



N67TEVP05.00 G-DRIVE STAGE V



Brochure main description @1500rpm @1800rpm

Application & simbol		Power Generation	
Engine identification main		N67	
Engine identification rating	kW	200	230
Engine features		PG G-Drive	
Emission feature		Stage V	

Main characteristics @1500rpm @1800rpm

Emission certification		Stage V	
Commercial code (for order)		N67TEVP05.00	
Technical code (Pregnana productions, if needed)		-	
Technical code (original plant engine code, on engine block)		F4HGE615D*V001	
Technical code family (original plant engine code)		F4HGE615D*V	
Stand-by power (gross) [mech]	kW	200	230
Specific power	kW/l	29,8	34,3
Electric commercial power (estimation alternator power output)	kWe [kVA]	[184]	[209,6]
BMEP	bar	N/A	N/A
Oil consumption on mission (average)	% fuel consumption	0,3	
Cycle		Diesel 4 stroke	
Air charging system pattern		Turbocharged aftercooled	
Number of cylinder		6	
Configuration (cylinder arrangement)		in line	
Bore	mm	104	
Stroke	mm	132	
Stroke / Bore		1,27	
Displacement	l	6,7	
Unit Displacement	l	1,12	
Bore pitch	mm	120	
Valves per cylinder		4	
Cooling system pattern		liquid	
Direction of rotation (looking flywheel)		anti-clockwise	
Compression ratio		17 : 1	
Firing order		1 - 5 - 3 - 6 - 2 - 4	
Injection type		Direct - Electronic Common Rail	
Engine brake configuration		-	
Be10		8000	
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		no	
Material and Heat treatment		chilled cast iron	
Valve train		mechanical tappet & push rod	



N67TEVP05.00 G-DRIVE STAGE V



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			dry
Liners replaceable; (slip fit or interference fit)			no
Bearing caps			machined cast iron
Crankcase Ventilation			yes
Oil separator			coalescent filter
Crankshaft & counterweights			
Material			forged steel
Acceptable Inertia (clutch)	kgm ²		0,75
Balancing			no
Turbocharger & EGR system			
Turbocharger type			fix geometry with wastegate valve
Turbocharger supplier			Borgwarner
Turbocharger control			WG pneumatic control
Max boost pressure	mbar		1750
Max turbine inlet temperature	°C		700
Method of cooling the turbocharger			oil lubricated
Turbo protection devices			WG + software strategy
EGR			-
EGR control strategy			-
Rate			-
Valve			-
Cooler			-
Control			-
Air mass measurement			-
Exhaust flap			
Exhaust flap supplier			Pierburg
Actuation type			electronic actuator
Exhaust flap cooling			yes
Switchability (1500-1800 rpm)			
Emission level 1500 rpm			Stage V
Emission level 1800 rpm			T4B (from end 2019)
Front power take off			
PTO type			-
Max torque available from front of crankshaft (no side load)	Nm		400
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		1103 x 764 x 1164
G-Drive Dimension LxWxH (indicative values)	mm		



N67TEVP05.00 G-DRIVE STAGE V



Main characteristics		@1500rpm	@1800rpm
Max permissible engine inclination	deg		25
Engine Weight - Dry (no fluids, value purely indicative)	kg		454
Engine Weight - Wet (with fluids, value purely indicative)	kg		469
G-Drive Weight - Dry (no fluids, value purely indicative)	kg		610
G-Drive Weight - Wet (with fluids, value purely indicative)	kg		N/A
Center of gravity (FFOB or RFOB according to picture, standard engine layout)	mm		N/A
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	X = -20,1 mm, Y = 178,4 mm, Z = -405,4	
Principal moment of inertia (reference on center of gravity ,standard IPU/G-Drive layout)	kgm ²	Ix = 3,33e+07 kgm ² , Iy = 6,49e+07 kgm ² , Iz = 7,94e+07	
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		0,33
Mass moment of inertia - standard flywheel	kgm ²		0,7 - 1,3
Bending moment on the flywheel housing	Nm	Point 1: within safety factor with mass 130 kg @ max Z:380 mm Point 2: within safety factor with mass 55 kg @ max Z:750 mm Point 3: within safety factor with mass 36 kg @ max Z: 1050mm	
Bending moment on PTO	Nm		140
Max static mounting surface load	N		N/A
Crankshaft thrust bearing pressure limit			not available
Intermittent load:	MPa		-
Continuous load:	MPa		15
Rear main bearing load	MPa		-
Max bending moment available from front of the crankshaft:			not available
0 deg	Nm		100
90 deg	Nm		270
180 deg	Nm		270
Environmental operating conditions			
Max altitude for declared performances	m		1500
Max ambient temperature for declared performances	°C	depends from inlet air temperature, max temperature is 45°	
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		- 20
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 s ; - 30°C = 21	
Time post heating for manifold heater	s	- 3°C : 0 s ; - 20°C : 200	
Low idle continuous operation time (reccomended)	h		3
Engine performance		1500 rpm	1800 rpm
Continuous power (gross) [mech]	kW	145	167
Prime power (gross) [mech]	kW	181	209
Stand-by power (gross) [mech]	kW	200	230
Fan consumption [mech]	kW	5	8,5



