NEF45TE2P.S550 G-DRIVE ROHS2

Brochure main description		@1500rpm	@1800rpm
Application & simbol		Power Generation	
Engine identication main		N45	
Engine identication rating	kW	100	125
Engine features		PG G-Drive	
Emission feature		RoHS2 Directive 2011/65/EU	

Main characteristics		@1500rpm	@1800rpm
Emission certification		RoHS2 Directive 2011/65/EU	
Commercial code (for order)		N45TE2P.S550	
Other Commercial code		-	
Technical code (original plant engine code, on engine block)		F4HE0485B*J102	
Technical homologation code		F4HE0485B*J	
Stand-by power (gross) [mech]	kW	100	125
Specific power	kW/l	22,2	27,8
Electric commercial power (estimation alternator power output)	kWe [kVA]	88,6	110
BMEP	bar	17,8	18,5
Oil consumption on mission (average)	% fuel comsumption	0,3	
Cycle		diesel 4 stroke	
Air charging system pattern		Turbocharged aftercooled	
Number of cylinder		4	
Configuration (cylinder arrangement)		in line	
Bore	mm	104	
Stroke	mm	132	
Stroke / Bore		1,27	
Displacement	l	4,5	
Unit Displacement	l	1,12	
Bore pitch	mm		
Valves per cylinder		4	
Cooling system type		liquid	
Direction of rotation (looking flywheel)		anti-clockwise	
Compression ratio		17,5 : 1	
Firing order		1 - 3 - 4 - 2	
Injection type		direct - electronic common rail	
Engine brake configuration		-	
Be10		8000 h	
Cylinder Head			
Single / Multiple		single	
Material		cast iron	
Head air circulation		crossflow	
Intake valve dia.	mm	33	
Exhaust valve dia.	mm	33	
Camshaft			
Layout		OHV	
Cam carrier		on inlet valve	
Material and Heat treatment		chilled cast iron	
Valve train		mechanical tappet & push rod	

Main characteristics		@1500rpm	@1800rpm
Drivetrain (timing system)		gear tappet	
Valve actuation		tappet & push rod	
Variable valve actuation system		no	
Cylinder block (crankcase)		No Structural	
Material of cylinder block		cast iron	
Type of liners		block liners	
Liners replaceable; (slip fit or interference fit)		no	
Bearing caps		machined cast iron	
Crankcase Ventilation		Closed	
Oil separator		coalescent filter	
Crankshaft & counterweights			
Material		forged Steel	
Acceptable Inertia (clutch)	kgm^2	0,71	
Balancing		no	
Turbocharger & EGR system			
Turbocharger type		fixed geometry with wastegate valve	
Turbocharger supplier		Garrett	
Turbocharger control		WG pneumatic control	
Pressure after turbocharger compressor	mbar	2000	
Max turbine inlet temperature	°C	760	
Temperature after turbocharger compressor	°C		
Method of cooling the turbocharger		oil lubricated	
Turbo protection devices		-	
EGR type		internal	
EGR control strategy		-	
EGR recirculation rate		-	
Valve		-	
Cooler		-	
Control		-	
Air mass measurement		-	
Exhaust flap			
Exhaust flap supplier		-	
Actuation type		-	
Exhaust flap cooling		-	
Switchability (1500-1800 rpm)			
Emission level 1500 rpm		Stage IIIA	
Emission level 1800 rpm		Tier 3	
Front power take off			
PTO type		-	
Max torque available from front of crankshaft (no side load)	Nm	-	
Power take off on gear train			
SAE A 9 teeth	Nm	-	
SAE A 11 teeth	Nm	-	
SAE B 13 teeth	Nm	-	
SAE B (DIN 5482)	Nm	-	
SAE 2B 15 teeth(ANSI B92,1)	Nm	-	
References values			
Engine dimension LxWxH (indicative values)	mm	833 x 675 x 939	

