EDRM

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E: info@eslfuels.com www.eslfuels.com

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product name :	GreenFlame
Chemical product name :	Preparation
Product type and main use :	Fuel
Supplier :	Ebony Solutions Ltd Wincham Lane, Wincham Northwich, Cheshire CW9 6DE
Telephone :	01606 301 222
Fax :	01606 872 666
Emergency telephone number :	+44 (0)160 630 1222
Website:	www.eslfuels.com

2. HAZARDS IDENTIFICATION

The substance is classified as dangerous according to Directive 67/548/EEC and its amendments.

Classification :	Carc. Cat. 3; R40 Xn; R65 Xi; R38 R66 N; R51/53
Physical/chemical hazards :	The product is not classified as flammable but consists of hydro-carbons and can burn. Vapours may form explosive mixtures with air.
Health hazard :	May cause irreversible effects. Aspiration of product into the lungs, either directly or as a consequence of vomiting following ingestion, may result in damage to lung tissue. Vapours may irritate eyes and respiratory system. High doses may cause nausea and headaches.
Environmental hazards :	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Release of the product into water will result in a film of hydrocarbons floating on the surface. Due to low water solubility the predominant loss is through volatilisation. Molecules with higher molecular weight will be absorbed on sediment.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/preparation : Preparation

Chemical name*	CAS no.	EC Number	%	Classification
Diesel, fuels	68334-30-5	269-822-7	60 - 80	Carc. Cat. 3; R40 Xn; R65 R66
Kerosine (petroleum),	8008-20-6	232-366-4	20 - 40	Xn; R65 Xi; R38 N; R51/53

See Section 16 for the full text of the R Phrases declared above, if applicable.

*** Occupational Exposure Limit(s), if available, are listed in Section 8**

4. FIRST AID MEASURES

Inhalation : If symptoms arise from inhalation of the product, remove to fresh air. Keep the casualty warm and at rest. If unconscious place in recovery position and give oxygen if possible. Monitor breathing and pulse. If necessary assist breathing. Give external cardiac massage if possible. Get medical attention immediately.

Eye Contact : Wash eyes with plenty of water for at least 10 minutes, making sure the eyelids are kept open. If irritation persists, seek medical attention.

Skin contact: Remove contaminated clothing and shoes. Wash contaminated skin with soap and water. If irritation persists, seek medical attention. In case of contact with hot product, rinse with plenty of water.

Ingestion : Do not give anything by mouth. Do not induce vomiting. Get medical attention immediately.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable :	In case of fire, use water spray (fog), foam, dry chemical or CO_2.
Not Suitable :	Do not use water jet.
Hazardous thermal decomposition products :	Burning product gives rise to a complex mixture of gases and airborne particles including carbon monoxide and sulphur oxides.
Special fire-fighting procedures :	Cool closed containers exposed to fire with water.
Protection of fire-fighters :	Proper protective equipment including breathing apparatus for both organic vapours and aerosols.
Specific hazard :	Risk of explosion due to increased pressure if product containers or tanks become heated due to fire.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions :	Eliminate all ignition sources. Evacuate people to upwind from leakage area. Do not allow water or any liquid to contact with hot product since this could cause splashing of hot material or boil-over.
Environmental precautions :	Do not allow to enter drains or watercourses.
Clean-up methods :	Consider the health and physical hazards of the product. Start immediately to clean up the product and contaminated soil. Small quantities can be absorbed with absorbent material (earth, sand, etc). If spill is large, call for rescue service. It is recommended to handle product remnants as hazardous waste.

Note: see section 8 for personal protective equipment and section 13 for waste disposal.

7. HANDLING AND STORAGE

Handling :

Keep away from sources of ignition. Electrostatic charges may be generated during pumping and tank filling operations. Ensure electrical continuity of all equipment by proper bonding. Vapours can spread at ground level and in low areas and form explosive mixture with air. When handling indoors, ensure good ventilation.

Storage :

Store in properly labelled containers intended for this product. Do never enter a storage tank without breathing apparatus unless the tank has been well ventilated and gas checked.

Recommended use:

Use original container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering measures :

In situations where significant fume/vapour is generated and cannot be eliminated through engineering modifications, local/general exhaust ventilation is required in order to maintain airborne concentrations below recommended exposure limits.