N67TEVP05.00 G-DRIVE STAGE V



Main characteristics		@1500rpm	@1800rpm
Continuous power (net) [mech]	kW	140	159
Prime power (net) [mech]	kW	176	201
Stand-by power (net) [mech]	kW	195	222
Typical generator output	kW	N/A	N/A
Generator available power @ Prime power	kW	210	238
Generator available power @ Stand by	kW	230	260
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		104
Start derating: switch on of the warning coolant temperature lamp (amber color)	°C		106
Max derating (50% derating) switch on of the high coolant temperature lamp (redcolor)	°C		110
Altitude level: gradual reduction of transient response by smoke map correction from	m		2000
Fuel temperature	°C		70
Intake manifold air temperature	°C		70
ATS Max gas inlet temperature	°C		580
Max allowed exhaust temperature	°C		600
Turbine overheating protection	°C		700
Turbine overspeed protection	rpm		-
Oil temperature protection	°C		125
Oil pressure protection (min engine rpm)	bar		0,5
Fuel System			
Fuel density	kg/l		0,835
Injection system type			common rail
Injection pump manufacturer			Bosch
Injection model type			CRSN2-16
Injection model pump			Bosch CP3.3
Injection pressure	bar		1600
Injector			Bosch CRIN2-16
Injector installation (sleeve, sealing flat or conical)			vertical - no sleeve - flat seal
Injector nozzle			8 x 400
Engine fuel compatibility			see dedicated GOLD Book document on fluids
Feed pump			on engine
Max flow	l/h		280
Nominal feed pressure	bar		0,5 - 1
Fuel filter			single cartridge, left side
Delta pressure on fuel filter	bar		N/A
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
Max fuel flow	kg/h		455



N67TEVP05.00 G-DRIVE STAGE V



Fuel System

Min fuel tank venting requirement	m ³ /h	0,4
Prefilter / Water separator micron size	µm	30

Air Intake System

		@1500rpm	@1800rpm
Aftercooling type (air to air or water to air)			air to air
Interstage cooling type			-
RoA (Temperature raise between ambient and inlet to engine)	°C		≤ 25
Filter air intake temperature (warm air recirculation)	°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			-
Loads on turbocharger on compressor intake	kg		2,5
Loads on turbocharger on compressor outlet	kg		2,5
Charge air flow (max)	kg/h	818	960

Exhaust System

		@1500rpm	@1800rpm
Max back pressure (after exhaust flap) @ rated power with clean system	hPa		0,2
Max mechanical load on turbine flange	kg		0
Max ambient temperature for exhaust flap actuator	°C		105
Max exhaust temperature After Treatment System	°C		550
Max exhaust flow rate	kg/h		996
Energy to exhaust	kW	156,3	179,8

After Treatment System

After Treatment System		DOC + SCRof + CUC
POC		-
DPF		-
DOC		4,6
SCR		10,4 (SCR) + 16,3 (SCRof)
Urea Dosing System		Bosch DNOx
AdBlue mixer		yes
ATS sensors		temperature, delta pressure, humidity, NOx
DPF regeneration strategy		-

Lubrication System

Oil sump capacity	l	16
Max	l	14
Min	l	7
Oil system capacity including filter	l	18
Oil pump type		gear pump
Oil pump drive arrangement		driven by gears
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)	350 (3,5)
Max oil pressure @ rated speed (engine oil temp at 120°C)	kPa (bar)	350 (3,5)