NEF45TE2P.S550 G-DRIVE ROHS2

Main characteristics		@1500rpm	@1800rpm
G-Drive Dimension LxWxH (indicative values)	mm	1302 x 780 x 1112	
Max permissible engine inclination	deg	25 (Longitudinal) / 28 (Transversal)	
Engine Weight - Dry (no fluids, value purely indicative)	kg	430	
Engine Weight - Wet (with fluids, value purely indicative)	kg	450	
G-Drive Weight - Dry (no fluids, value purely indicative)	kg	500	
G-Drive Weight - Wet (with fluids, value purely indicative)	kg	520	
Center of gravity (FFOB or RFOB according to picture, standard engine layout)	mm	-0,6; 145; -308	
Principal moment of inertia (reference on center of gravity ,standard engine layout)	kgm^2	N/A	
Principal moment of inertia (reference matrix based on center of gravity,standard engine layout)	kgm^2	N/A	
Center of gravity (FFOB or RFOB according to picture, standard IPU/G-Drive layout)	mm	N/A	
Principal moment of inertia (reference on center of gravity ,standard IPU/G-Drive layout)	kgm^2	N/A	
Principal moment of inertia (reference matrix based on center of gravity,standard IPU/G-Drive layout)	kgm^2	N/A	
Mass moment of inertia - rotating components (excluding flywheel)	kgm^2	0,14	
Mass moment of inertia - standard flywheel	kgm^2	0,708	
Bending moment on the flywheel housing	Nm	N/A	
Flywheel housing SAE sizing			
Flywheel SAE sizing			
Bending moment on PTO	Nm	-	
Max static mounting surface load	N	N/A	
Crankshaft thrust bearing pressure limit			
Intermittent load:	MPa	-	
Continuous load:	MPa	15	
Rear main bearing load	MPa	-	
Max bending moment available from front of the crankshaft:			
0 deg	Nm	80	
90 deg	Nm	220	
180 deg	Nm	220	
Environmental operating conditions			
Max altitude for declared performances	m	1000	
Max ambient temperaturefor declared performances	°C	40	
Min guaranteed temperature for cold start w/o any aid (stand alone engine)	°C	- 15	
Min guaranteed temperature for cold start with grid heater (stand alone engine)	°C	- 25	
Min guaranteed temperature for cold start with grid heater and block heater (stand alone engine)	°C	- 30	
Time preheating for manifold heater	s	-3 °C = 0 ; -30 °C = 21	
Time post heating for manifold heater	s	-3 °C = 0 ; -20 °C = 200	
Low idle continuous operation time (reccomended)	h	3	
Engine performance			
Continuous power (gross) [mech]	kW	73	91
Prime power (gross) [mech]	kW	91	114
Stand-by power (gross) [mech]	kW	100	125

NEF45TE2P.S550 G-DRIVE ROHS2

Main characteristics		@1500rpm	@1800rpm
Fan consumption [mech]	kW	1,6	2,8
Continuous power (net) [mech]	kW	71,4	88,2
Prime power (net) [mech]	kW	89,4	111,2
Stand-by power (net) [mech]	kW	98,4	122,2
Typical generator output		88,6	110
Generator available power @ Prime power	kW	80	100
Generator available power @ Stand by	kW	89	110
Power limitation according to ambient conditions			
Ambient temperature above xx°C	%/5°C (xx°C)	2	
Altitude > 1000 < 3000m above sea level	%/500m	3	
Altitude > 3000m above sea level	%/500m	6	
Power limitation due to safety protections			
Max water temperature (Switch on of the MIL lamp)	°C	106	
Start derating: switch on of the warning coolant temperature lamp (amber color)	°C	109	
Max derating (50% derating) switch on of the high coolant temperature lamp (redcolor)	°C	112	
Altitude level: gradual reduction of transient response by smoke map correction from	m	2000	
Fuel temperature	°C	70	
Intake manifold air temperature	°C	50	
ATS Max gas inlet temperature	°C	-	
Max allowed exhaust temperature	°C	740 °C - 760 (peak)	
Turbine overheating protection	°C	760	
Turbine overspeed protection	rpm	140000	
Oil temperature protection	°C	125	
Oil pressure protection (min engine rpm)	bar	5	