Hygiene measures :

Avoid exposure by inhalation and skin contact. Remove contaminated clothing and shoes. Wash contaminated skin with soap and water.

Ingredient name	Occupational exposure limits
Oil mist	EH40-WEL (United Kingdom (UK), 2002). STEL: 10 mg/m3 15 minute(s). TWA: 5 mg/m3 8 hour(s).

Personal protective equipment

Respiratory system :

Wear appropriate respirator when ventilation is inadequate (e.g. breathing apparatus or face mask with breathing through cartridge / filter type "A" (brown for organic vapours).

Skin and body :

One-piece protective coverall. Chemical resistant shoes or boots.

Hands :

Wear oil-resistant protective gloves (e.g. nitril rubber).

Eyes :

Tightly fitted goggles or safety glasses with side shields. In situations where misting or splashing into eyes is possible, goggles or face shield shall be used.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state :	Liquid.
Odour :	Solvent.
Flash point :	Closed cup: >61°C (>141.8°F)
Solubility :	Not available.
Octanol/water partition coefficient :	The product is more soluble in octanol; log(octanol/water) = 3.9 to 6
Viscosity :	Kinematic (40C): 3 to 6 cSt

10. STABILITY AND REACTIVITY

Stability :	The product is stable.
Conditions to avoid :	Heating causes evaporation of flammable vapours.
Materials to avoid :	Strong oxidising materials
Hazardous decomposition products :	Burning product gives rise to a complex mixture of gases and airborne particles including carbon monoxide and sulphur oxides.

11. TOXICOLOGICAL INFORMATION

Acute toxicity :	Due to low viscosity there is a risk of aspiration if the product enters the lungs. Data show that the product is of low toxicity order, following dermal and oral exposure. Studies indicate dermal and oral LD50 > 2000 mg/kg.
Inhalation :	Vapours may irritate eyes and respiratory system. Over-exposure could cause nausea, headache and dizziness.
Sensitization and irritation :	Repeated exposure may cause skin dryness or cracking. May cause skin irritation. There is no indication that the product is a sensitiser.
Chronic toxicity :	Harmful: possible risk of irreversible effects in contact with skin.

12. ECOLOGICAL INFORMATION

Ecotoxicity data :	No data available. Due to the low water solubility the product is not expected to cause acute aquatic toxicity.
Mobility :	In soil and sediment the product will show low mobility with adsorption being the predominant physical process. In water the product will float and spread over the surface.
Persistence/degradability :	No data available. The product is not considered to be ready biodegradable.
Bio-accumulation. :	The product has a potential to bioaccumulate. Log Kow 3.9 - 6
Other environmental effects :	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product emits Volatile Organic Compounds to the atmosphere. Release of the product into water will result in a film of hydrocarbons floating on the surface. The main fate process is expected to be slow biodegradation in soil and sediment.

13. DISPOSAL CONSIDERATIONS

Methods of disposal	
Waste of residues :	Recycling (redistillation) or incineration.
Contaminated packaging :	Through authorized contractor or collector.
European waste catalogue (EWC) :	13 07 03* other fuels (including mixtures)
Hazardous waste :	It is recommended to handle product remnants as hazardous waste.

14. TRANSPORT INFORMATION

International transport regulations

Regulatory Info	UN No.	Shipping name	Class	PG*	Label
ADR/RID Class	1202	GreenFlame or Diesel Fuel or Heating Oil, Light (flashpoint more than 61°C and not more than 100°C).	3	III	Flammable Liquid
IMDG / ADNR Class	1202	GreenFlame or Diesel Fuel or Heating Oil, Light (flashpoint more than 61°C and not more than 100°C)	3	III	Flammable Liquid
IATA Class	1202	GreenFlame or Diesel Fuel or Heating Oil, Light (flashpoint more than 61°C and not more than 100°C)	3	III	Flammable Liquid

PG* : Packing group

15. REGULATORY INFORMATION

Hazard symbol or symbols :	Harmful, Dangerous for the environment
Risk phrases :	R38- Irritating to skin. R40- Limited evidence of a carcinogenic effect. R65- Harmful: may cause lung damage if swallowed. R66- Repeated exposure may cause skin dryness or cracking. R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Safety Phrases :	S24- Avoid contact with skin. S36/37- Wear suitable protective clothing and gloves. S61- Avoid release to the environment. Refer to special instructions/safety data sheet. S62- If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.
Contains :	Diesel, fuels 269-822-7
Product use :	Classification and labelling have been performed according to EU directives 67/548/EEC, 1999/45/EC, including amendments and the intended use. Industrial applications.
Additional warning phrases :	Industrial use only.

