INDUSTRIAL ENGINE PERFORMANCE DATA [4CR03970]

JUNE 03, 2019

For Help Desk Phone Numbers Click here

Performance Number: DM2537

Change Level: 01

Sales Model: 3412EDITA
Engine Power: 559.0 KW
Manifold Type: DRY
Turbo Quantity: 2
Application Type: IND-DIESEL
Rating Type: IND-C (INT)

Combustion: DI
Speed: 1,800 RPM
Governor Type: ELECT
Engine App: IN
Engine Rating: IN
Certification: EPA TIER-1 1996 - 2000
EU STAGE-1 1999 - 2001

Aspr: TA
After Cooler: JWAC
After Cooler Temp(C): --
Turbo Arrangement:
Strategy:

General Performance Data

ENGINE SPEED RPM	ENGINE POWER BKW	ENGINE TORQUE N.M	ENGINE BMEP KPA	FUEL BSFC G/BKW-HR	FUEL RATE LPH	INTAKE MFLD TEMP DEG C	INTAKE MFLD P KPA	INTAKE AIR FLOW M3/MIN	EXH MFLD TEMP DEG C	EXH STACK TEMP DEG C	EXH GAS FLOW M3/MIN
1800	559.0	2,966	1,378	211.500	140.9	92.8	164.1	48.8	580.7	430.7	120.1
1700	556.7	3,127	1,453	211.900	140.6	92.7	158.7	45.9	605.2	453.3	116.1
1600	547.7	3,269	1,519	211.800	138.3	92.1	151.4	42.6	625.4	473.2	111.0
1500	531.7	3,385	1,573	211.200	133.8	91.2	142.2	39.1	641.8	490.7	104.8
1400	509.2	3,473	1,614	208.900	126.8	90.0	131.1	35.3	654.5	505.8	97.5
1300	480.6	3,530	1,641	212.900	122.0	90.0	116.8	31.3	693.8	545.6	90.2
1200	447.0	3,557	1,653	217.600	115.9	90.1	100.3	26.8	731.7	584.9	81.9
1100	408.5	3,546	1,648	237.400	115.6	90.3	81.3	22.1	767.4	628.7	72.7

Engine Heat Rejection Data

ENGINE SPEED RPM	ENGINE POWER BKW	REJ TO JW KW	REJ TO ATMOS KW	REJ TO EXHAUST KW	EXH RCOV TO 177C KW	FROM OIL CLR KW	FROM AFT CLR KW	WORK ENERGY KW	LHV ENERGY KW	HHV ENERGY KW
1800	559.0	362.0	126.0	458.0	232.0	75.0	61.0	559.0	1,413.0	1,505.0
1700	556.7	358.0	131.0	458.0	239.0	75.0	57.0	557.0	1,411.0	1,504.0
1600	547.7	350.0	133.0	449.0	240.0	74.0	51.0	548.0	1,389.0	1,480.0
1500	531.7	337.0	132.0	432.0	235.0	72.0	44.0	532.0	1,346.0	1,434.0
1400	509.2	319.0	127.0	404.0	222.0	68.0	36.0	509.0	1,276.0	1,359.0
1300	480.6	307.0	126.0	400.0	229.0	66.0	28.0	481.0	1,233.0	1,314.0
1200	447.0	291.0	124.0	393.0	232.0	63.0	20.0	447.0	1,178.0	1,255.0
1100	408.5	273.0	127.0	384.0	235.0	60.0	12.0	408.0	1,120.0	1,193.0

EMISSIONS DATA

EPA TIER-1 1996 - 2000 ********** A5
Gaseous emissions data measurements are consistent with those described in
EPA 40 CFR PART 89 SUBPART D and ISO 8178 for measuring HC, CO, PM, and NOx

Gaseous emissions values are WEIGHTED CYCLE AVERAGES and are in compliance
with the following non-road regulations:

LOCALITY	AGENCY/LEVEL	MAX LIMITS - g/kW-hr
U. S. (incl Calif)	EPA/Tier-1	CO:11.4 HC:1.3 NOx:9.2 PM:0.5
Europe	EU/Stage-I	CO:5.0 HC:1.3 NOx:9.2 PM:0.5

EU STAGE-1 1999 - 2001 ********** A5
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Europe	EU/Stage-I	CO:5.0 HC:1.3 NOx:9.2 PM:0.5

