

2500 Series 2506D-E15TA Industrial Engine

EU Stage IIIA, U.S. EPA Tier 3
328-444 kW / 440-595 hp

The ability to power your machine line-up with one engine supplier is truly achievable with Perkins. We have introduced a platform of 9-18 litre industrial engines that completes our market-leading industrial power range and covers 8.8-597 kW (11.8-800 hp).

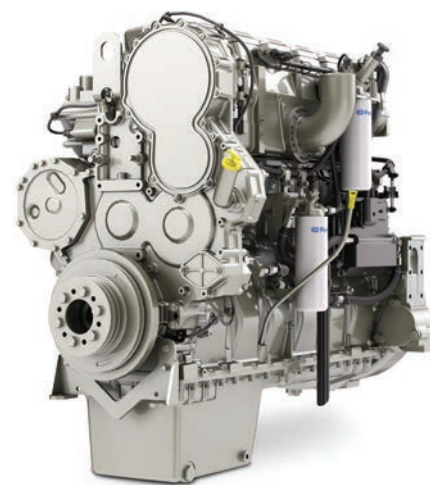
This model is a turbocharged, air-to-air chargecooled, 15.2 litre, 6 cylinder product capable of producing 444 kW (595 hp).

The exceptional power density and reliability of these engines make them an ideal choice for applications operating in countries that meet equivalent Stage IIIA/ Tier 3 and China III emissions standards.

To support the demands of your machine installation we offer a choice of engine configurations and options. The robust technology allows you to integrate these engines into your equipment with the minimum of re-engineering.

Perkins has developed a reputation for designing and building reliable and durable engines for the most demanding applications. Choosing Perkins as your engine supplier means your development costs can be reduced and your machines are future-proofed to meet anticipated emissions standards.

Designed to meet EU Stage IIIA and U.S. EPA Tier 3 equivalent emissions standards.



Specification		
Number of cylinders	6 vertical in-line	
Bore and stroke	137 x 171 mm	5.4 x 6.7 in
Displacement	15.2 litres	928 cubic in
Aspiration	Turbocharged aftercooled	
Cycle	4 stroke	
Combustion system	Direct injection	
Compression ratio	18.0:1	
Rotation	Anti-clockwise, viewed on flywheel	
Total lubricating capacity	38-64 litres	10-16.9 US gal
Cooling system	Liquid	

Features and benefits

Dependable power

- World-class manufacturing capability and processes coupled with proven core engine designs assure reliability, quiet operation and many hours of productive life

High performance

- Simple and efficient turbocharger provides optimal air management and improved fuel efficiency

Lifetime of low cost

- Fuel consumption optimised to match operating cycles of a wide range of equipment and applications.
- Capability of 500 hour oil change intervals enables low-cost maintenance

Fuel and oil

- Approved for operation on biodiesel* concentrations of up to 20%*

Package size

- Exceptional power density enables standardisation across numerous applications. Multiple installation options available to minimize total package size

Local support, global coverage

- Perkins recognise that the customer relationship is important to machine manufacturers and we can offer a range of flexible solutions to help provide appropriate support, either to the OEM's network or directly to the machine customer
- With highly trained Perkins distributors in thousands of communities in over 180 countries, you are never far away from expert product knowledge, genuine parts and a range of advanced diagnostic technology for keeping your engine in peak condition
- To find your local distributor: www.perkins.com/distributor

*Subject to conformance with ASTM D6751 and EN14214

Technical information

Air inlet

- Turbocharged aftercooled

Control system

- Full electronic control system
- All connectors and wiring looms waterproof and designed to withstand harsh off-highway environments
- Flexible and configurable software features and well supported SAE J1939 CAN bus enables highly integrated machines

Cooling system

- Vertical outlet thermostat housing, centrifugal water pump
- Detailed guidance on cooling system design and validation available to ensure machine reliability

Flywheel and housing

- Wide choice of drivetrain interfaces, SAE0 and SAE1 configurations

Fuel and fuel system

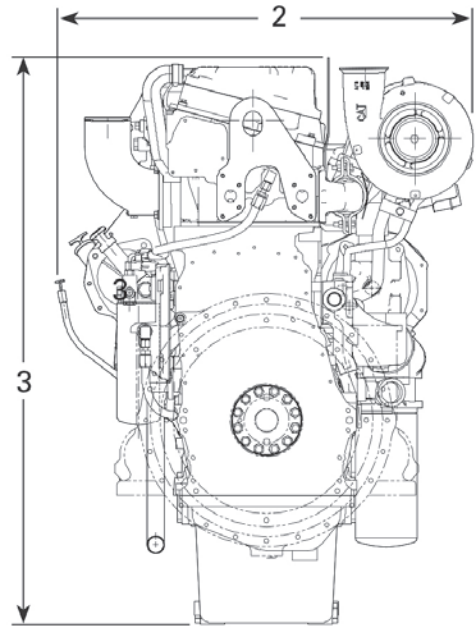
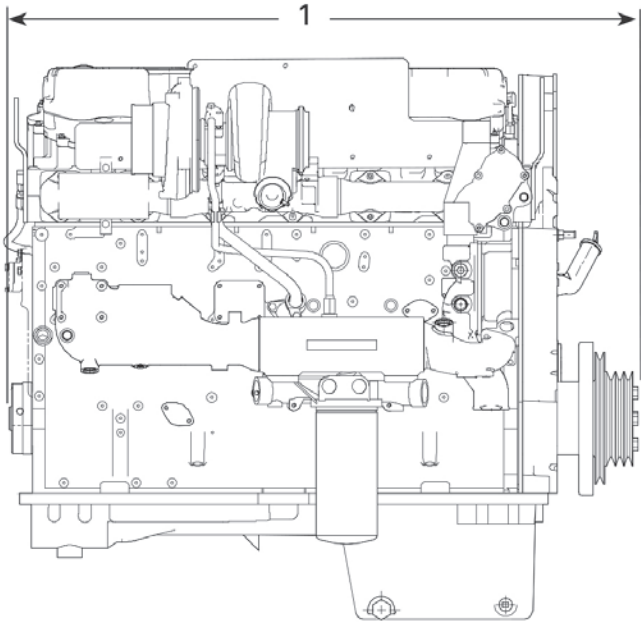
- Mechanical Unit Injector Fuel system, controlled electronically

Oil system

- Choice of sumps for different applications
- Open crankcase ventilation system with fumes disposal (optional OCV filter system)
- Oil cooler, oil filler, oil filter, oil dipstick, oil pump (gear-driven)

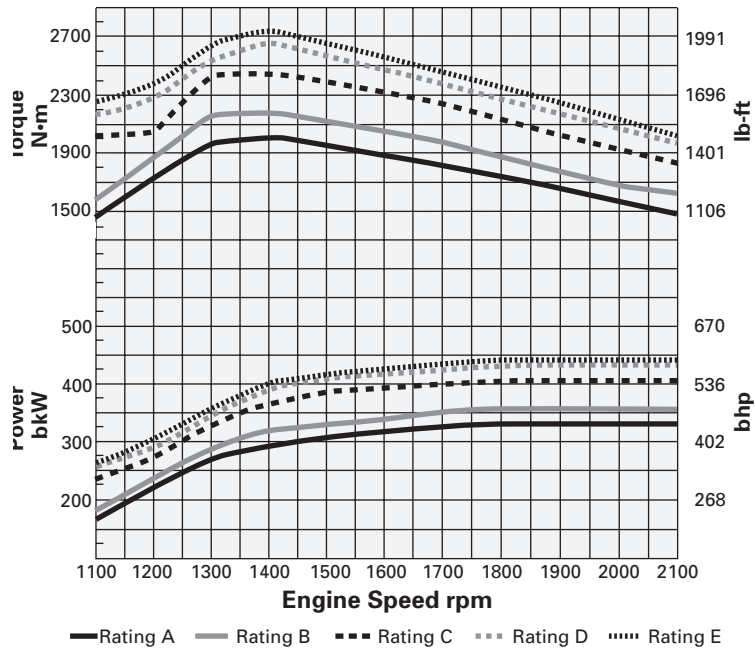
Power take-off

- SAE1 power take-off available with optional SAE A, SAE B and SAE C power take-off drives
 - Engine power can also be taken from the front of the engine on some applications
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Engine dimensions and weight

1	Length	1377 mm	54.2 in
2	Width	926 mm	36.5 in
3	Height	1226 mm	48.3 in
	Weight	1469 kg	3239 lb



Speed rpm	Power kW	Power hp	Speed rpm	Torque Nm	Torque lb-ft	Rating type
2100	328	440	1400	2012	1484	A
2100	354	475	1400	2169	1600	B
2100	403	540	1400	2466	1819	C
2100	433	580	1400	2648	1953	D
2100	444	595	1400	2717	2004	E

Rating definitions and conditions

IND-A (Continuous) for heavy duty service where the engine is operated at maximum power and speed up to 100% of the time without interruption or load cycling.