N67TEVP05.00 G-DRIVE STAGE V



Lubrication System

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	< 35° (depends on the oil pan)
Allowed engine gradability during installation on vehicle	deg	+/- 4°
Oil servicing intervals	h	see dedicated GOLD Book document on fluids
Oil filter type		single cartridge, right side
Oil filter capacity	l	1
Max oil content admitted in blow by gas (after filter)	g/h	0,3
Approved engine oil specifications		see dedicated GOLD Book document on fluids
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)			water to water
Recommended coolant		see dedicated GOLD Book document on fluids	
Min radiator cap pressure	kPa		0,7
Warnnig setting first threshold	°C		102
Max additional restriction (cooling system)	Pa		N/A
Air to boil (prime power, open genset configuration)	°C		55
Air to boil (stand by, open genset configuration)	°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	685
Number of blades		12
Drive ratio		1,4
Speed		2115 (@50Hz) / 2538 (@60Hz)
Air flow		3,8 (m3/s) @50Hz / 4,8 (m3/s) @60Hz
Power consumption		4,8 (kWm) @50Hz / 8,3 (kWm) @60Hz

Radiator

Core dimensions LxWxh	mm	758 x 308 x 1163
Dry weight	kg	
Radiator coolant capacity	l	13
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	12,6
Coolant capacity (radiator & hoses)	l	15
Thermostat type		wax type
Thermostat position		on cylinder head
Thermostat opening / fully open temperature	°C	80 ÷ 90
Recommended coolant circuit pressurization range (relative)	hPa	N/A
Coolant engine pressure outlet – inlet (delta pressure, open thermostat, high idle conditions)	hPa	< 0,2
Coolant engine pressure outlet – inlet (only with remote thermostat, ex. retarder)	hPa	-



N67TEVP05.00 G-DRIVE STAGE V



Cooling system		@1500rpm	@1800rpm
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		190
Min coolant expansion space (% total cooling system capacity)	%	Expansion Tank volume (and max level) must consider also coolant thermal expansion to avoid coolant loss in high temperature conditions. This can be checked in ATB Power Test	
Max coolant flow to accessories @ rated speed from cab heater	l/min		1200
Engine out coolant to ambient @rated speed	delta °C		not available
Engine out coolant to ambient @torque speed	delta °C		not available
Charge air cooler outlet to ambient @max rpm - CAC dT	delta °C		25
Coolant engine flow	l/min	154	185

Electrical, Electronic and Control Systems			
System voltage	V	12 - 24	
Engine control unit		MD1	
ECU software		P1603 V45.1	
ECU Vehicle connection		with CAN line	
ECU operating range	°C		
Temperature of ECU case for <5' after power up	°C	+ 85	
ECU rated continuous temperature	°C	+ 80	
ECU communication protocol		SAE J1939 or FPT	
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	≤ 80	
Diagnostic system		on board	
Min cranking speed TDC @-30°C	rpm	75	
Average cranking speed	rpm	115	
N° tooth pinion/crown gear		10 / 125	
Min battery voltage	V	9(12V System) - 16(24V System)	
Mean battery voltage	V	11(12V System) - 18,4(24V System)	
Min battery current	Ah	130 (24V)	
Mean battery current	Ah	500 (24V)	
Max starting circuit resistance (to starter)	mΩ	< 70	

Cold starting		
Without air preheating	°C	- 15
With air preheating (if available)	°C	- 25

Emission gaseus and particulales		
NOx (Oxides of nitrogen) [NRSC]	g/kWh	N/A
HC (Hydrocarbons) [NRSC]	g/kWh	N/A
NOX+HC [NRSC]	g/kWh	N/A
CO (Carbon monoxide) [NRSC]	g/kWh	N/A
PM (Particlutes) [NRSC]	g/kWh	N/A
CO2 (Carbon Dioxide) [NRSC]	g/kWh	N/A
NOx (Oxides of nitrogen) [NRTC]	g/kWh	



N67TEVP05.00 G-DRIVE STAGE V



Emission gaseus and particulales

HC (Hydrocarbons) [NRTC]	g/kWh
NOX+HC [NRTC]	g/kWh
CO (Carbon monoxide) [NRTC]	g/kWh
PM (Particulates) [NRTC]	g/kWh
CO2 (Carbon Dioxide) [NRTC]	g/kWh