REFERENCE EXHAUST STACK DIAMETER	203 MM
WET EXHAUST MASS	--
WET EXHAUST FLOW (-- STACK TEMP)	--
WET EXHAUST FLOW RATE (0 DEG C AND 101.2 KPA)	--
DRY EXHAUST FLOW RATE (0 DEG C AND 101.2 KPA)	--
FUEL FLOW RATE	--

Altitude Capability Data(Corrected Power Altitude Capability)

Ambient Operating Temp. Altitude	10 C	20 C	30 C	40 C	50 C	NORMAL
0 M	559 kw	559 kw	559 kw	559 kw	559 kw	559 kw
300 M	559 kw	559 kw	559 kw	559 kw	559 kw	559 kw
500 M	559 kw	559 kw	559 kw	559 kw	559 kw	559 kw
1,000 M	559 kw	559 kw	559 kw	559 kw	546 kw	559 kw
1,500 M	559 kw	559 kw	548 kw	530 kw	514 kw	559 kw
2,000 M	551 kw	532 kw	515 kw	498 kw	483 kw	537 kw
2,500 M	518 kw	500 kw	484 kw	468 kw	454 kw	510 kw
3,000 M	486 kw	470 kw	454 kw	440 kw	426 kw	485 kw
3,500 M	456 kw	440 kw	426 kw	412 kw	400 kw	460 kw
4,000 M	427 kw	413 kw	399 kw	387 kw	375 kw	436 kw
4,500 M	400 kw	387 kw	374 kw	362 kw	351 kw	413 kw
5,000 M	374 kw	362 kw	350 kw	339 kw	328 kw	391 kw
5,500 M	350 kw	338 kw	327 kw	316 kw	307 kw	370 kw
6,000 M	327 kw	315 kw	305 kw	295 kw	286 kw	350 kw

The powers listed above and all the Powers displayed are Corrected Powers

Identification Reference and Notes

Engine Arrangement:	1314014	**Lube Oil Press @ Rated Spd(KPA):**	447.0
Effective Serial No:	4CR00734	**Piston Speed @ Rated Eng SPD(M/Sec):**	9.0
Primary Engine Test Spec:	2T8101	**Max Operating Altitude(M):**	1,600.0
Performance Parm Ref:	TM5737	**PEEC Elect Control Module Ref**	
Performance Data Ref:	DM2537	**PEEC Personality Cont Mod Ref**	154-4642
Aux Coolant Pump Perf Ref:			
Cooling System Perf Ref:		**Turbocharger Model**	S4DS029-1.22VTF
Certification Ref:	EPA TIER-1	**Fuel Injector**	1087090
Certification Year:	1996	**Timing-Static (DEG):**	--
Compression Ratio:	15.6	**Timing-Static Advance (DEG):**	--
Combustion System:	DI	**Timing-Static (MM):**	--
Aftercooler Temperature (C):	--	**Unit Injector Timing (MM):**	--
Crankcase Blowby Rate(M3/H):	--	**Torque Rise (percent)**	20.0
Fuel Rate (Rated RPM) No Load(L/HR):	--	**Peak Torque Speed RPM**	1200
Lube Oil Press @ Low Idle Spd(KPA):	210.0	**Peak Torque (NM):**	--

Reference Number: DM2537

THIS CURVE IS ALSO APPLICABLE WITH ENGINE ARRANGEMENT 131-5358.
EPA TIER-1 19962000A5EU STAGE-1 19992001A5

Parameters Reference: TM5737

DIESEL INDUSTRIAL PERFORMANCE

DEFINITIONS:

IND A - CONTINUOUS HEAVY DUTY SERVICE WHERE THE ENGINE IS OPERATED AT MAXIMUM POWER AND SPEED UP TO 100% OF THE TIME WITHOUT INTERRUPTION OR LOAD CYCLING. TIME AT FULL LOAD CAN BE UP TO 100% OF THE DUTY CYCLE. TYPICAL SERVICE EXAMPLES ARE: PUMPING, VENTILATION, CUSTOMER SPECS.

IND B - FOR SERVICE WHERE POWER AND/OR SPEED ARE CYCLIC. TIME AT FULL LOAD IS NOT TO EXCEED 80% OF THE DUTY CYCLE. TYPICAL SERVICE EXAMPLES ARE: IRRIGATION WHERE NORMAL PUMP DEMAND IS 85% OF ENGINE POWER, OIL FIELD MECHANICAL PUMPING/DRILLING, STATIONARY PLANT AIR COMPRESSORS.