IND-B for service where power and/or speed are cyclic (time at full load not to exceed 80%).

IND-C (Intermittent) is the horsepower and speed capability of the engine where maximum power and/or speed are cyclic (time at full load not to exceed 50%).

IND-D for service where maximum power is required for periodic overloads (time at full load not to exceed 10% of the duty cycle).

IND-E for service where maximum power is required for a short time for initial starting or sudden overload. For emergency service where standard power is unavailable (time at full load not to exceed 5% of the duty cycle).

Rating Conditions for Diesel Engines – 7 litre and higher

All rating conditions are based on SAE J1995, inlet air standard conditions of 99 kPa (29.31 in. Hg) dry barometer and 25°C (77°F) temperature. Performance is measured using a standard fuel with fuel gravity of 35° API having a lower heating value of 42,780 kJ/kg (18,390 btu/lb) when used at 29°C (84.2°F) with a density of 838.9 g/L.

PERFORMANCE DATA (Metric) - B-Tier 354 BKW

Performance Number: DM7707

Change Level: 05

SALES MODEL:	2506D	COMBUSTION:	DI
BRAND:	Perkins	ENGINE SPEED (RPM):	2,100
ENGINE POWER (BKW):	354.0	PEAK TORQUE SPEED (RPM):	1,400
PEAK TORQUE (NM):	2,171.0	TORQUE RISE (%):	35
COMPRESSION RATIO:	18	ASPIRATION:	TA
RATING LEVEL:	INDUSTRIAL B	AFTERCOOLER TYPE:	ATAAC
PUMP QUANTITY:	1	AFTERCOOLER CIRCUIT TYPE:	JW+OC, ATAAC
FUEL TYPE:	DIESEL	INLET MANIFOLD AIR TEMP (C):	49
MANIFOLD TYPE:	DRY	JACKET WATER TEMP (C):	89
GOVERNOR TYPE:	ELEC	TURBO CONFIGURATION:	SINGLE
INJECTOR TYPE:	EUI	TURBO QUANTITY:	1
REF EXH STACK DIAMETER (MM):	152	TURBOCHARGER MODEL:	GTA4702BS-53T-1.27
MAX OPERATING ALTITUDE (M):	1,500	CERTIFICATION YEAR:	205
		PISTON SPD @ RATED ENG SPD (M/SEC):	12.0

General Performance Data

ENGINE SPEED	ENGINE POWER	ENGINE TORQUE	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
RPM	BKW	NM	KPA	G/BKW-HR	L/HR	KPA	DEG C	DEG C	KPA	DEG C
2,100	354	1,611	1,332	220.2	93.6	143.3	48.9	624.2	148.8	493.1
2,000	354	1,691	1,398	216.2	92.0	143.3	48.0	618.2	139.4	491.0
1,900	354	1,780	1,472	210.8	89.5	143.9	46.6	618.2	130.9	493.9
1,800	354	1,879	1,554	207.8	88.3	145.2	46.5	621.2	122.1	499.4
1,700	350	1,966	1,625	206.3	86.7	147.1	45.3	630.1	114.6	510.2
1,600	343	2,047	1,692	207.6	85.5	146.9	44.8	641.3	105.1	523.8
1,500	332	2,114	1,747	212.7	85.0	155.4	43.8	664.5	102.7	545.2
1,400	318	2,169	1,793	215.6	82.5	156.6	43.6	681.0	95.0	559.3
1,300	292	2,145	1,773	215.7	75.7	147.0	41.0	680.0	83.4	559.0
1,200	235	1,866	1,543	215.0	60.5	127.8	37.7	650.9	69.2	533.4
1,100	183	1,587	1,312	210.5	46.2	81.2	32.9	605.0	44.4	519.4

ENGINE SPEED	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	ENGINE OUTLET WET EXH VOL FLOW RATE (0 DEG C AND 101 KPA)	ENGINE OUTLET DRY EXH VOL FLOW RATE (0 DEG C AND 101 KPA)
RPM	BKW	KPA	DEG C	M3/MIN	M3/MIN	KG/HR	KG/HR	M3/MIN	M3/MIN
2,100	354	153	151.6	32.8	87.0	2,281.6	2,360.2	31.0	28.5
2,000	354	152	149.6	31.6	83.3	2,189.8	2,266.9	29.8	27.3
1,900	354	152	148.2	30.5	80.6	2,107.8	2,182.8	28.7	26.3
1,800	354	152	146.8	29.3	77.9	2,021.9	2,095.9	27.5	25.2
1,700	350	154	147.1	28.2	75.9	1,940.7	2,013.4	26.5	24.2
1,600	343	153	146.3	26.6	73.0	1,831.6	1,903.4	25.0	22.8
1,500	332	161	151.7	26.2	73.6	1,799.0	1,870.3	24.6	22.4
1,400	318	161	152.8	24.8	70.8	1,699.4	1,768.6	23.2	21.1
1,300	292	151	148.1	22.4	63.8	1,530.5	1,593.9	20.9	19.0
1,200	235	131	137.5	19.4	53.1	1,318.0	1,368.7	18.0	16.4
1,100	183	83	105.2	14.2	38.3	965.6	1,004.4	13.2	12.0

PERFORMANCE DATA (Metric) - B-Tier 354 BKW

Heat Rejection Data

ENGINE SPEED	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXH RECOVERY TO 177C	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
RPM	BKW	KW	KW	KW	KW	KW	KW	KW	KW	KW
2,100	354	126	54.0	388	221	49.4	65.5	354	927	987
2,000	354	132	48.8	373	211	48.5	62.2	354	910	969
1,900	354	132	37.1	361	205	47.3	59.9	354	887	945
1,800	354	131	37.4	353	201	46.6	56.6	354	875	932
1,700	350	122	39.7	347	200	45.7	55.2	350	858	914
1,600	343	117	50.5	339	197	45.1	52.0	343	846	901
1,500	332	121	40.5	346	206	44.7	54.2	332	839	894
1,400	318	129	32.0	337	203	43.4	51.9	318	815	868
1,300	292	133	22.3	305	183	39.9	45.8	292	748	797

Altitude Derate Data

ALTITUDE CORRECTED POWER CAPABILITY (BKW)

AMBIENT OPERATING TEMP (C)	0	5	10	15	20	25	30	35	40	45	50	55	60	NORMAL
0	354	354	354	354	354	354	354	354	354	354	354	354	354	354
250	354	354	354	354	354	354	354	354	354	354	354	354	354	354
500	354	354	354	354	354	354	354	354	354	354	354	354	354	354
750	354	354	354	354	354	354	354	354	354	354	354	354	348	354
1,000	354	354	354	354	354	354	354	354	354	354	348	343	338	354
1,250	354	354	354	354	354	354	354	354	348	343	337	332	327	354
1,500	354	354	354	354	354	354	348	343	337	332	327	322	317	354
1,750	354	354	354	354	349	343	337	332	326	321	316	311	307	354
2,000	354	354	349	343	337	332	326	321	316	311	306	301	297	346
2,250	351	344	338	332	327	321	316	311	306	301	296	292	287	337
2,500	339	333	327	322	316	311	306	301	296	291	287	282	278	328
2,750	328	322	317	311	306	301	296	291	286	282	277	273	269	319
3,000	317	312	306	301	296	291	286	281	277	272	268	264	260	310
3,250	307	301	296	291	286	281	276	272	268	263	259	255	252	302
3,500	297	291	286	281	276	272	267	263	259	255	251	247	243	293
3,750	287	281	276	272	267	263	258	254	250	246	242	239	235	285
4,000	277	272	267	262	258	254	249	245	241	238	234	230	227	277
4,250	267	263	258	253	249	245	241	237	233	230	226	223	219	269
4,500	258	253	249	245	241	236	233	229	225	222	218	215	212	261