Fuel System		
Fuel density	kg/l	0,835
Injection system type		electronic common rail
Injection pump manufacturer		Bosch
Injection model type		High Pressure Pump
Injection model pump		Bosch CP3.3
Injection pressure	bar	1600
Injector		Bosch CRIN2
Injector installation (sleeve, sealing flat or conical)		sleeve
Injector nozzle		8 x 400
Engine fuel compatibility		see GOLD Documentation on fluids
Feed pump on engine		integrated in high pressure pump
Max fuel flow supply line	l/h	280
Nominal feed pressure	bar	0,5 - 1
Fuel filter		multilayer stratapore
Fuel filter clogging sensor	bar	0,09
Max continuous allowable fuel temperature (without derating)	°C	70
Max relative pressure at gear pump inlet	bar	0
Min relative pressure at gear pump inlet	bar	- 0,5
Max back flow relative pressure	bar	0,2
Max back flow restriction	bar	0,2
Max heat rejection to return fuel	kW	0,65

Fuel System		
Max fuel flow return line	kg/h	27,3
Min fuel tank venting requirement	m^3/h	0,4
Prefilter / Water separator micron size	µm	20 - 40

Air Intake System		@1500rpm	@1800rpm
Aftercooling system type		air to air	
Interstage cooling type		-	
RoA (Temperature raise between ambient and inlet to engine	°C	25	
Filter air intake temperature (warm air ricirculatuion)	°C	≤ 5	
Max intake manifold temperature	°C	50	
Compressor inlet pressure (with new air filter)	hPa	≥ - 45	
Compressor inlet pressure (with dirty air filter)	hPa	≥ - 65	
Air filter type		dry	
Loads on turbocharger on compressor intake	kg	0	
Loads on turbocharger on compressor outlet	kg	0	
Charge air flow (max)	kg/h	501	571

Exhaust System		
Max back pressure (after exhaust flap) @ rated power with clean system	hPa	180
Max mechanical load on turbine flange	kg	0
Max ambient temperature for exhaust flap actuator	°C	-
Max exhaust temperature After Treatment System	°C	-
Max exhaust flow rate	kg/h	@1500rpm: 522 kg/h; @1800rpm: 583
Energy to exhaust	kW	628

After Treatment System	
After Treatment System	-
POC	-
DPF	-
DOC	-
SCR	-
Urea Dosing System	-
AdBlue mixer	-
ATS sensors	-
DPF regeneration strategy	-

Lubrication System		
Oil sump capacity	l	11,3 (stationary engine) / 9,8 (functioning engine)
Oil sump capacity, max level	l	11,3 (stationary engine) / 9,8 (functioning engine)
Oil sump capacity, min level	l	8,3 (stationary engine) / 6,8 (functioning engine)
Oil system capacity including filter	l	14,4
Oil pump type		gear pump
Oil pump drive arrangement		driven by gear
Min oil pump flow	l/min	12
Max oil pump flow (@rated speed)	l/min	50
Min oil pressure @ low idle (engine oil temp at 120°C)	kPa (bar)	60 (0,6)
Min oil pressure @ rated speed (engine oil temp at 120°C)	kPa (bar)	250 (2,5)

Lubrication System		
Max oil pressure @ rated speed (engine oil temp at 120°C)	kPa (bar)	500 (5)
Max oil temperature @ full load (in main gallery)	°C	< 120
Max oil pressure peak on cold engine	bar	15
Oil cooler type		water cooled
Transducer for indicating oil temperature and pressure		signal from ECU
Max engine angularity - longitudinal / transversal (std oil pan)	deg	25 longitudinal / 28 transversal
Allowed engine gradability during installation on vehicle	deg	0
Oil servicing intervals	h	see dedicated GOLDBook document on fluids
Oil filter type		cartridge
Oil filter capacity	l	1
Max oil content admitted in blow by gas (after filter)	g/h	0,3
Oil for cold condition mission (T° ambient < -25°C)		see dedicated GOLD Book document on fluids