IND C - INTERMITTENT SERVICE WHERE MAXIMUM POWER AND/OR SPEED ARE CYCLIC. THE POWER AND SPEED CAPABILITY OF THE ENGINE CAN BE UTILIZED FOR ONE UNINTERRUPTED HOUR FOLLOWED BY ONE HOUR OF OPERATION AT OR BELOW IND A. TIME AT FULL LOAD IS NOT TO EXCEED 50% OF THE DUTY CYCLE. TYPICAL SERVICE EXAMPLES ARE: AGRICULTURAL TRACTORS, HARVESTERS AND COMBINES, OFF HIGHWAY TRUCKS, FIRE PUMP APPLICATION POWER, BLAST HOLE DRILLS, ROCK CRUSHERS AND WOOD CHIPPERS WITH HIGH TORQUE RISE, AND OIL FIELD HOISTING.

IND D - FOR SERVICE WHERE MAXIMUM POWER IS REQUIRED FOR PERIODIC OVERLOADS. THE MAXIMUM POWER AND SPEED CAPABILITY OF THE ENGINE CAN BE UTILIZED FOR A MAXIMUM OF 30 UNINTERRUPTED MINUTES FOLLOWED BY ONE HOUR AT IND C. TIME AT FULL LOAD IS NOT TO EXCEED 10% OF THE DUTY CYCLE. TYPICAL SERVICE EXAMPLES ARE: OFFSHORE CRANES, RUNWAY SNOW BLOWERS, WATER WELL DRILLS, PORTABLE AIR COMPRESSORS, AND FIRE PUMP CERTIFICATION POWER.

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. THE MAXIMUM POWER AND SPEED CAPABILITY OF THE ENGINE CAN BE UTILIZED FOR A MAXIMUM OF 15 UNINTERRUPTED MINUTES FOLLOWED BY ONE HOUR AT IND C POWER OR DURATION OF THE EMERGENCY. TIME AT FULL LOAD IS NOT TO EXCEED 5% OF THE DUTY CYCLE. TYPICAL SERVICE EXAMPLES ARE: STANDBY CENTRIFUGAL WATER PUMPS, OIL FIELD WELL SERVICING, CRASH TRUCKS AND GAS TURBINE STARTERS.

DIESEL INDUSTRIAL PERFORMANCE

TOLERANCES:

CURVES REPRESENT TYPICAL VALUES OBTAINED UNDER NORMAL OPERATING CONDITIONS. AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES. EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING TOLERANCES:

Power	+/- 3%
Exhaust stack temperature	+/- 8%
Inlet airflow	+/- 5%
Intake manifold pressure-gage	+/- 10%
Exhaust flow	+/- 6%
Specific fuel consumption	+/- 3%
Fuel rate	+/- 5%
Heat rejection	+/- 5%

CONDITIONS:
ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS OF 99 KPA (29.31 IN HG) DRY BAROMETER AND 25 DEG C (77 DEG F) TEMPERATURE. THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND TEMPERATURE AS SHOWN IN SAE J1995.

PERFORMANCE MEASURED USING A STANDARD FUEL WITH FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT 29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.001 LB/US GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE DATA IS CORRECTED TO SAE J1995, ISO 3046-2 & 8665 & 2288 & 9249 & 1585, EEC 80/1269 AND DIN 70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS AND CHARGING ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND OR AMBIENT TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON THE PERFORMANCE DATA SET.

DIESEL INDUSTRIAL PERFORMANCE
ALTITUDE:
ALTITUDE CAPABILITY DATA - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURE.

AMBIENT DATA - THE FLYWHEEL POWER AVAILABLE AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE OPERATION.

STD TEMPERATURE - THE STD TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS FOUND ON TM2001.

DIESEL INDUSTRIAL PERFORMANCE
**********INDUSTRIAL ENGINE 5 TIER DATA SHEET**********

THE FOLLOWING INFORMATION NEEDS TO BE DETERMINED AND ENTERED ON THE DATA SHEET FOR FUTURE USE IN THE TIER AND ENGINE SELECTION PROCESS USING THE SELECTION GUIDE.

* APPLICATION BACKGROUND INFORMATION
FUNCTION OF ENGINE_____
DRIVEN EQUIPMENT DESCRIPTION_____
ESTIMATE OF HOURS PER YEAR OF OPERATION_____
ESTIMATED LOAD FACTOR_____
MAX UNINTERRUPTED TIME AT FULL LOAD_____
TYPICAL OWNERSHIP/PRODUCT LIFE CYCLE_____

ADDITIONAL RESTRICTIONS PER "APPLICATION GUIDELINES"_____

* DETERMINE LOAD & SPEED CYCLE INFORMATION IN AS FINE AN INCREMENT AS POSSIBLE.