PERFORMANCE DATA (Metric) - C-Tier 403 BKW

Performance Number: DM7520

Change Level: 03

SALES MODEL:	2506D	COMBUSTION:	DI
BRAND:	Perkins	ENGINE SPEED (RPM):	2,100
ENGINE POWER (BKW):	403.0	PEAK TORQUE SPEED (RPM):	1,400
PEAK TORQUE (NM):	2,464.0	ASPIRATION:	TA
COMPRESSION RATIO:	18	AFTERCOOLER TYPE:	ATAAC
RATING LEVEL:	INDUSTRIAL C - INTERMITTENT	AFTERCOOLER CIRCUIT TYPE:	JW+OC, AC
PUMP QUANTITY:	1	INLET MANIFOLD AIR TEMP (C):	49
FUEL TYPE:	DIESEL	JACKET WATER TEMP (C):	99
MANIFOLD TYPE:	DRY	TURBO CONFIGURATION:	SINGLE
GOVERNOR TYPE:	ELEC	TURBO QUANTITY:	1
CAMSHAFT TYPE:	STANDARD	TURBOCHARGER MODEL:	GTA5008BS-53T-1.41
IGNITION TYPE:	CI	CERTIFICATION YEAR:	2005
INJECTOR TYPE:	EUI	PISTON SPD @ RATED ENG SPD (M/SEC):	12.0
REF EXH STACK DIAMETER (MM):	152		
MAX OPERATING ALTITUDE (M):	1,676		

General Performance Data

ENGINE SPEED	ENGINE POWER	ENGINE TORQUE	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
RPM	BKW	NM	KPA	G/BKW-HR	L/HR	KPA	DEG C	DEG C	KPA	DEG C
2,100	403	1,831	1,571	230.2	108.7	169.8	49.7	639.7	160.8	503.3
2,000	403	1,923	1,650	227.8	107.8	173.0	49.8	644.4	152.8	512.1
1,900	403	2,024	1,737	228.0	107.7	178.7	49.7	656.5	148.3	524.7
1,800	403	2,136	1,833	225.2	106.9	182.8	49.7	669.0	142.7	537.5
1,700	398	2,238	1,920	222.5	104.6	183.7	48.6	673.7	134.6	545.5
1,600	390	2,326	1,996	220.8	101.9	184.0	47.4	683.6	126.5	554.9
1,500	378	2,406	2,064	219.4	98.6	183.0	46.1	691.5	117.6	564.5
1,400	362	2,468	2,117	219.6	94.2	183.0	45.1	692.8	110.6	561.1
1,300	332	2,436	2,090	212.1	83.7	157.9	41.4	685.0	89.3	563.1
1,200	268	2,135	1,832	216.5	71.8	139.2	38.8	695.5	72.9	571.3
1,100	242	2,104	1,805	208.2	62.1	101.0	34.7	714.3	48.2	607.8

ENGINE SPEED	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	ENGINE OUTLET WET EXH VOL FLOW RATE (0 DEG C AND 101 KPA)	ENGINE OUTLET DRY EXH VOL FLOW RATE (0 DEG C AND 101 KPA)
RPM	BKW	KPA	DEG C	M3/MIN	M3/MIN	KG/HR	KG/HR	M3/MIN	M3/MIN
2,100	403	179	170.0	37.0	99.9	2,581.9	2,673.1	35.1	32.2
2,000	403	182	169.5	36.1	98.5	2,516.4	2,607.0	34.3	31.4
1,900	403	187	171.3	35.5	98.2	2,467.2	2,557.5	33.6	30.8
1,800	403	191	173.0	34.3	96.6	2,386.5	2,476.2	32.5	29.7
1,700	398	191	171.7	32.8	93.0	2,274.0	2,361.7	31.0	28.3
1,600	390	190	171.2	31.2	89.2	2,152.6	2,238.0	29.4	26.8
1,500	378	189	171.1	29.3	84.8	2,021.1	2,103.9	27.6	25.1
1,400	362	188	172.5	27.5	79.2	1,893.5	1,972.5	25.9	23.5
1,300	332	162	161.5	23.5	67.6	1,610.3	1,680.5	22.1	19.9
1,200	268	143	155.6	20.2	58.6	1,381.1	1,441.3	18.9	17.1
1,100	242	104	130.2	15.8	47.6	1,071.4	1,123.4	14.8	13.2

PERFORMANCE DATA (Metric) - C-Tier 403 BKW

Heat Rejection Data

ENGINE SPEED	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXH RECOVERY TO 177C	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
RPM	BKW	KW	KW	KW	KW	KW	KW	KW	KW	KW
2,100	403	151	82.6	451	259	58.7	86.8	403	1,102	1,174
2,000	403	146	80.5	448	260	58.1	84.2	403	1,090	1,161
1,900	403	144	80.5	451	265	58.1	83.8	403	1,091	1,162
1,800	403	142	72.6	449	266	57.4	82.2	403	1,078	1,148
1,700	398	140	70.1	436	260	56.1	78.3	398	1,053	1,122
1,600	390	137	67.0	422	254	54.5	74.5	390	1,023	1,090
1,500	378	133	63.7	405	245	52.5	70.6	378	985	1,050
1,400	362	129	68.4	379	228	50.3	67.4	362	944	1,006
1,300	332	117	61.8	326	195	44.5	54.0	332	836	890

Altitude Derate Data

ALTITUDE CORRECTED POWER CAPABILITY (BKW)

AMBIENT OPERATING TEMP (C)	0	5	10	15	20	25	30	35	40	45	50	55	60	NORMAL
ALTITUDE (M)														
0	403	403	403	403	403	403	403	403	403	403	403	403	403	403
250	403	403	403	403	403	403	403	403	403	403	403	403	403	403
500	403	403	403	403	403	403	403	403	403	403	403	403	403	403
750	403	403	403	403	403	403	403	403	403	403	403	403	403	403
1,000	403	403	403	403	403	403	403	403	403	403	403	399	393	403
1,250	403	403	403	403	403	403	403	403	403	399	393	387	381	403
1,500	403	403	403	403	403	403	403	399	392	386	380	375	369	403
1,750	403	403	403	403	403	399	393	386	380	374	368	363	357	403
2,000	403	403	403	400	393	386	380	374	368	362	357	351	346	403
2,250	403	401	394	387	380	374	368	362	356	350	345	340	335	392
2,500	395	388	381	374	368	362	356	350	345	339	334	329	324	382
2,750	382	375	369	362	356	350	344	339	333	328	323	318	313	371
3,000	370	363	356	350	344	339	333	328	322	317	312	308	303	361
3,250	357	351	345	339	333	327	322	317	312	307	302	297	293	351
3,500	345	339	333	327	322	316	311	306	301	296	292	287	283	341
3,750	334	328	322	316	311	306	301	296	291	286	282	278	274	332
4,000	322	317	311	306	300	295	290	286	281	277	272	268	264	322
4,250	311	306	300	295	290	285	281	276	272	267	263	259	255	313
4,500	301	295	290	285	280	275	271	266	262	258	254	250	246	304

Performance Parameter Reference

APPLICATION:

Engine performance tolerance values below are based on engine simulation analysis.

PERFORMANCE PARAMETER TOLERANCE FACTORS:

Power	+/- 5%
Torque*	+/- 5%
Exhaust stack temperature	+/- 8%
Inlet airflow	+/- 10%
Intake manifold pressure-gage	+/- 12%
Exhaust flow	+/- 10%
Specific fuel consumption	+/- 5%
Fuel rate	+/- 7%
Heat rejection	+/- 10%
Heat rejection exhaust only	+/- 15%

OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE AIR AND FUEL CONDITIONS.

MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE -

Location for air temperature measurement air cleaner inlet at stabilized operating conditions.

REFERENCE EXHAUST STACK DIAMETER -

The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.

REFERENCE FUEL -

DIESEL -

Reference fuel is #2 distillate diesel with a 35° API gravity; A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 29°C (84.2°F), where the density is 838.9 G/Liter (7.001 Lbs/Gal).

ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS EXTERNAL AUXILIARY LOAD -

Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps.

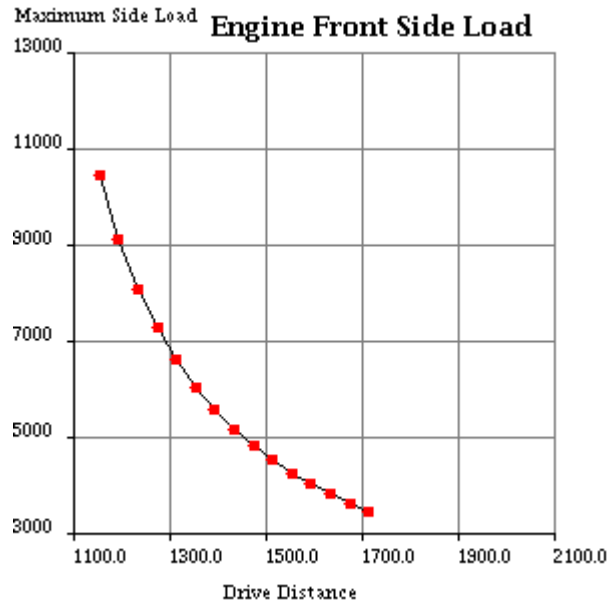
Engine net power available for the external (flywheel) load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel output power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators.

AIR INTAKE SYSTEM		
<i>THE INSTALLED SYSTEM MUST COMPLY WITH THE SYSTEM LIMITS BELOW FOR ALL EMISSIONS CERTIFIED ENGINES TO ASSURE REGULATORY COMPLIANCE.</i>		
MAXIMUM ALLOWABLE INTAKE RESTRICTION WITH CLEAN ELEMENT	3.7	KPA
MAXIMUM ALLOWABLE INTAKE RESTRICTION WITH DIRTY ELEMENT	7.5	KPA
MAXIMUM ATAAC OUTLET TEMPERATURE (25C/77F DAY)	49	DEG C
MAXIMUM PRESSURE DROP FROM COMPRESSOR OUTLET TO MANIFOLD INLET (OR MIXER INLET FOR EGR)	15	KPA
MAXIMUM TURBO INLET AIR TEMPERATURE	48	DEG C
COOLING SYSTEM		
ENGINE ONLY COOLANT CAPACITY	21.9	L
MAXIMUM ALLOWABLE JACKET WATER OUTLET TEMPERATURE	104	DEG C
MAXIMUM UNINTERRUPTED FILL RATE	19	L/MIN
MINIMUM ALLOWABLE COOLANT LOSS (PERCENTAGE OF TOTAL)	12	PERCENT
COOLANT LOSS-MAXIMUM PERCENTAGE OF PUMP PRESSURE RISE LOSS	10	PERCENT
MAXIMUM PERCENTAGE OF PUMP PRESSURE RISE LOSS (JW PUMP CAVITATION SENSITIVITY)	10	PERCENT
AMBIENT COOLING CAPABILITY AT RATED SPEED	43	DEG C
MINIMUM RECOMMENDED SYSTEM PRESSURE CAPACITY PRESSURE		KPA
ENGINE SPEC SYSTEM		
CYLINDER ARRANGEMENT	INLINE	
NUMBER OF CYLINDERS	6	
CYLINDER BORE DIAMETER	137.2	MM
PISTON STROKE	171.4	MM
TOTAL CYLINDER DISPLACEMENT	15.2	L
STANDARD CRANKSHAFT ROTATION FROM FLYWHEEL END	CCW	
STANDARD CYLINDER FIRING ORDER	1-5-3-6-2-4	
NUMBER 1 CYLINDER LOCATION	FRONT	
STROKES/COMBUSTION CYCLE	4	
EXHAUST SYSTEM		
<i>THE INSTALLED SYSTEM MUST COMPLY WITH THE SYSTEM LIMITS BELOW FOR ALL EMISSIONS CERTIFIED ENGINES TO ASSURE REGULATORY COMPLIANCE.</i>		
MAXIMUM ALLOWABLE SYSTEM BACK PRESSURE	10	KPA
MANIFOLD TYPE	DRY	
MAXIMUM ALLOWABLE STATIC WEIGHT ON EXHAUST CONNECTION	20	KG
MAXIMUM ALLOWABLE STATIC BENDING MOMENT ON EXHAUST CONNECTION	0	NM
FUEL SYSTEM		
MAXIMUM FUEL FLOW FROM TRANSFER PUMP TO ENGINE	369	L/HR
MAXIMUM ALLOWABLE FUEL SUPPLY LINE RESTRICTION	30	KPA
MAXIMUM ALLOWABLE FUEL TEMPERATURE AT TRANSFER PUMP INLET	79	DEG C
MAXIMUM FUEL FLOW TO RETURN LINE FROM ENGINE	269	L/HR
MAXIMUM ALLOWABLE FUEL RETURN LINE RESTRICTION	27	KPA
NORMAL FUEL PRESSURE IN A CLEAN SYSTEM	621	KPA
FUEL SYSTEM TYPE	EUI	
MAXIMUM TRANSFER PUMP PRIMING LIFT WITHOUT PRIMING PUMP	3.7	M
LUBE SYSTEM		
CRANKCASE VENTILATION TYPE	TO ATM	
MAXIMUM REMOTE OIL FILTER PRESSURE DROP	120	KPA
MOUNTING SYSTEM		
CENTER OF GRAVITY LOCATION - X DIMENSION - FROM REAR FACE OF BLOCK - (REFERENCE TM7077)	587	MM
CENTER OF GRAVITY LOCATION - Y DIMENSION - FROM CENTERLINE OF CRANKSHAFT - (REFERENCE TM7077)	255	MM
CENTER OF GRAVITY LOCATION - Z DIMENSION - FROM CENTERLINE OF CRANKSHAFT - (REFERENCE TM7077)	0	MM
DRY WEIGHT - ENGINE ONLY (REFERENCE VALUE)	1469	KG
LENGTH - ENGINE ONLY (REFERENCE VALUE)	1436	MM

MAXIMUM ALLOWABLE STATIC SHEAR LOAD AT FRONT FACE OF FRONT HOUSING	499	KG
STARTING SYSTEM		
MINIMUM CRANKING SPEED REQUIRED FOR START-RPM	100	
LOWEST AMBIENT START TEMPERATURE WITHOUT AIDS	0	DEG C

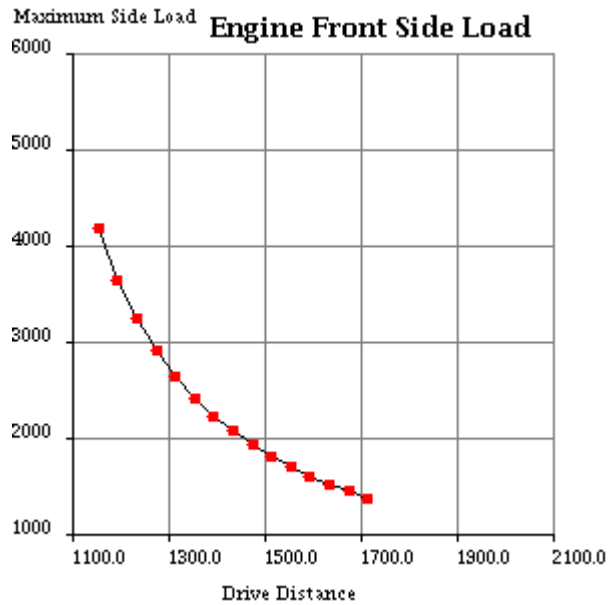
Drive Type - Chain

D-DIST MM	MAX SIDE LOAD NEWTON
1,715	3,431
1,675	3,604
1,635	3,795
1,595	4,007
1,555	4,245
1,515	4,513
1,475	4,816
1,435	5,164
1,395	5,565
1,355	6,034
1,315	6,590
1,275	7,258
1,235	8,077
1,195	9,105
1,155	10,432