Cooling system		@1500rpm	@1800rpm
Type (water to water or air to water)		air to water	
Recommended coolant		see dedicated GOLDBook document on fluids	
Min radiator cap pressure	kPa	70	
Warnnig setting first threshold	°C	103	
Max additional restriction (cooling system)	Pa	0,196	
Air to boil (prime power, open genset configuration). For further information see GB document	°C	60	
Air to boil (stand by, open genset configuration). For further information see GB document	°C	N/A	
EGR Cooler water flow (for ΔT=6°C)	l/s	-	
LP-CAC water flow (for ΔT=6°C)	l/s	-	
Fan			
Diameter	mm	500	
Number of blades		10	
Drive ratio		1,41:1	
Speed		2115 rpm (1500 rpm) - 2538 rpm (1800 rpm)	
Air flow		1,6 m3/s (1500 rpm) - 2 m3/s (1800 rpm)	
Power consumption		1,6 kW (1500 rpm) - 2,8 kW (1800 rpm)	
Radiator			
Core dimensions LxWxh	mm	341 x 783 x 1105	
Dry weight	kg	47	
Radiator coolant capacity	l	7	
Optimum coolant temperature range @engine out (50% glycol)	°C	83 ÷ 99	
Engine Water pump Type		centrifugal pump	
Engine water pump drive		driven by belt	
Coolant capacity (engine only)	l	7	
Coolant capacity (radiator & hoses)	l	10	
Thermostat type		wax type	
Thermostat position		on cylinder head	
Thermostat opening / fully open temperature	°C	(76 - 80) / 95	
Recommended coolant circuit pressurization range (relative)	hPa	1,5 (max 3)	
Coolant engine pressure outlet – inlet (delta pressure, open thermostat, high idle conditions)	hPa	< 0,2	

Cooling system		@1500rpm	@1800rpm
Coolant engine pressure outlet – inlet (only with remote thermostat, ex. retarder)	hPa	-	
Min coolant pressure (no pressure cap and thermostat closed)	hPa	1	
Coolant water pump inlet pressure (water temperature 60-100°C)	hPa	0,5	
Coolant flow to radiator @rated speed	l/h	-	
Min coolant expansion space (% total cooling system capacity)	%	-	
Max coolant flow to accessories @ rated speed from cab heater	l/min	-	
Engine out coolant to ambient @rated speed	delta °C	-	
Engine out coolant to ambient @torque speed	delta °C	-	
Charge air cooler outlet to ambient @max rpm - CAC dT	delta °C	-	
Pump water flow	l/min	123	147

Electrical, Electronic and Control Systems		
System voltage	V	12 - 24
Engine control unit		MD1CE101
ECU software		P1603v454r28
ECU Vehicle connection		via body computer with CAN line
ECU operating range	°C	- 40 ÷ + 85
Temperature of ECU case for <5' after power up	°C	85
ECU rated continuous temperature	°C	80
ECU communication protocol		SAE J1939 for engine control, ISO14229 (UDS) for engine diagnosis
Min power supply for ECU operation	V	9
Max power supply for ECU operation	V	32
Battery wire connection resistance value @20°C (from battery to ECU)	mΩ	RT30 = 3,1 – 7,5 mΩ (+20°C; PE=0%) ; RT50 < 80
Diagnostic connector type		on board
Min cranking speed TDC @-30°C	rpm	90
Average cranking speed	rpm	130
N° tooth pinion/crown gear		10/125
Min battery voltage	V	(12V a vuoto) 11
Mean battery voltage	V	(12 V a vuoto) 11
Min battery current	Ah	min 55, 420 CCA (or 50342)
Mean battery current	Ah	max 176, 1320 CCA (or 50342)
Max starting circuit resistance (to starter)	mΩ	RT30 = 3,1 – 7,5 mΩ (+20°C; PE=0%) ; RT50 < 80

Cold starting		
Without air preheating	°C	-10
With air preheating (if available)	°C	-25

Emission gaseus and particulales		
NOx (Oxides of nitrogen) [NRSC]	g/kWh	3,071
HC (Hydrocarbons) [NRSC]	g/kWh	0,17
NOX+HC [NRSC]	g/kWh	3,78
CO (Carbon monoxide) [NRSC]	g/kWh	0,89
PM (Particlutes) [NRSC]	g/kWh	0,165
CO2 (Carbon Dioxide) [NRSC]	g/kWh	-
NOx (Oxides of nitrogen) [NRTC]	g/kWh	

Emission gaseus and particulales		
HC (Hydrocarbons) [NRTC]	g/kWh	
NOX+HC [NRTC]	g/kWh	
CO (Carbon monoxide) [NRTC]	g/kWh	
PM (Particlutes) [NRTC]	g/kWh	
CO2 (Carbon Dioxide) [NRTC]	g/kWh	