16. OTHER INFORMATION

Full text of R-phrases referred to in sections 2 and 3 - United Kingdom (UK):

R38- Irritating to skin.
R40- Limited evidence of a carcinogenic effect.
R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R65- Harmful: may cause lung damage if swallowed.
R66- Repeated exposure may cause skin dryness or cracking.

Full text of classifications referred to in sections 2 and 3 - United Kingdom (UK):

Carc. Cat. 3 - Carcinogen Category 3
Xn - Harmful
Xi - Irritant
N - Dangerous for the environment.

References :

CONCAWE report 01/53 - Classification and labelling of petroleum substances according to the EU dangerous substances directive.

CONCAWE report 01/54 - Environmental classification of petroleum substances - summary data and rationale.

CONCAWE product dossier 97/108 - Lubricating oil basestocks.

CONCAWE report 6/05 - Classification and labelling of petroleum substances according to the EU dangerous substance directive. (CONCAWE recommendations - July 2005).

Notice to reader

The advice given in this safety data sheet reflects the current knowledge of the hazards and risks associate with the handling of the product. If the product is mixed with other materials the users shall take these into account in identifying any additional hazards and risks which might arise.

ESL fuels

HEATING OIL:

GreenFlame

Developed to compliment ESL Fuels' biodiesel range, GreenFlame is the UK's first part-renewable/recycled heating oil.

Manufactured using renewable/recycled oils as well as traditional crude oils, and with a viscosity of 35 sec, GreenFlame is a direct alternative to traditional petroleum based heating oil for the commercial environment.

With its renewable/recycled content and ultra low sulphur credentials, GreenFlame is a step in the right direction towards reducing emissions and the UK's dependence on fossil fuels.

Fully compliant to BS 2869, the British Approved Standard for heating oil, GreenFlame offers enormous commercial opportunities in applications such as factories, hotels and large public buildings which rely on significant quantities of traditional gasoil and where it can be used without modification in existing boiler systems.

- GreenFlame is produced in bulk at ESL Biofuels' Cheshire plant and is available nationwide through some of the country's leading fuel distributors.

Availability

GreenFlame is available from some of the leading fuel distributors in the North West. To request a quote, please contact 0800 33 99 77.

Specifications

BS 2869 Parameters

Test description	Specifications
Appearance	Clear & Bright
Odour	Merchantable
Density at 15 °C	0.82 - 0.85 kg/litre max
Kinematic Viscosity	2.40 - 4.5 cSt max
Cold Filter Plugging Point	-24°C
Flash Point	55 °C min
Sulphur %	0.0 - 0.1 m/m max
Sediment %	0.001 m/m max
Water Content %	0.001 v/v max
Ash Content %	0.001 m/m max
Copper Corrosion Test	Class 1
Lubricity	180 Micron
Strong Acid Number	zero

Product is marked (HMRC Statutory Marker)

Calorific Value	KJ's per Litre
Gas Oil	38,000
Kerosene	35,000
Ultra35 Heating Oil	38,000

Carlton FUELS

martindale Fuels

Emo

CPL PETROLEUM

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Latest modification date: 980601

CID: 10001

Basic data

General

Configuration and number of cylinders		In line 6
Working principle		4 stroke
Bore x stroke	mm	115 x 144
Displacement	dm^3	9.0
Compression ratio		17:1
Firing order		1 - 5 - 3 - 6 - 2 - 4
Piston speed		
at 1500 r/min	m/s	7.2
at 1800 r/min	m/s	8.6
Rotation, seen from flywheel end		Counter clockwise
Moment of inertia		
with flywheel for 14" coupling	kgm^2	2.6
Number of teeths on flywheel ring gear		158
Weight approx., excl. oil and coolant		17:1
D9, incl. fan	kg	825
DC9, incl. fan, radiator and expansion tank	kg	890