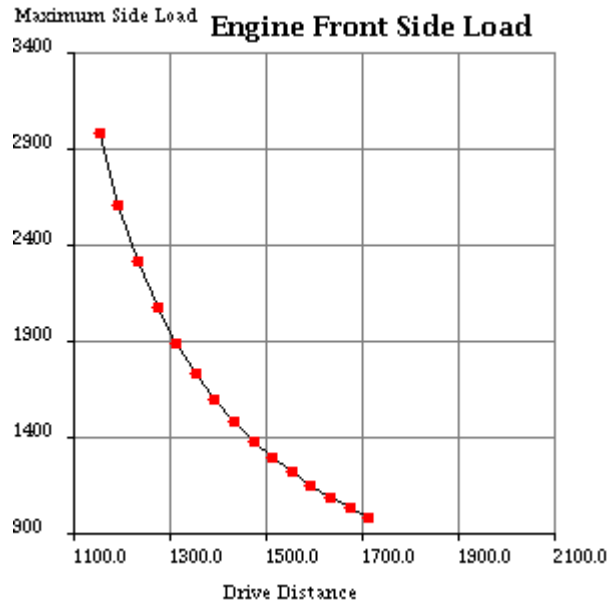
Drive Type - VEE Belt

D-DIST MM	MAX SIDE LOAD NEWTON
1,715	1,372
1,675	1,442
1,635	1,518
1,595	1,603
1,555	1,698
1,515	1,805
1,475	1,927
1,435	2,066
1,395	2,226
1,355	2,414
1,315	2,636
1,275	2,903
1,235	3,231
1,195	3,642
1,155	4,173



Drive Type - Flat Belt

D-DIST MM	MAX SIDE LOAD NEWTON
1,715	980
1,675	1,030
1,635	1,084
1,595	1,145
1,555	1,213
1,515	1,289
1,475	1,376
1,435	1,475
1,395	1,590
1,355	1,724
1,315	1,883
1,275	2,074
1,235	2,308
1,195	2,601
1,155	2,980



Reference

Number: DM9985

No notes found...

Parameters

Reference: TM6012

ENGINE SIDE LOAD DATA

DEFINITIONS:

KW - TRANSMITTED POWER LEVEL.

PD - PITCH DIAMETER IN MM OF DRIVE SPROCKET OR MEAN BELT DIAMETER.

D - DISTANCE IN MM FROM FRONT OR REAR SIDE LOAD CENTER TO INDEX LOCATION (REAR FACE OF CYLINDER BLOCK UNLESS OTHERWISE SPECIFIED).

ANALYSIS PROCEDURE:

CALCULATE EACH SIDE LOAD USING THE FOLLOWING FORMULA:

$$(KW \times 19099000) / (RPM \times PD) = \text{SIDE LOAD (IN NEWTONS)}$$

PROPOSED MULTIPLE DRIVE LOADS AND DIRECTIONS FROM THE SAME SHAFT MUST BE RESOLVED INTO ONE SINGLE DIRECTION AND LOAD BY VECTOR ADDITION BEFORE PROCEEDING.

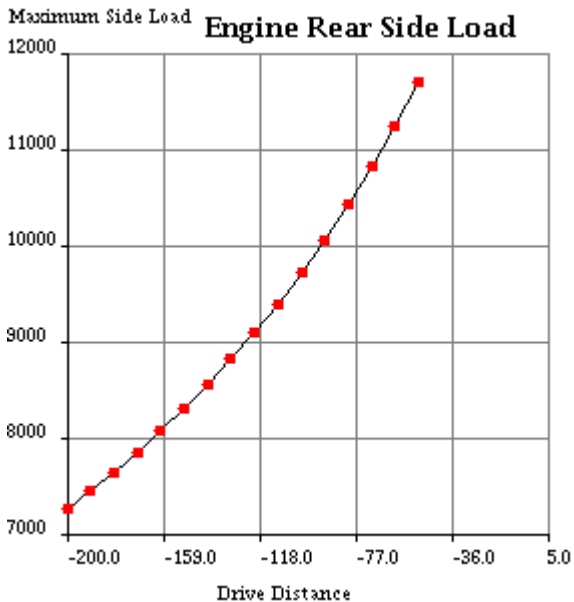
THE RESULTANT SIDE LOAD MUST NOT EXCEED THE SIDE LOAD LIMIT FOUND IN THE TABLE FOR THE SELECTED DRIVE TYPE AT THE LOAD CENTER DISTANCE(D) UTILIZED.

FOR MORE ACCURATE CALCULATION OF THE SIDE LOAD, PLEASE REFER TO BELT DRIVE END LOAD CALCULATIONS FOR MINIMUM STATIC TENSION AS PROVIDED BY THE RESPECTIVE BELT MANUFACTURER.

THIS END LOAD CALCULATION ASSUMES A STEADY STATE OPERATING CONDITION F OR NON SHOCK LOAD APPLICATIONS.

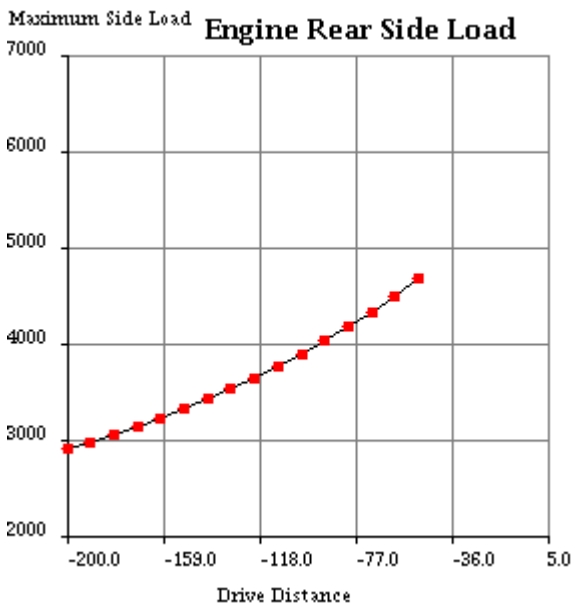
Drive Type - Chain

D-DIST MM	MAX SIDE LOAD NEWTON
-200	7,253
-190	7,442
-180	7,640
-170	7,850
-160	8,071
-150	8,305
-140	8,553
-130	8,817
-120	9,097
-110	9,395
-100	9,714
-90	10,055
-80	10,421
-70	10,815
-60	11,240
-50	11,699



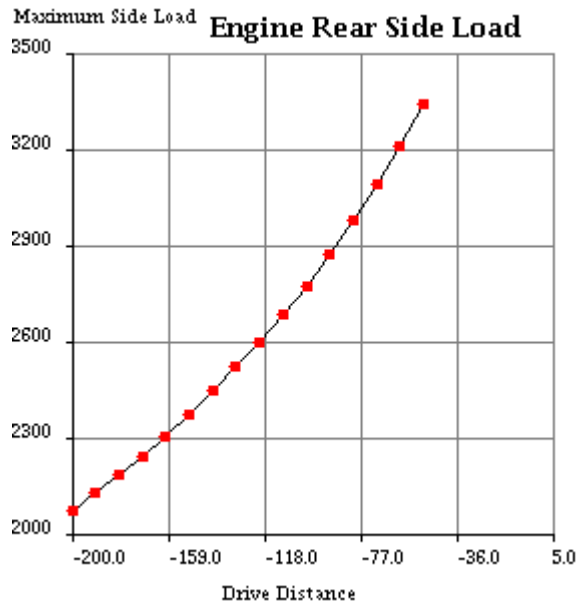
Drive Type - VEE Belt

D-DIST MM	MAX SIDE LOAD NEWTON
-200	2,901
-190	2,977
-180	3,056
-170	3,140
-160	3,228
-150	3,322
-140	3,421
-130	3,527
-120	3,639
-110	3,758
-100	3,886
-90	4,022
-80	4,169
-70	4,326
-60	4,496
-50	4,680



Drive Type - Flat Belt

D-DIST MM	MAX SIDE LOAD NEWTON
-200	2,072
-190	2,126
-180	2,183
-170	2,243
-160	2,306
-150	2,373
-140	2,444
-130	2,519
-120	2,599
-110	2,684
-100	2,775
-90	2,873
-80	2,978
-70	3,090
-60	3,211
-50	3,343



Reference

Number: DM9986

No notes found...

Parameters

Reference: TM6012

ENGINE SIDE LOAD DATA

DEFINITIONS:

KW - TRANSMITTED POWER LEVEL.