Maintenance	
Oil drain interval	see dedicated GOLD Book document
Oil filter change	see dedicated GOLD Book document
Oil refilling time	daily check to evaluate oil refill necessity
Approved engine oil specifications	
CCV filter change	see dedicated GOLD Book document
Fuel filter change	see dedicated GOLD Book document
Fuel pre-filter change	see dedicated GOLD Book document
Belt replacement	1200 h
Valve lash check /adjustment	3000 h
AdBlue filter Change	-
DPF filter service	-
Coolant change	see dedicated GOLD Book document

Engine Noise		
Overall sound pressure (engine only)	dBA	N/A
Overall sound pressure (with accessories only)	dBA	N/A
Exhaust noise (w/o Muffler)	dBA	N/A
Noise spectrum (octave analysis performed at the position of maximum noise) - diagram	Table dB-Hz	-

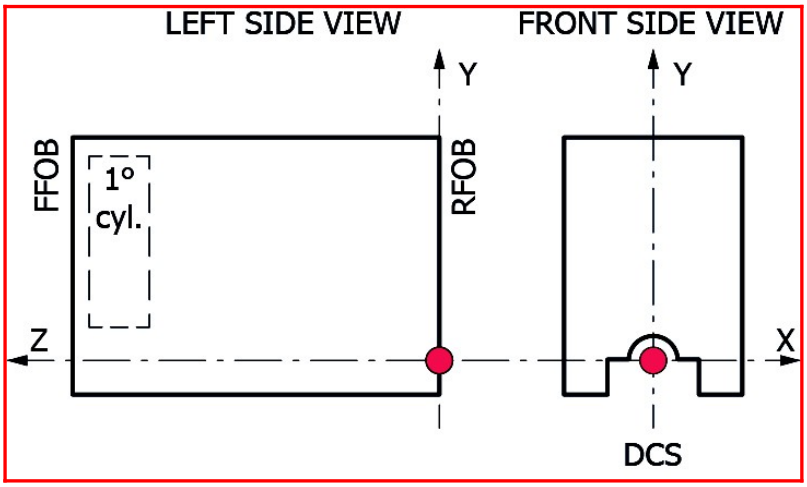
Step Load (for further information see GB document)		@1500rpm	@1800rpm
G1 (% of PrP)	%	-	92
G2 (% of PrP)	%	-	-
G3 (% of PrP)	%	73	69
G1 (% of PrP) [open flap]	%	-	-
G2 (% of PrP)[open flap]	%	-	-
G3 (% of PrP)[open flap]	%	-	-
G1 (% of PrP) [closed flap]	%	-	-
G2 (% of PrP) [closed flap]	%	-	-
G3 (% of PrP) [closed flap]	%	-	-
Removal load (G1)	%	-	-
Removal load (G2)	%	-	-
Removal load (G3)	%	100	100
Emergency (xxx)	%	-	-
Emergency (xxx)	%	-	-
Emergency (xxx)	%	-	-

Maximum Rating Performance Data		@1500rpm	@1800rpm
Torque	Nm	636	663
Ambient Temperature	°C	23	23
EGR Rate	%	-	-
Fuel Flow	g/s	5,9	6,1