POWER (% RATED)	SPEED (% RATED)	TIME (% CYCLE)
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

* DETERMINATION OF THE ENGINE INFORMATION
POWER & SPEED REQUIRED AT FULL LOAD
ASPIRATION DESIRED: NA_____; T_____; TA_____
EXHAUST MANIFOLD TYPE: WC_____; DRY_____
TYPE COOLING: RADIATOR_____ FAN POWER_____
HEAT EXCHANGER_____
COOLING TOWER_____
OTHER_____
AMBIENT CONDITION MODIFIERS: TEMP_____
ALTITUDE_____
PACKAGE SIZE CONSTRAINTS: L_____; W_____; H_____
WEIGHT_____

* IDENTIFY CUSTOMER PREFERENCE ENGINE IF ANY:_____

* FOR ADDITIONAL DATA SHEETS DUPLICATE THIS FORM

DIESEL INDUSTRIAL PERFORMANCE

**********INDUSTRIAL ENGINE SELECTION GUIDE**********

INTRODUCTION

THE FOLLOWING SECTIONS PROVIDE DETAILED INFORMATION ON ANALYZING INDUSTRIAL APPLICATIONS. THE INTENT OF THIS SECTION IS TO PROVIDE SUFFICIENT INFORMATION TO ALLOW DETERMINATION OF THE APPROPRIATE RATING TIER LEVEL AND SELECTION OF AN ACCEPTABLE ENGINE MODEL.

THIS PROCESS INVOLVES A DETAILED ANALYSIS OF THE APPLICATION DUTY CYCLE IN TERMS OF TIME SPENT AT VARIOUS IDENTIFIABLE LOAD CONDITIONS AND TIME SPENT UNDER VARIOUS IDENTIFIABLE SPEED CONDITIONS. A STEP-BY-STEP EXAMPLE DEPICTS HOW THE PROCESS UTILIZES THIS INFORMATION IN TERMS OF LOAD FACTOR AND SPEED FACTOR TO CALCULATE A RATING FACTOR. THE RATING FACTOR CHART ALLOWS THE APPROPRIATE TIER LEVEL TO BE IDENTIFIED AS ONE MAJOR SELECTION CRITERIA.

THE INDUSTRIAL ENGINE SELECTION GUIDE WORKSHEET LEADS THE ANALYST STEP-BY-STEP THROUGH THE DISCOVERY PROCESS USING THE DUTY CYCLE AND OTHER REQUESTED INFORMATION TO SELECT A FINAL TIER LEVEL AND ENGINE CHOICE FOR THE APPLICATION IN QUESTION.

ANY FURTHER INQUIRIES CONCERNING THE UTILIZATION OF THIS PROCESS OR TO PURSUE SITUATIONS THAT DO NOT FIT THIS SELECTION PROCESS SHOULD BE DIRECTED TO THE FACTORY VIA YOUR NORMAL CONTACTS AND PROCEDURES.

LOAD FACTOR

LOAD FACTOR (THE AVERAGE DEMAND ON AN ENGINE) CAN BE DETERMINED THROUGH ACTUAL FUEL CONSUMPTION. IT CAN BE DETERMINED BY DIVIDING THE ACTUAL FUEL USED IN A WORK CYCLE BY THE AMOUNT OF FUEL THAT COULD BE CONSUMED AT THE STATED ENGINE RATING DURING THE SAME TIME PERIOD.

ACTUAL FUEL CONSUMED
(GAL OR L)

_____

RATED FUEL RATE X LENGTH OF WORK CYCLE
(GPH OR L/H) (H)

A MORE PRECISE DETERMINATION OF LOAD FACTOR IS THROUGH DETAILED ANALYSIS OF THE DUTY CYCLE.