PD - PITCH DIAMETER IN MM OF DRIVE SPROCKET OR MEAN BELT DIAMETER.

D - DISTANCE IN MM FROM FRONT OR REAR SIDE LOAD CENTER TO INDEX LOCATION (REAR FACE OF CYLINDER BLOCK UNLESS OTHERWISE SPECIFIED).

ANALYSIS PROCEDURE:

CALCULATE EACH SIDE LOAD USING THE FOLLOWING FORMULA:

$$(KW \times 19099000) / (RPM \times PD) = \text{SIDE LOAD (IN NEWTONS)}$$

PROPOSED MULTIPLE DRIVE LOADS AND DIRECTIONS FROM THE SAME SHAFT MUST BE RESOLVED INTO ONE SINGLE DIRECTION AND LOAD BY VECTOR ADDITION BEFORE PROCEEDING.

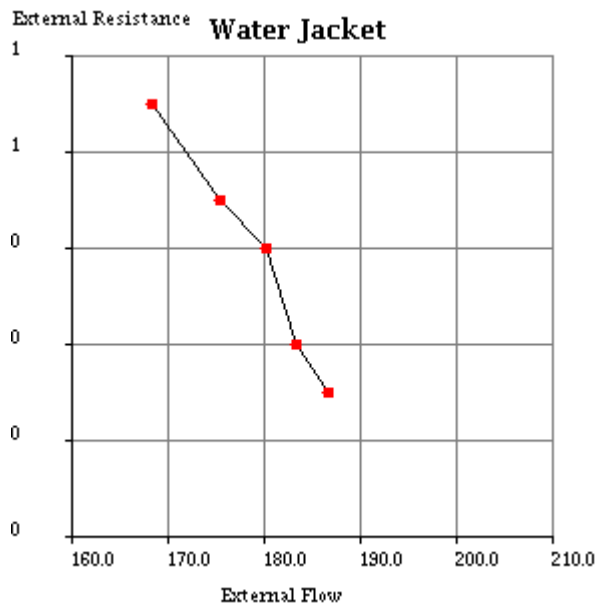
THE RESULTANT SIDE LOAD MUST NOT EXCEED THE SIDE LOAD LIMIT FOUND IN THE TABLE FOR THE SELECTED DRIVE TYPE AT THE LOAD CENTER DISTANCE(D) UTILIZED.

FOR MORE ACCURATE CALCULATION OF THE SIDE LOAD, PLEASE REFER TO BELT DRIVE END LOAD CALCULATIONS FOR MINIMUM STATIC TENSION AS PROVIDED BY THE RESPECTIVE BELT MANUFACTURER.

THIS END LOAD CALCULATION ASSUMES A STEADY STATE OPERATING CONDITION F OR NON SHOCK LOAD APPLICATIONS

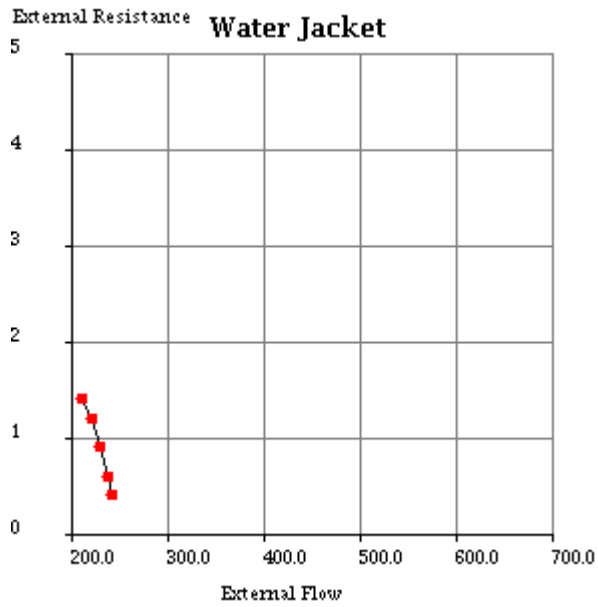
Engine Speed RPM: 900
Pump Speed RPM: 973

EXT RESIST M H2O	EXT FLOW L/MIN
0.3	186.8
0.4	183.5
0.6	180.3
0.7	175.5
0.9	168.4



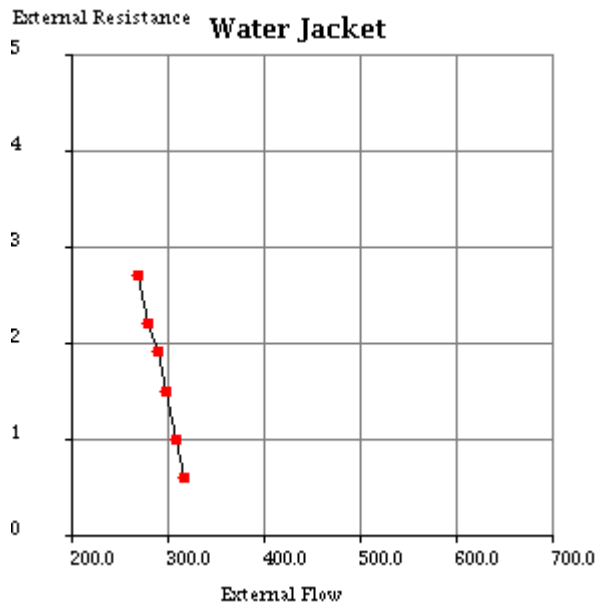
Engine Speed RPM: 1100
Pump Speed RPM: 1189

EXT RESIST M H2O	EXT FLOW L/MIN
0.4	242
0.6	238
0.9	230
1.2	221
1.4	212



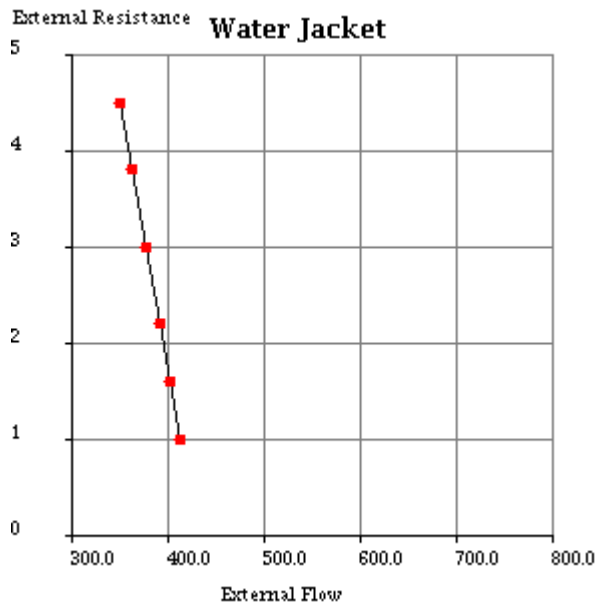
Engine Speed RPM: 1400
Pump Speed RPM: 1513

EXT RESIST M H2O	EXT FLOW L/MIN
0.6	318
1.0	309
1.5	299
1.9	290
2.2	280
2.7	269



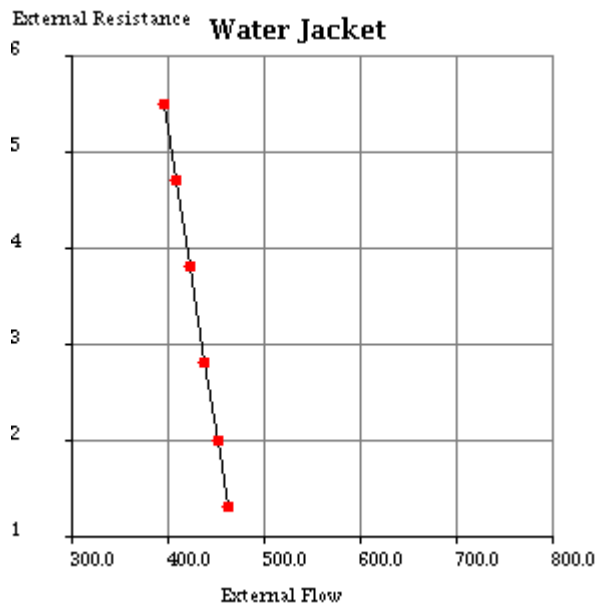
Engine Speed RPM: 1,800
Pump Speed RPM: 1,946