Lubrication system

Oil capacity, depending on oil sump	dm^3, min	24
	max	31
Oil consumption	g/kWh	< 0.3
Oil change intervals	h	400
Oil grade		CE or CF acc. to API CCMC D5 Acea E3-96
Oil Pressure		
Normal	bar	3 - 6
Minimum permitted	bar	0.7
Oil temperature		
Maximum permitted	°C	120
Oil cleaner		Cyclone and centrifugal
Filtration	Micron	5 - 7
Oil filter for turbo charger		Paper
Oil cooler		Water cooled/Full flow

Injection system

Type		.Direct injection
Governor		.Mechanical, RSV
Optional		.Electronically controlled mechanical, RSV
Fuel filter		. Paper filter element

Cooling system

Coolant volume, excl. radiator	dm^3	. 18
Coolant temperature	°C	. 75 - 90
Number of thermostats		. 1
Opening temperature	°C	. 79

Intake system

Permissible pressure drop in intake system with cleaned or new filter	mmWc	. 300
Permissible pressure drop in intake system with blocked (dirty) filter	mmWc	. 500

Electrical system, optional equipment

Type		. 1-pole, 24 V, DC
Optional		. 2-pole, 24 V, DC
Starter, standard equipment		. 1-pole, 24 V - 4.0 kW
Optional		. 2-pole, 24 V - 4.0 kW
Alternator, standard equipment		. 1-pole, 28 V - 65 A
Optional		. 2-pole, 28 V - 65 A
		. 1-pole, 28 V - 90 A
Stop solenoid, optional equipment		
Needed power to pull	A	. 39
Needed power to hold	A	.0.46

Latest modification date: 980601 **CID: 10269**

Technical data and cooling equipment recommendation

DC9 50A, order ref 10-26

		1500 r/min	1800 r/min
		LTP	LTP
Gross power	kW	247	272
Specific fuel consumption	g/kWh		
full load		194	199
3/4 load		194	197
1/2 load		198	202
Heat rejection	kW		
to cooling water		93	98
to exhaust gas		170	193
to surrounding air		22	25
Air consumption	kg/min	20	25
Exhaust flow	kg/min	21	26
Exhaust temperature	°C	470	440

		1500 r/min, LTP				1800 r/min, LTP			
		Air-on temp.		Air-on temp.		Air-on temp.		Air-on temp.	
		35 °C	50 °C	35 °C	50 °C	35 °C	50 °C	35 °C	50 °C
Radiator									
front area	m^2	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
weight	kg	47	47	47	47	47	47	47	47
Coolant pump flow	dm^3/min	245	245	245	245	285	285	285	285
Coolant pressure	bar	2,5*)	2,5*)	2,5*)	2,5*)	2,5*)	2,5*)	2,5*)	2,5*)
Fan									
type		Puller	Puller	Pusher	Pusher	Puller	Puller	Pusher	Pusher
Ø	mm	711	711	711	711	711	711	711	711
power losses	kW	5	5	5	5	8	8	8	8
speed ratio		1:1.08	1:1.08	1:1.08	1:1.08	1:1.08	1:1.08	1:1.08	1:1.08
Air flow									
free air flow	m^3/s	5.2	5.2	4.4	4.4	6.5	6.5	5.5	5.5
pressure reserve	mm Wc	19	16	15	12	19	16	15	12

*) All connected components, e.g. cab heaters and converter coolers, must be designed to withstand coolant pressure up to 4 bar.

Latest modification date: 980601

CID: 10020

Basic dimensions

D9

Function of xyz-coordinates is found in "Equipment data".