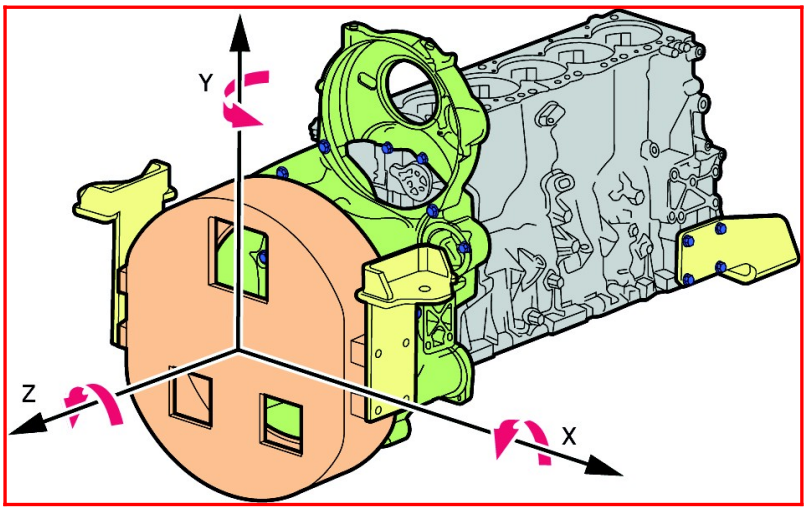
Maximum Rating Performance Data		@1500rpm	@1800rpm
Fuel consumption (BSFC) (prime power)	(kg/h) [g/kWh]	(20) [221]	(24,4) [213,4]
Fuel consumption (BSFC) (stand by)	(kg/h) [g/kWh]	(21.4) [222]	(27,3) [213]
Fuel consumption (BSFC) (80% prime power)	(kg/h) [g/kWh]	(16,1) [219,8]	(20,1) [222]
Fuel consumption (BSFC) (50% prime power)	(kg/h) [g/kWh]	(10,7) [237,2]	(14,7) [242,4]
Fuel consumption (BSFC) (25% prime power)	(kg/h) [g/kWh]	-	-
AdBlue consumption (average on mission)	% of fuel cons	-	-
AdBlue consumption (prime power)	% of fuel cons	-	-
AdBlue consumption (stand by)	% of fuel cons	-	-
AdBlue consumption (80% prime power)	% of fuel cons	-	-
AdBlue consumption (50% prime power)	% of fuel cons	-	-
AdBlue consumption (25% prime power)	% of fuel cons	-	-
Exhaust Gas Flow	kg/h	145	160

Design air handling system data		@1500rpm	@1800rpm
EGR flow	kg/h	-	-
EGR pressure	kPa	-	-
Boost pressure (compressor outlet)	kPa	162	167
Pressure drop on charge air cooling system	kPa	-	-
Max temperature after HP-Compressor	°C	-	-
Boost temperature (includes EGR effect)	°C	-	-
ATS back pressure	kPa	-	-
Exhaust Gas Temp between HP-TC	°C	-	-
Max Exhaust Gas Temp (after TC)	°C	511	560
Max admitted back pressure after SCR	kPa	-	-
Max admitted back pressure after TC	kPa	-	-
Power engine coolant without EGR & CAC (prime power)	kW [kcal/kWh]	-	-
Power engine coolant without EGR & CAC (stand by)	kW [kcal/kWh]	-	-
Power high Temperature EGR Cooler (engine water) (prime power)	kW [kcal/kWh]	-	-
Power high Temperature EGR Cooler (engine water) (stand by)	kW [kcal/kWh]	-	-
Power to coolant due to EGR LP-Circuit (prime power)	kW [kcal/kWh]	-	-
Power to coolant due to EGR LP-Circuit (stand by)	kW [kcal/kWh]	-	-
Total Power to coolant (prime power)	kW [kcal/kWh]	54	66,7
Total Power to coolant (stand by)	kW [kcal/kWh]	59,9	74,1
Total pump water flow	l/s	2,1	2,5
Radiator Coolant Flow (5% less if continuous deareating system, coolant according to FPT norms)	l/min	-	-
EGR Cooler water flow (for ΔT=6°C)	l/s	-	-
LP-CAC water flow (for ΔT=6°C)	l/s	-	-
Power in CAC (air to air) (prime power)	kW [kcal/kWh]	13,2	14,2
Power in CAC (air to air) (stand by power)	kW [kcal/kWh]	14,6	16,9
Power Radiated	kW	5,1	6,5