EXT RESIST M H2O	EXT FLOW L/MIN
1.0	413
1.6	403
2.2	393
3.0	378
3.8	364
4.5	351



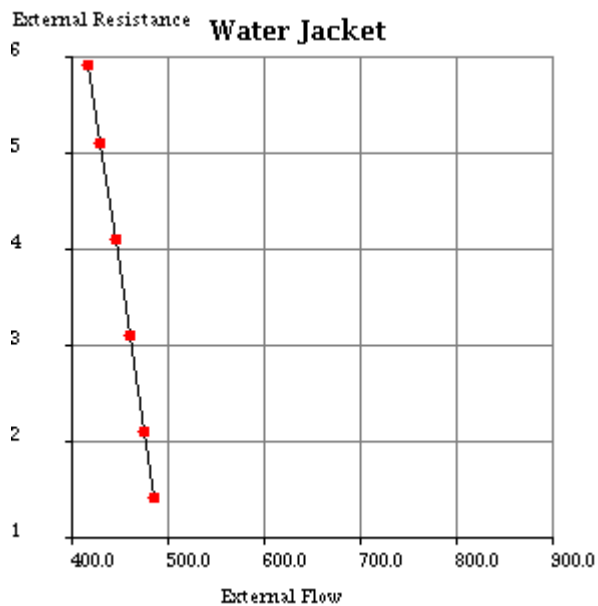
Engine Speed RPM: 2000
Pump Speed RPM: 2162

EXT RESIST M H2O	EXT FLOW L/MIN
1.3	463
2.0	453
2.8	439
3.8	424
4.7	410
5.5	396



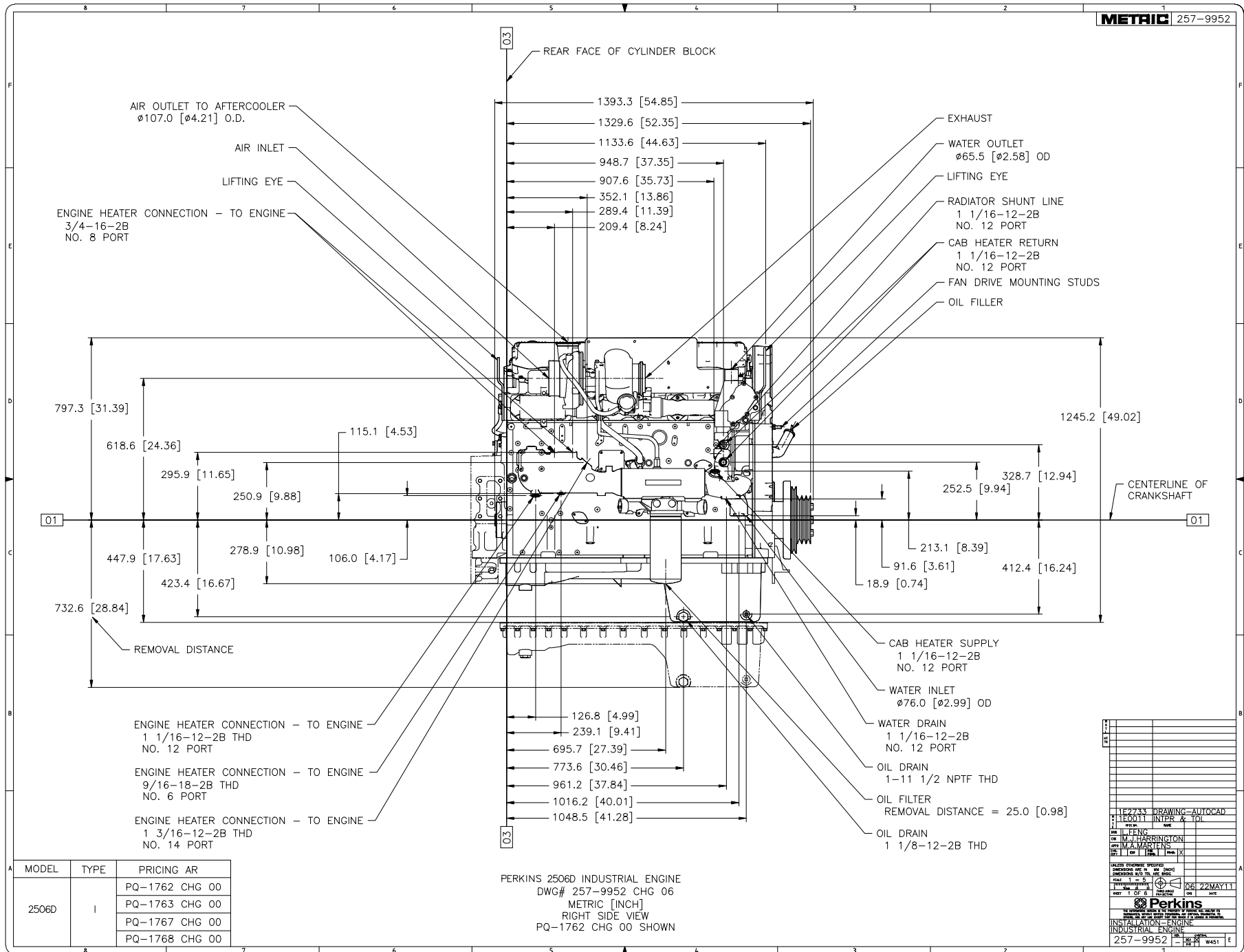
Engine Speed RPM: 2100
Pump Speed RPM: 2270

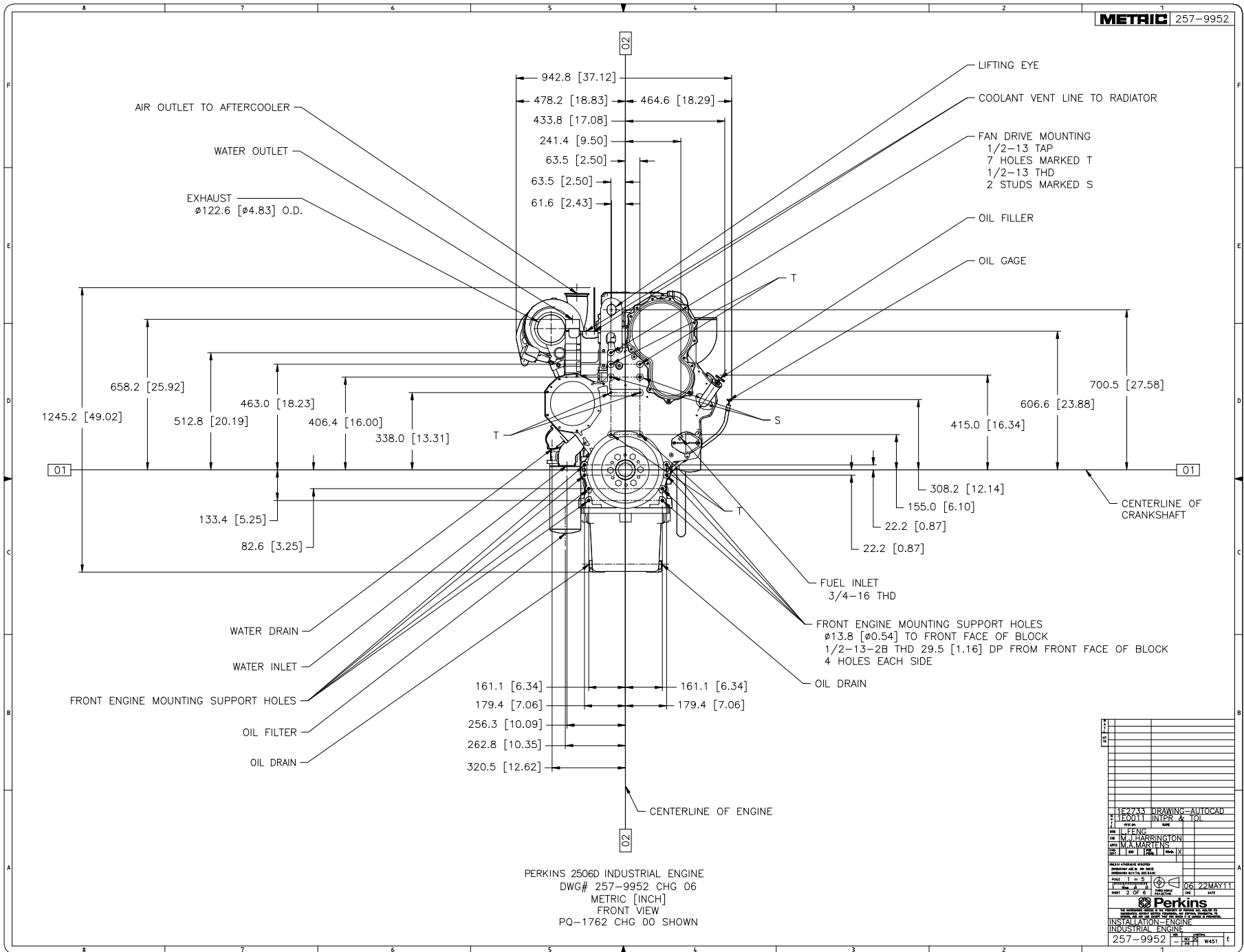
EXT RESIST M H2O	EXT FLOW L/MIN
1.4	487
2.1	476
3.1	461
4.1	446
5.1	431
5.9	417