1. Fuel inlet, for steel pipe Ø12x1

x	- ~ 950
y	- ~250
z	+ ~ 50

2. Fuel return, for steel pipe Ø12x1

x	- ~ 970
y	- ~250
z	+ ~ 30

3. Stop lever *
4. Speed control lever *
5. Air intake, Ø101 *

x	- 218.5
y	+ 307.5
z	+ 348

6. Exhaust outlet *

x	- 438.5
y	+ 307.5
z	+ 348

7. Oil filler cap

x	- 695
y	+ 79
z	+ 644

8. Oil dipstick *
9. Oil drain plug *
10. Coolant inlet, Ø57

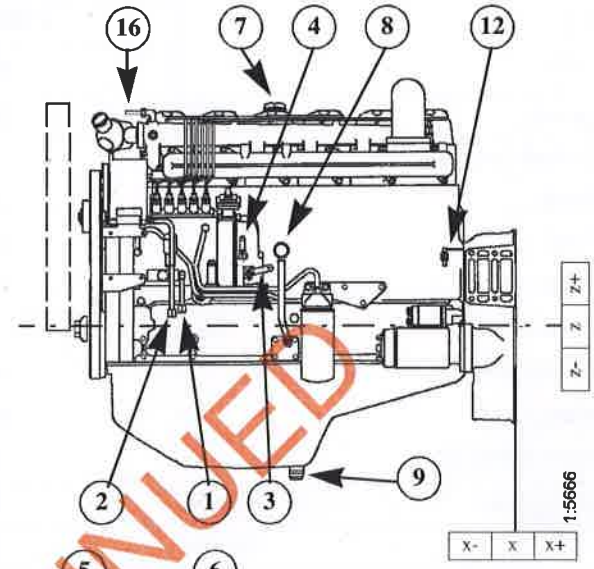
x	- 1150.5
y	- 288
z	- ~ 100

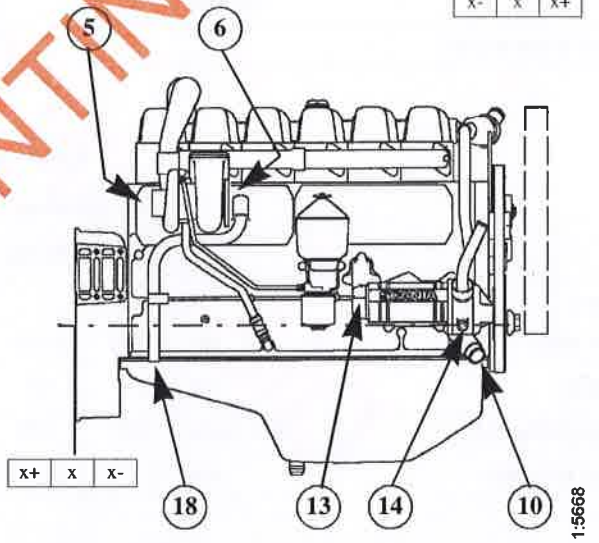
11. Coolant outlet, Ø45

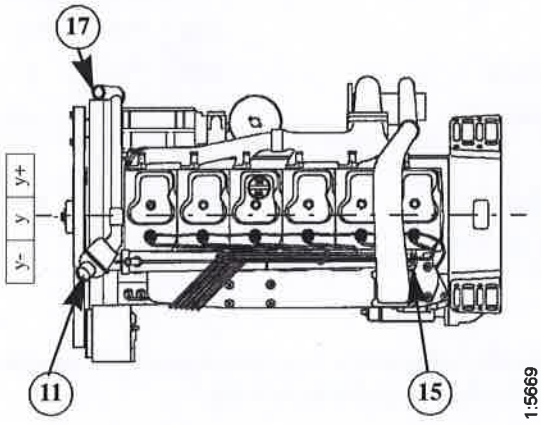
x	- 1203.5
y	- ~140
z	- ~ 610

12. Coolant drain tap
13. Connection for electrical engine heater
14. Outlet from cab heater, M18x1.5
15. Inlet to cab heater, M26x1.5
16. Venting to expansion tank
17. Connection for expansion tank
18. Crankcase ventilation

*Further information in "Equipment data".