Maintenance

Oil drain interval	see dedicated GOLD Book document on fluids
Oil filter change	see dedicated GOLD Book document on fluids
Oil refilling time	daily check to evaluate oil refill necessity
CCV filter change	1500 hours or 1 year
Fuel filter change	see dedicated GOLD Book document on fluids
Fuel pre-filter change	see dedicated GOLD Book document on fluids
Belt replacement	1200
Valve lash check /adjustment	2400
AdBlue filter Change	1200
DPF filter service	-
Coolant change	see dedicated GOLD Book document on fluids

Engine Noise

		@1500rpm	@1800rpm
Overall sound pressure (engine only)	dBA		93
Overall sound pressure (with accessories only)	dBA		N/A
Exahust noise (w/o Muffler)	dBA		N/A
Noise spectrum (octave analysis performed at the position of maximum noise) - diagram	Table dB-Hz		N/A
G1 (% of PrP)	%	N/A	N/A
G2 (% of PrP)	%	N/A	N/A
G3 (% of PrP)	%	N/A	N/A
G1 (% of PrP) [open flap]	%	-	60
G2 (% of PrP)[open flap]	%	50	55
G3 (% of PrP)[open flap]	%	45	50
G1 (% of PrP) [closed flap]	%	50	55
G2 (% of PrP) [closed flap]	%	45	-
G3 (% of PrP) [closed flap]	%	40	40
Removal load (G1)	%	-	-
Removal load (G2)	%	-	-
Removal load (G3)	%	-	-
Emergency (xxx)	%	-	-
Emergency (xxx)	%	-	-
Emergency (xxx)	%	-	-

Maximum Rating Performance Data

		@1500rpm	@1800rpm
Torque	Nm		
Ambient Temperature	°C		
EGR Rate	%	-	-
Fuel Flow	g/s	11,1	13,0
Fuel consumption (BSFC) (prime power)	(kg/h) [g/kWh]	[199]	[204]
Fuel consumption (BSFC) (stand by)	(kg/h) [g/kWh]	[199,4]	[204,1]
Fuel consumption (BSFC) (80% prime power)	(kg/h) [g/kWh]	(28,5) [197]	(33) [198]
Fuel consumption (BSFC) (50% prime power)	(kg/h) [g/kWh]	(17,9) [198]	(21) [201]



N67TEVP05.00 G-DRIVE STAGE V



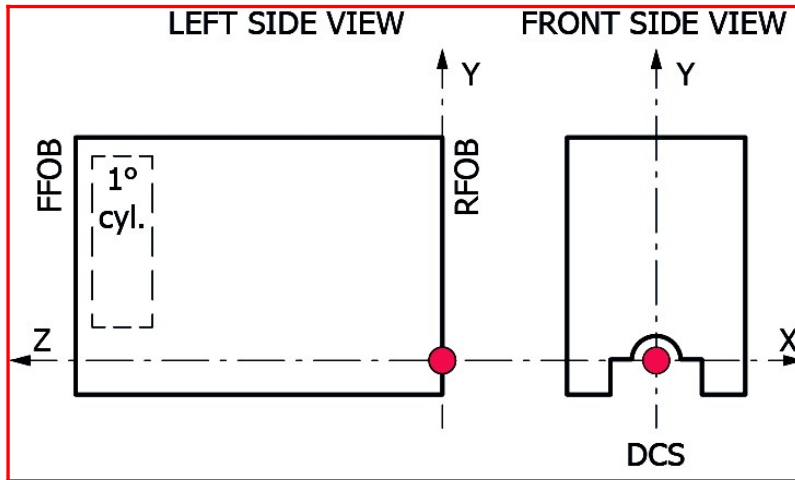
Maximum Rating Performance Data		@1500rpm	@1800rpm
Fuel consumption (BSFC) (25% prime power)	(kg/h) [g/kWh]	(9,5) [211]	(11,5) [220]
AdBlue consumption (prime power)	% of fuel cons	10,2	9,9
AdBlue consumption (stand by)	% of fuel cons	9,2	8,9
AdBlue consumption (80% prime power)	% of fuel cons	10,3	10,2
AdBlue consumption (50% prime power)	% of fuel cons	10,2	10
AdBlue consumption (25% prime power)	% of fuel cons	9,6	9,2
Exhaust Gas Flow	kg/h	858	1007