DIESEL INDUSTRIAL PERFORMANCE
DUTY CYCLE

A DUTY CYCLE ANALYSIS IS CRITICAL IN THE DETERMINATION OF THE APPROPRIATE RATING TIER. THE DUTY CYCLE IS DEFINED AS THE TIME SPENT AT VARIOUS POWERS AND SPEEDS. IT IS BEST TO DIVIDE THE DUTY CYCLE INTO AS MANY ELEMENTS OF POWER AS POSSIBLE (RATED, %'S OF RATED AND IDLE) AND AS MANY ELEMENTS OF SPEED AS POSSIBLE (RATED, %'S OF RATED, HIGH IDLE, AND LOW IDLE). THESE VALUES ARE USED IN THE CALCULATIONS OF LOAD FACTOR AND SPEED FACTOR. MULTIPLYING THE LOAD FACTOR AND THE SPEED FACTOR TOGETHER RESULTS IN A RATING FACTOR. THIS RATING FACTOR HELPS DETERMINE THE PROPER RATING TIER FOR THIS DUTY CYCLE.

POWER AND SPEED PROFILE FOR DUTY CYCLE

POWER (% RATED)	*	SPEED (% RATED)	*	TIME (% CYCLE)
100	*	100	*	
*		*		
*		*		
LOW IDLE = 10 *		* LOW IDLE = (25-40)**	*	
HIGH IDLE = 10 *		* HIGH IDLE (110)***	*	

* ALL IDLE (LOW & HIGH) POWER IS ASSUMED AS 10% OF RATED POWER
** LOW IDLE SPEED IS USUALLY 25 - 40% OF RATED SPEED
*** HIGH IDLE SPEED IS USUALLY 110% OF RATED SPEED

(EXAMPLE OF A SIMPLE DUTY CYCLE)

POWER (% RATED)	*	SPEED (% RATED)	*	TIME (% CYCLE)
100	*	100	*	50
80	*	85	*	10
50	*	75	*	20
LOW IDLE (10)	*	LOW IDLE (40)	*	10
HIGH IDLE (10)	*	HIGH IDLE (110)	*	10

DIESEL INDUSTRIAL PERFORMANCE
* LOAD FACTOR CALCULATION
LOAD FACTOR = TOTAL OF % POWER X % TIME
1.00 X .50 = .50
.80 X .10 = .08
.50 X .20 = .10
.10 X .10 = .01
.10 X .10 = .01
TOTAL = .70 OR 70% LOAD FACTOR

* SPEED FACTOR CALCULATION
SPEED FACTOR = (TOTAL OF % SPEED X % TIME) SQUARED
1.00 X .50 = .500
.85 X .10 = .085
.75 X .20 = .150
.40 X .10 = .040
1.10 X .10 = .110
TOTAL =(.885) SQUARED = .78 OR 78% SPEED FACTOR

* RATING FACTOR CALCULATION
LOAD FACTOR X SPEED FACTOR = RATING FACTOR

CALCULATION: .70 X .78 = .546 OR .55

RESULT: A .55 RATING FACTOR EQUATES TO A (C) TIER RATING (SEE TIER RATING FACTOR CHART)

SEE PRODUCT NEWS LEXH3256 FOR A DUTY CYCLE DIAGRAM

EXAMPLE OF A COMPLEX DUTY CYCLE

POWER (% RATED)	*	SPEED (% RATED)	*	TIME (% CYCLE)
100	*	100	*	1
70	*	94	*	14
25	*	96	*	8
80	*	75	*	1
55	*	75	*	9
30	*	75	*	10
20	*	53	*	57

DIESEL INDUSTRIAL PERFORMANCE
* LOAD FACTOR CALCULATION
LOAD FACTOR = TOTAL OF % POWER X % TIME
1.00 X .01 = .010
.70 X .14 = .098
.25 X .08 = .020
.80 X .01 = .008
.55 X .09 = .050
.30 X .10 = .030
.20 X .57 = .114
TOTAL = .330 OR 33% LOAD FACTOR

* SPEED FACTOR CALCULATION
SPEED FACTOR = (TOTAL OF % SPEED X % TIME) SQUARED
1.00 X .01 = .010
.94 X .14 = .132
.96 X .08 = .077
.75 X .01 = .008
.75 X .09 = .068
.75 X .10 = .075
.53 X .57 = .302
TOTAL = (.672) SQUARED = .452 OR 45%

* RATING FACTOR CALCULATION
LOAD FACTOR X SPEED FACTOR = RATING FACTOR

CALCULATION: .33 X .45 = .15

RESULT: A .15 RATING FACTOR EQUATES TO A E TIER RATING (SEE TIER RATING FACTOR CHART)