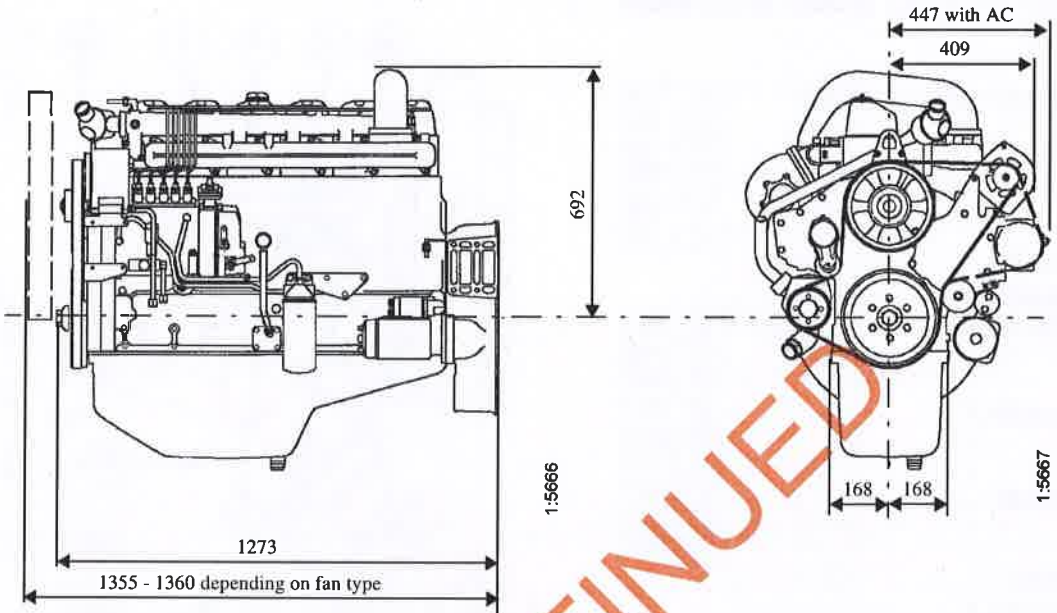


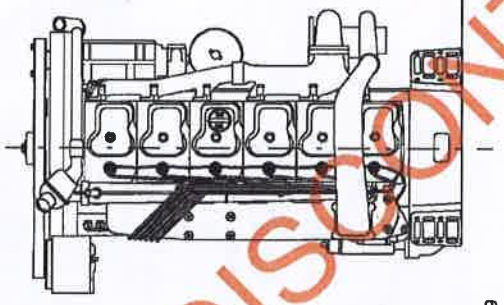
CID: 10021

Latest modification date: 011219

Dimensional drawing

D9

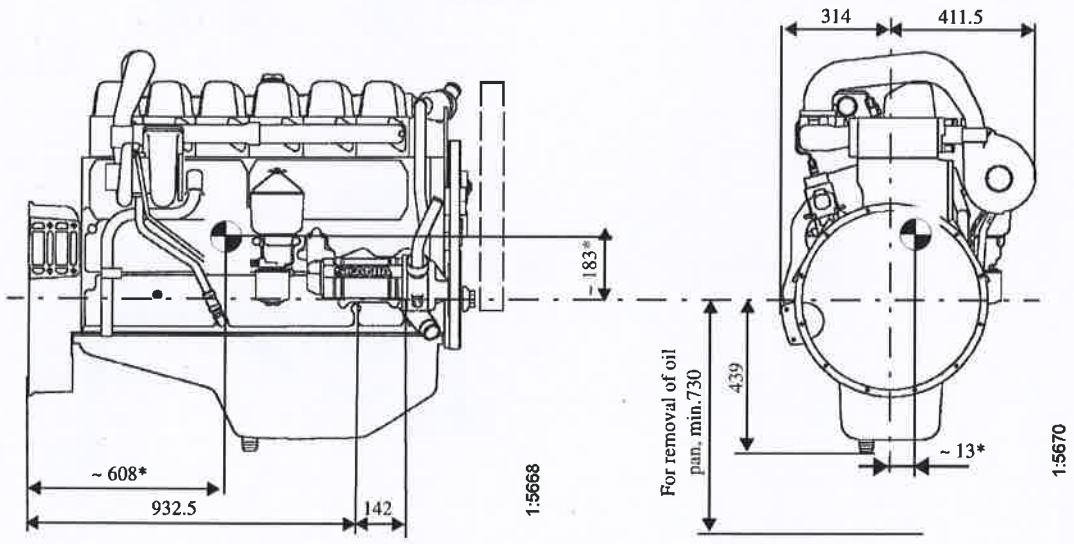




Drawing No. 1 380 626

This sketch is intended only as general sales information and must not be used for any installation purposes. See also "General"

* The values for center of gravity applies for engines with standard equipment including coolant.
Cooling equipment such as fan, fanring and protective grating are not included.