Design air handling system data		@1500rpm	@1800rpm
EGR flow	kg/h	-	-
EGR pressure	kPa	-	-
Boost pressure (compressor outlet)	kPa	-	-
Pressure drop on charge air cooling system	kPa	-	-
Max temperature after HP-Compressor	°C	-	-
Boost temperature (includes EGR effect)	°C	-	-
Back pressure before DOC	kPa	-	-
Exhaust Gas Temp between HP-TC	°C	-	-
Max Exhaust Gas Temp (after TC)	°C	-	-
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]	76	85
Total Power to coolant (stand by)	kW [kcal/kWh]	84,7	94,7
Total pump water flow	l/s	2,6	3,1
Radiator Coolant Flow (5% less if continuous deaerating system, coolant according to FPT norms)	l/min	-	-
EGR Cooler water flow (for $\Delta T=6^{\circ}C$)	l/s	-	-
LP-CAC water flow (for $\Delta T=6^{\circ}C$)	l/s	-	-
Power in CAC (air to air) (prime power)	kW [kcal/kWh]	24,5	28,2
Power in CAC (air to air) (stand by power)	kW [kcal/kWh]	27,2	31,3
Power Radiated	kW	14,4	16,6

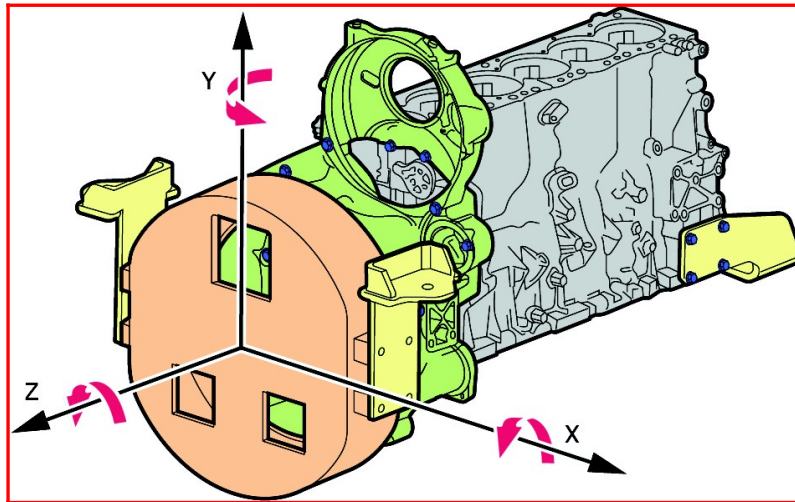
Images



N67TEVP05.00 G-DRIVE STAGE V



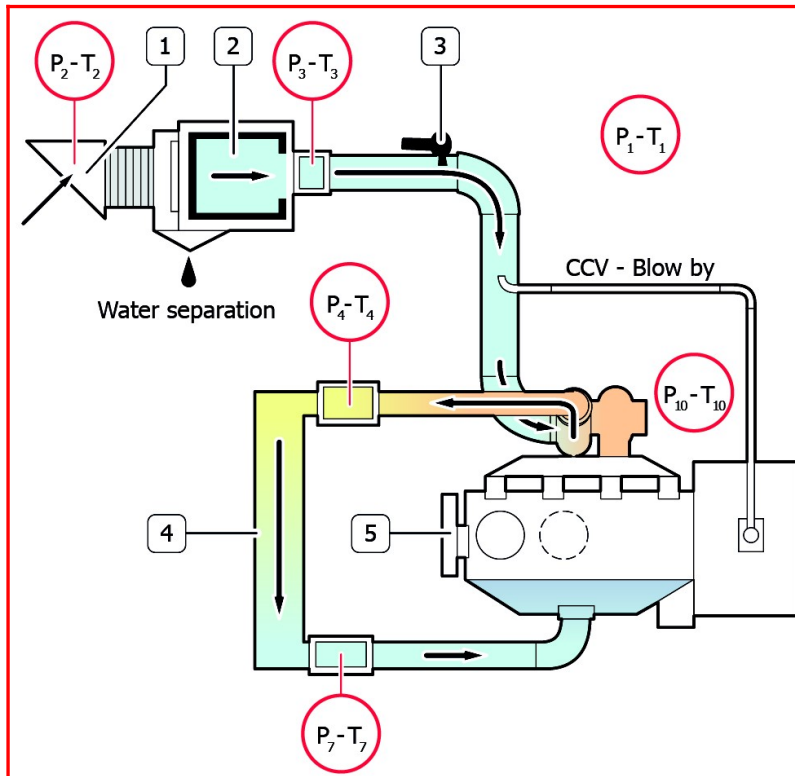
Principal Moment of Inertia



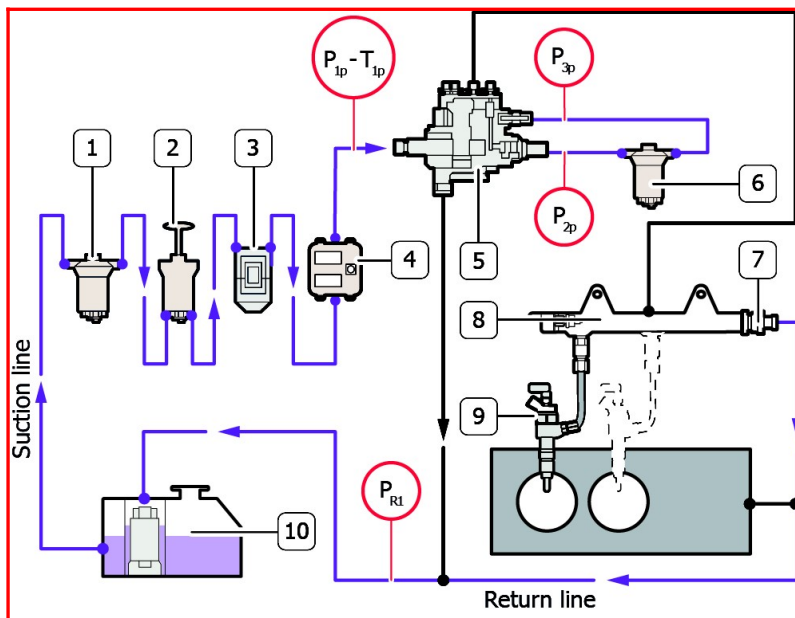
Components



N67TEVP05.00 G-DRIVE STAGE V



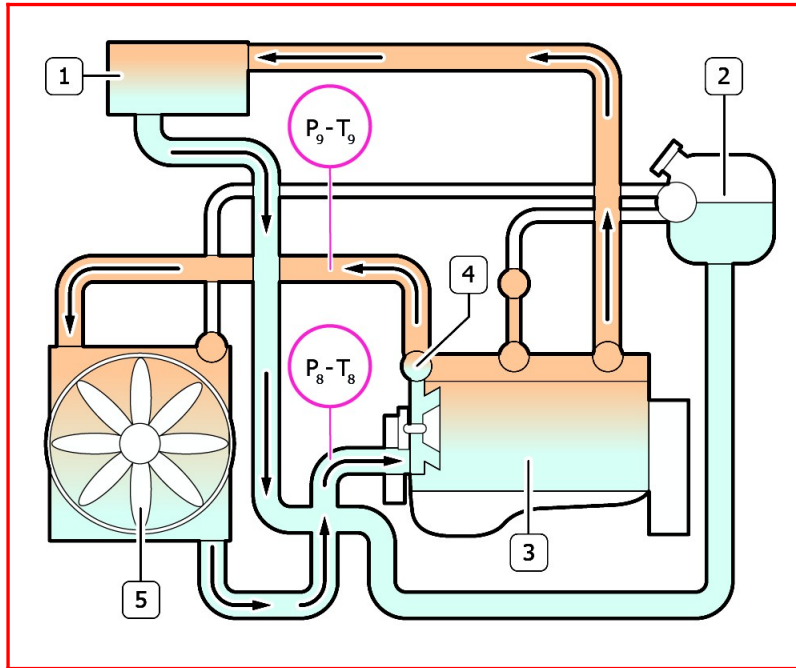
1.Snorkel 2.Air Filter 3.Humidity sensor 4.Intercooler



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



N67TEVP05.00 G-DRIVE STAGE V



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



N67TEVP05.00 G-DRIVE STAGE V



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	SCR on 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 1.0_Nov 2019		May/2020
Revision 2.0_Apr 2021		April/2021