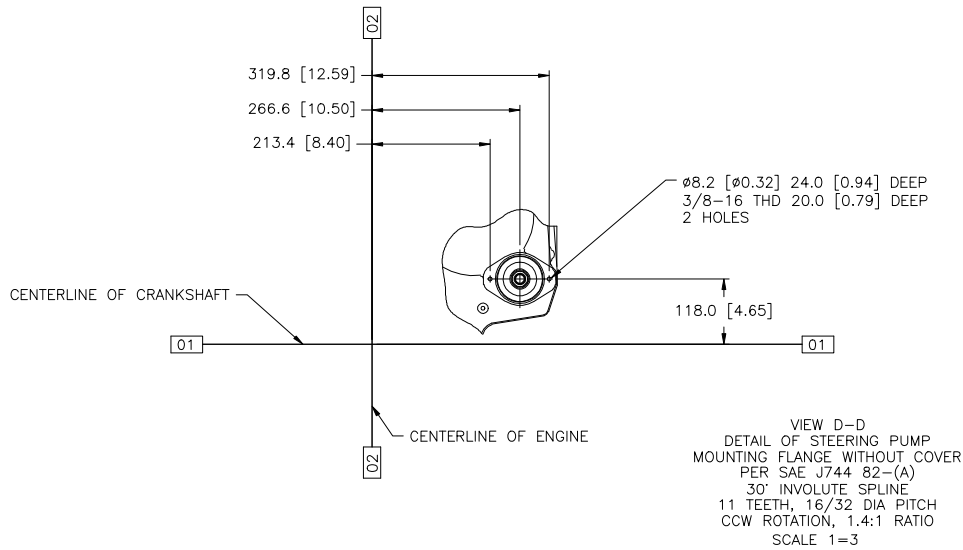
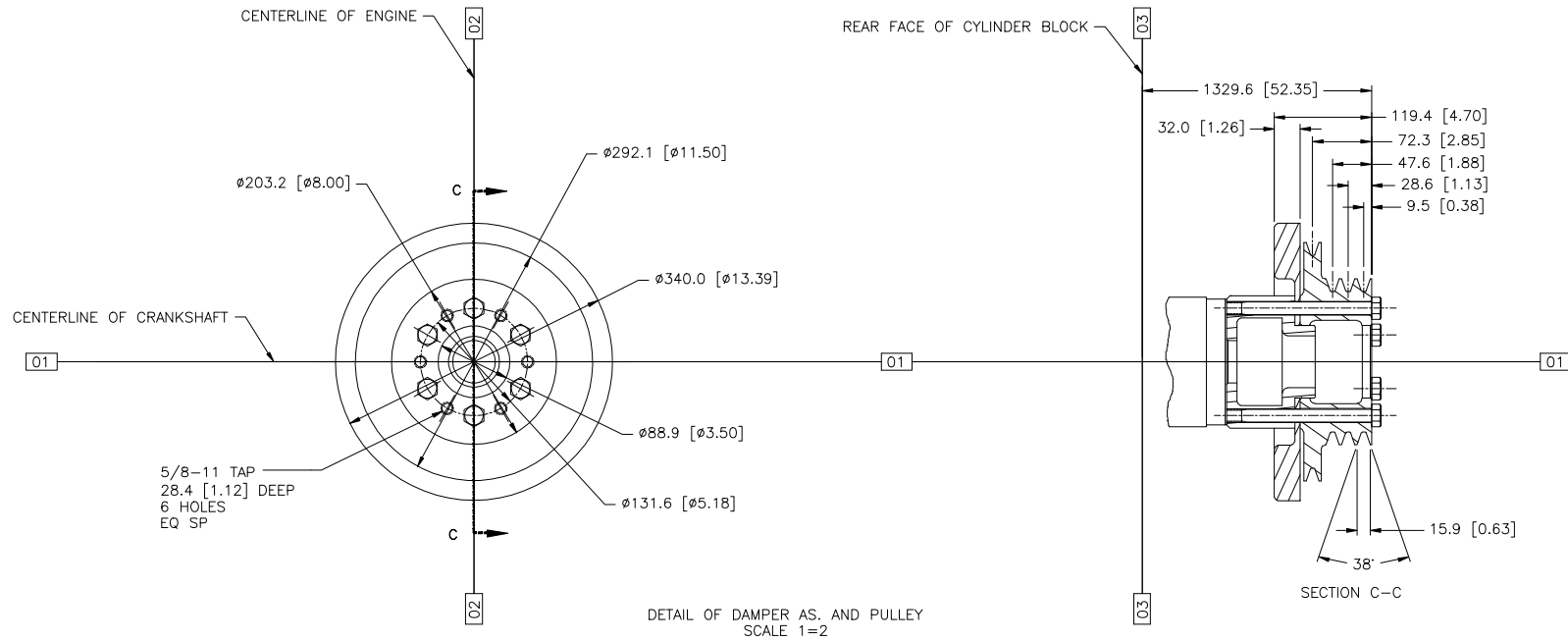
GENERAL DIMENSION DRAWING

METRIC 257-9952





DATE			
DESCRIPTION			
1	17-27-33	DRAWING-AUTOCAD	
2		PERKINS 2506D	
3		ENGINE	
4		BY W. HARRINGTON	
5		CHK M. A. MARTENS	
6		DATE 22 MAY 11	
7		SCALE 1:1	
8		NO. 2 OF 6	
9		PERKINS	
10		INDUSTRIAL ENGINE	
11		257-9952	
12		WAS1	



DATE			
DESCRIPTION			
1	127233	DRAWING-AUTOCAD	
2	110011	INTER & TOI	
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MISCELLANEOUS INFORMATION

Engine Gradeability by Oil Pan Type

OPTDS01 - DEEP SUMP OIL PAN

TECHNICAL: Flat sump with stiffener plate, 68L(18.0 gal) system capacity (initial fill). Capable of 500 hrs oil change interval in normal conditions. Actual interval is determined by Scheduled Oil Sample(SOS).

MAX TILT ANG-CONTIN OP-OIL AT FULL MARK 30 Deg

MAX TILT ANG-CONTIN OP-OIL AT ADD MARK 20 Deg

OPTDS02 - OIL PAN

TECHNICAL: Rear sump, 38 L (10.0 gal) system capacity (initial fill). Capable of 250 hrs oil change interval in normal conditions. Actual interval is determined by Scheduled Oil Sample (SOS).

MAX TILT ANG-CONTIN OP-OIL AT FULL MARK 30 Deg

MAX TILT ANG-CONTIN OP-OIL AT ADD MARK 20 Deg

OPTDS07 - DEEP SUMP OIL PAN

TECHNICAL: Center sump, 64 L (16.9 gal) system capacity (initial fill). Capable of 500 hrs oil change interval in normal conditions. Actual interval is determined by Scheduled Oil Sample (SOS).

MAX TILT ANG-CONTIN OP-OIL AT FULL MARK 30 Deg

MAX TILT ANG-CONTIN OP-OIL AT ADD MARK 20 Deg