(TIER IDENTIFICATION CHART)
TIER RATING FACTOR CHART

(FACTOR)	(RATING TIER)
1.00	A
.85	B
.65	C
.45	D
.25	E
.10	

DIESEL INDUSTRIAL PERFORMANCE
**********INDUSTRIAL ENGINE SELECTION GUIDE**********

THE FOLLOWING INFORMATION NEEDS TO BE DETERMINED AND ENTERED IN THE SELECTION GUIDE. TO ARRIVE AT THE CORRECT RESULT THE GUIDE SHOULD BE FILLED OUT AND DECISIONS MADE IN THE ORDER PROVIDED. THE FIRST SECTION LEADS TO A DETERMINATION OF AN APPROPRIATE TIER LEVEL FOR THE APPLICATION DEFINED. THE SECOND SECTION LEADS TO A DETERMINATION OF THE CORRECT ENGINE CONFIGURATION FOR THE APPLICATION WITHIN THE TIER LEVEL DETERMINED.

* DETERMINATION OF TIER LEVEL
STEP 1 - APPLICATION BACKGROUND INFORMATION FOR TIER SELECTION REFERENCE:
FUNCTION OF ENGINE_____
DRIVEN EQUIPMENT DESCRIPTION_____
ESTIMATE OF HOURS PER YEAR OF OPERATION_____
ESTIMATED LOAD FACTOR_____
MAX UNINTERRUPTED TIME AT FULL LOAD_____
REFER TO "APPLICATION GUIDELINES" IN TMI FOR REFERENCE
TIER

STEP 2 - DETERMINE LOAD & SPEED CYCLE INFORMATION IN AS FINE AN INCREMENT AS POSSIBLE. CONSTRUCT DUTY CYCLE & CALCULATE "RATING FACTOR" PER TMI.
WORKSHEET:

POWER (% RATED)	SPEED (% RATED)	TIME (% CYCLE)	LOAD FACTOR (% POWER X % TIME)	SPEED FACTOR (% SPEED X % TIME)
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
TOTAL:	_____	_____		

TOTAL SQUARED= _____
POWER FACTOR CALCULATION:
* TOTAL LOAD FACTOR_____X SPEED FACTOR_____= RATING FACTOR_____

COMPARE RATING FACTOR TO TIER RATING FACTOR CHART PER TMI/ PRODUCT NEWS SELECT TIER_____
CONSTRUCT LOAD PROFILE CHART PER TMI/PRODUCT NEWS & COMPARE TO PROFILES IN TMI/PRODUCT NEWS SELECT TIER_____

DIESEL INDUSTRIAL PERFORMANCE
STEP 3 - MAX TIME AT FULL LOAD PER CYCLE_____, ETC.
REFER TO "APPLICATION GUIDELINES" FOR COMPLETE RESTRICTIONS.
SELECT TIER_____
RESULT_____
RESULT - COMPARE TIER DETERMINED & SELECT THE MOST RESTRICTIVE TIER FROM STEPS 2 & 3. THIS TIER WILL BE USED TO SELECT THE ACCEPTABLE ENGINE IN THE ENGINE SELECTION SECTION.

* DETERMINATION OF THE ACCEPTABLE ENGINE
STEP 4 - POWER & SPEED REQUIRED AT FULL LOAD_____
ASPIRATION DESIRED: NA_____; T_____; TA_____
EXHAUST MANIFOLD TYPE: WC_____; DRY_____
TYPE COOLING: RADIATOR_____ FAN POWER_____
HEAT EXCHANGER_____
COOLING TOWER_____
OTHER_____
AMBIENT CONDITION MODIFIERS: TEMP_____
PACKAGE SIZE CONSTRAINTS: L_____; W_____; H_____
WEIGHT_____

RESULT - REFER TO PRICE LIST & TMI AT THE PRESELECTED TIER TO PICK AN ACCEPTABLE ENGINE
(DELIVERABLE POWER AT TIER LEVEL)
SELECT ENGINE_____

STEP 5 - IDENTIFY CUSTOMER PREFERENCE ENGINE IF ANY: _____

* IF POWER NEEDED IS OVER POWER AVAILABLE WITH PREFERENCE ENGINE VERSUS THAT DETERMINED THROUGH THE SELECTION PROCESS THEN ACCEPT THE SELECTED ENGINE OR REQUEST A SPECIAL RATING BY USING THE SPECIAL ENGINE RATING REQUEST (SERR) PROCESS.

FOR ADDITIONAL SELECTION GUIDE WORKSHEETS DUPLICATE THIS FORM.

SOUND DEFINITIONS:

Sound Power : DM8702
Sound Pressure : TM7080

Date Released : 10/04/11