Latest modification date: 980601 **CID: 10022**

Basic dimensions

DC9

Function of xyz-coordinates is found in "Equipment data".

1. Fuel inlet, for steel pipe Ø12x1

x	- ~ 950
y	- ~ 250
z	+ ~ 50

2. Fuel return, for steel pipe Ø12x1

x	- ~ 970
y	- ~ 250
z	+ ~ 30

3. Stop lever *
4. Speed control lever *
5. Air intake, Ø101 *

x	- 228
y	+ 307.5
z	+ 352

6. Exhaust outlet *

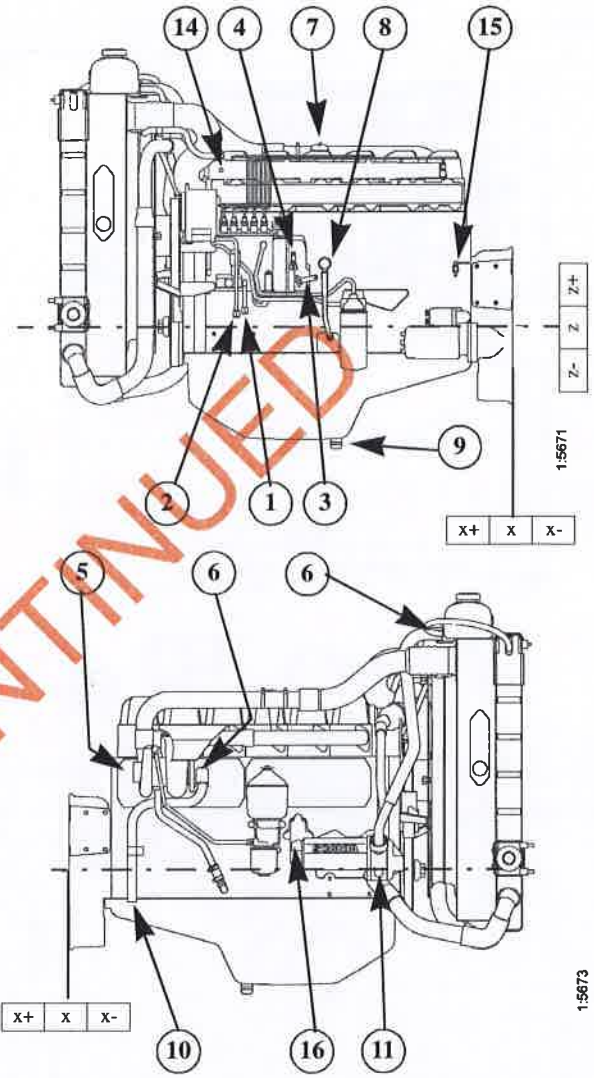
x	- 445
y	+ 307.5
z	+ 352

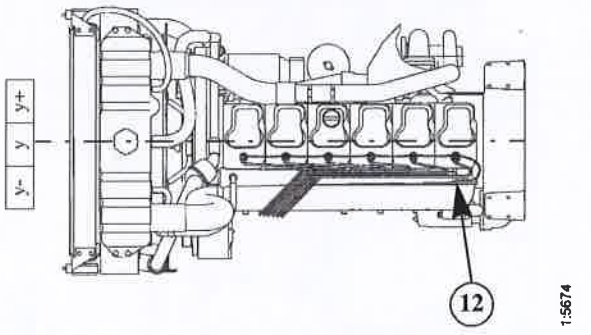
7. Oil filler cap

x	- 695
y	+ 79
z	+ 644

8. Oil dipstick *
9. Oil drain plug *
10. Crankcase ventilation
11. Outlet from cab heater, M18x1.5
12. Inlet to cab heater, M26x1.5
13. Connection for level monitor
14. Connection for coolant temperature sensor/monitor, M14x1.5
15. Coolant drain tap
16. Connection for electrical engine heater

*Further information in "Equipment data".