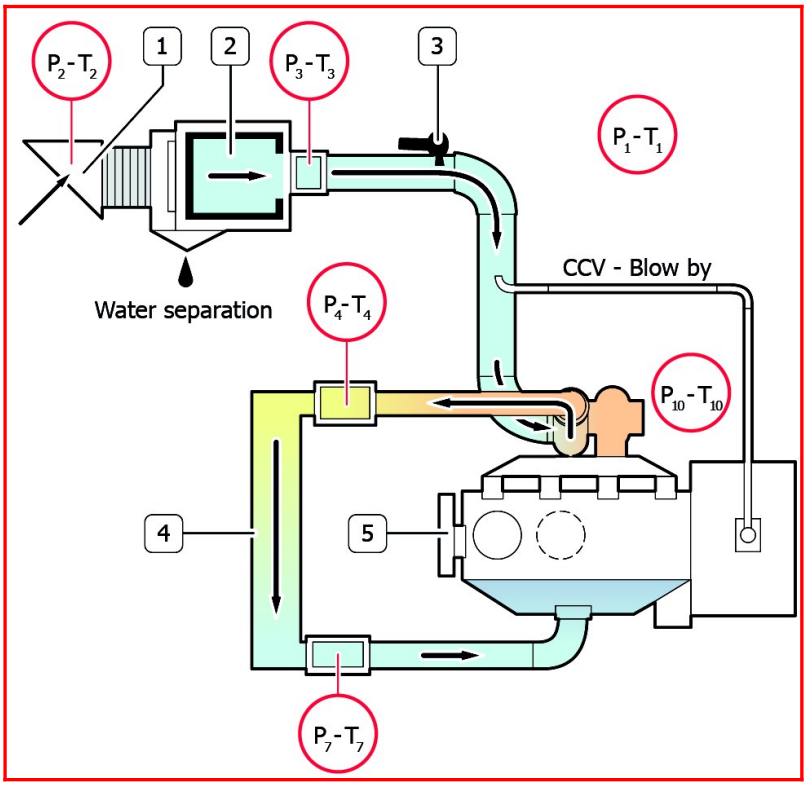
Images



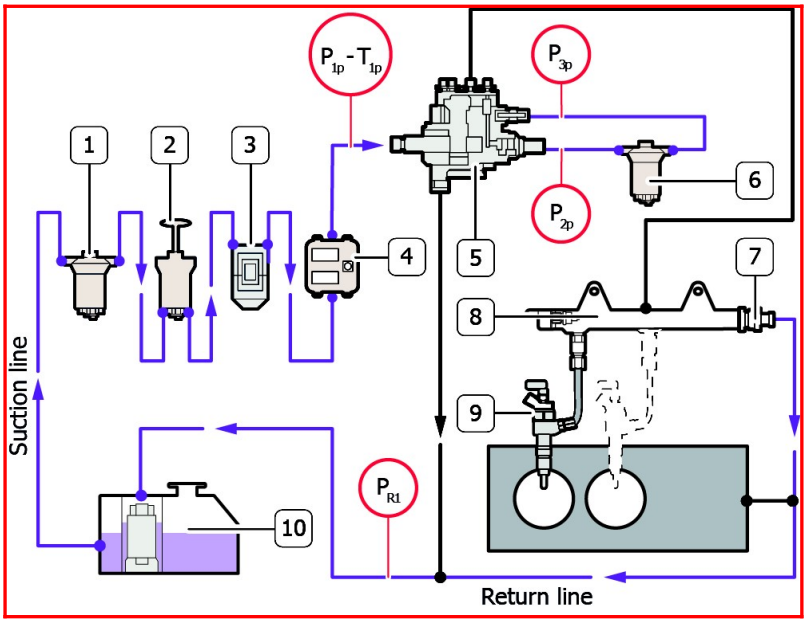
Principal Moment of Inertia



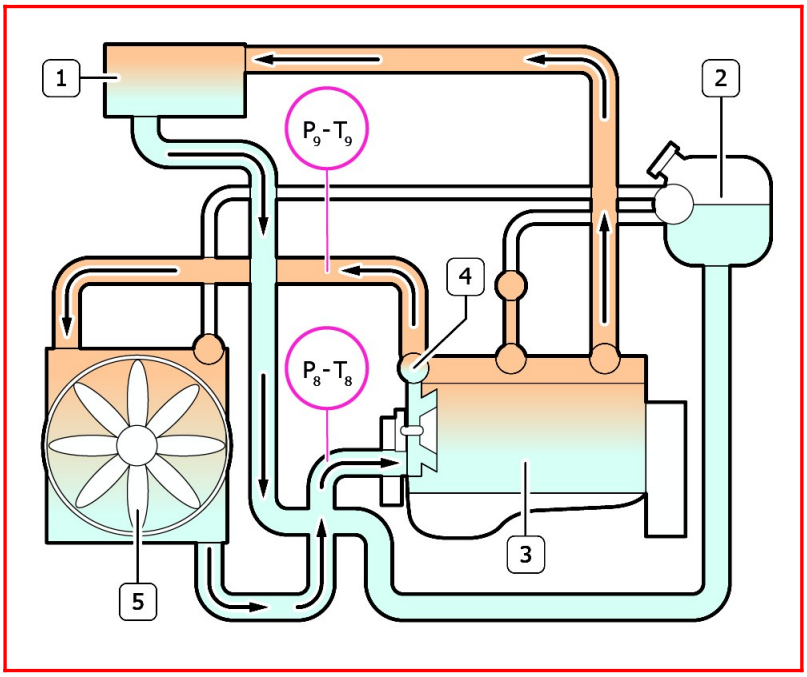
Components



1.Snorkel 2.Air Filter 3.Humidity sensor 4.Intercooler



1.Inspection glass with strainer 2.Prime pump 3.Pre-filter with water separator 4.ECU 5.High Pressure pump 6.Fuel Filter 7.Overpressure valve 8.Common Rail 9.Injectors 10.Fuel tank



1.Heating element 2.Expansion tank 3.Engine 4.Thermostat 5.Radiator

ACRONYMS LIST

Acronyms	Description
-	Not Needed
2stTC	Two Stage Turbo (sequential)
Ag	Agricultural
ASC	Ammonia Slip Catalyst (same as CUC)
ATS	After Treatment System
BSFC	Brake Specific Fuel Consumption
CAC	Charge Air Cooler
CCDPF	Close Coupled DPF
CCV	Crankcase Ventilation
CE	Construction Equipment
CI	Cast Iron
CRS	Common Rail System
CRSN	Common Rail System NKW (Commercial vehicles)
CUC	Clean Up Catalyst for ammonia (same as ASC)
DAVNT	Dual Axis Variable Nozzle Turbine
DCS	Drawing Coordinate System
DI	Direct Injection
DOC	Diesel Oxidation Catalyst
DOHC	Double Over Head Camshaft
DPF	Diesel Particulate Filter
ECEGR	External Cooled EGR
ECU	Engine Control Unit
EEGR	External EGR
EGR	Exhaust Gas Recirculation
epWG	Electro pneumatic WG
eVGT	Electrical VGT
eWG	Electrical WG