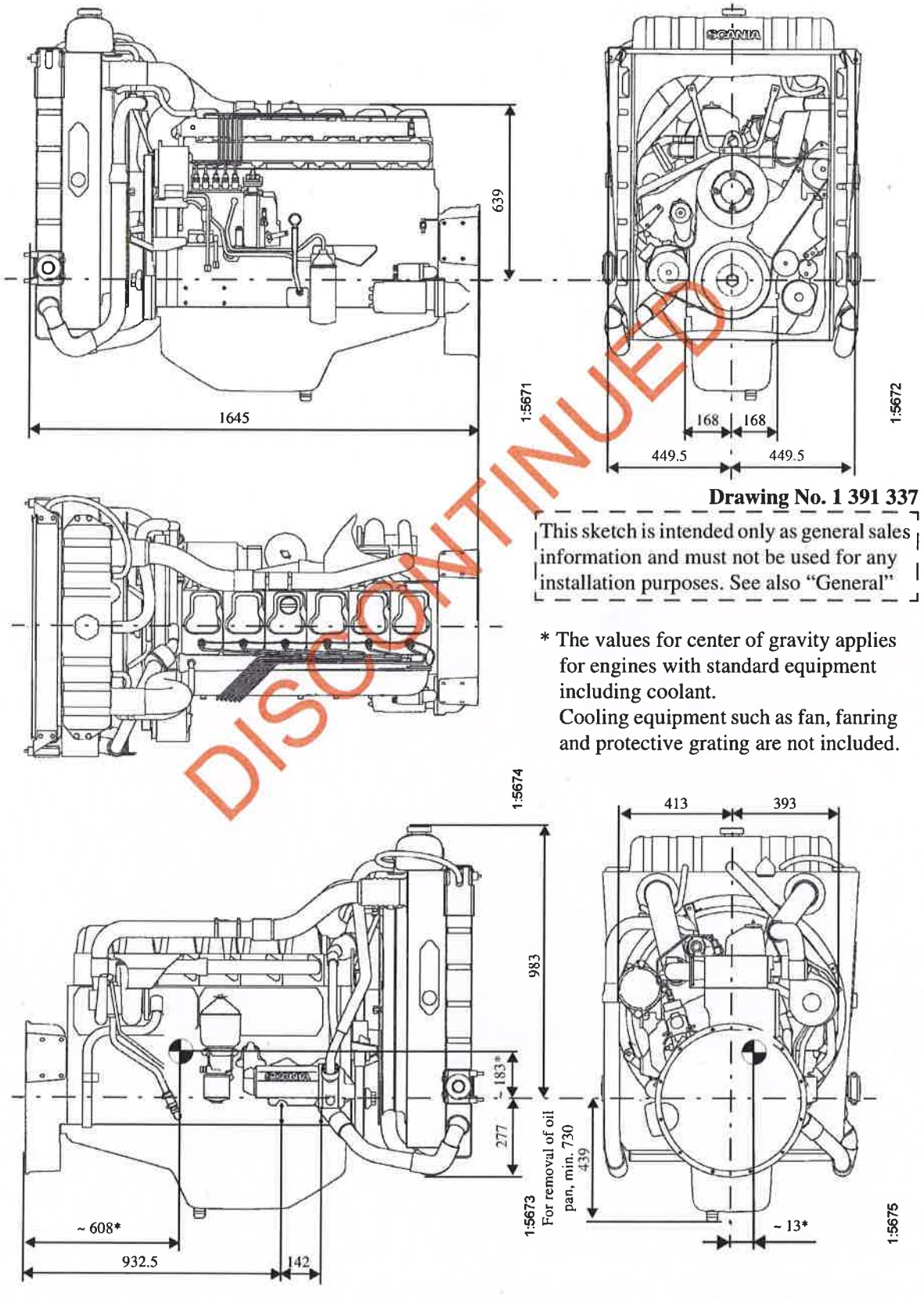


CID: 10023

Latest modification date: 980601

Dimensional drawing

DC9



Drawing No. 1 391 337

This sketch is intended only as general sales information and must not be used for any installation purposes. See also "General"

* The values for center of gravity applies for engines with standard equipment including coolant.
Cooling equipment such as fan, fanring and protective grating are not included.