FFOB	Front Face of Block
FGT	Fixed Geometry Turbocharger (no WG)
FIE	Fuel Injection System
HD	Heavy Duty
HLA	Hydraulic Lash Adjusters
IDI	Indirect Injection

Acronyms	Description
iEGR	Internal EGR
IPU	Industrial Power Unit
ISC	Interstage Cooling
LD	Light Duty
LDCV	Light Duty Commercial Vehicles
LH	Left Hand Side
LWR	Laser Welded Rail
MD	Medium Duty
n/a	Not Available
NA	Natural Aspirated
NS	Non Structural
OHV	Over Head Valves
OPT	Option
PCP	Peak Cylinder Pressure
PTO	Power Take Off
RFOB	Rear Face of Block
RH	Right Hand Side
S	Structural
SAPS	Sulphated Ash, Phosphorus, Sulphur
SCR	Selective Catalytic Reduction catalyst
SCRoF	SCRon filter
SOHC	Single Over Head Camshaft
STD	Standard
TC	Turbocharged
TCA	Turbocharged, Charge Air Cooled
THM	Thermal Management
UFDPF	Under Floor DPF
UQS	Urea Quality Sensor
VE	Bosch Distributor Mechanical Pump
VFT	Variable Flow Turbine
VGT	Variable Geometry Turbocharger
WG	Waste Gate Turbocharger
XPI	Extra high Pressure Injection (Scania, Cummins)

Unit of misure according to international system of unit. Engine accessories and Options available on Option List. All data is subject to change without notice.

UPDATING

Revision	Description	Date
Revision 2.1_Jul 2021		July/2021
Revision 3.0_Mar 2022		March/2022