UNIVERSIDADE DA CORUÑA

CUADERNO 10: DEFINICIÓN DE LA PLANTA PROPULSORA Y SUS AUXILIARES



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PROYECTO:

TÍTULO: <u>Remolcador de puerto de 55 TPF</u>

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PROYECTO REMOLCADOR DE PUERTO

CARACTERÍSTICAS PRINCIPALES

Tiro a punto fijo	55 tn
Eslora total	25 m
Manga de trazado	11,0 m
Puntal a la cubierta principal	5,00 m
Velocidad	10 nudos
Tripulación	6 personas
Autonomía	2.000 millas

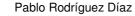
1. INTRODUCCIÓN

El fin del presente cuaderno, es perfilar y definir la cámara de máquinas del buque objeto de este proyecto, cumpliendo los requerimientos tanto de la Sociedad Clasificadora como del SOLAS.

Para tal fin, se procederá a describir detalladamente tanto el equipo propulsor principal, como los servicios y elementos auxiliares, así como su disposición en cámara de máquinas.

Como criterios de diseño de la planta propulsora de un remolcador, no se deberán perder de vista las siguientes características:

- Disponibilidad
- Redundancia
- Maniobrabilidad
- Seguridad



Otros aspectos de importancia a tener en cuenta son:

- El limitado espacio de la cámara de máquinas;
- El nivel máximo de vibraciones que soporta la estructura;
- El buen control de revoluciones; y
- Un deseable bajo nivel de gases de exhaustación

La Cámara de Máquinas se compone de (por duplicado):

- Un motor principal y sus auxiliares (diseñados para trabajar con gasoil)
- Grupo diesel-alternador para la generación de energía eléctrica (para trabajar con gasoil)
- Una unidad azimutal schottel de popa
- Por proa del motor dispondrá de una toma de fuerza con acoplamiento elástico, caja multiplicadora, bomba del equipo Fi-Fi
- Aire comprimido (para el arranque de motores)
- Ventilación y extracción
- Acoplamiento elástico principal
- Ejes intermedios con los cojinetes requeridos y cárdanes
- Grupo de "agua dulce"
- Servicio de combustible
- Engrase y lubricación.

Estos elementos ya no por duplicado:

- Servicios hidráulicos de operación
- Servicios de habilitación
- Local de control

2. JUSTIFICACIÓN Y SELECCIÓN DE MOTORES PRINCIPALES

En los cálculos realizados en el Cuaderno 6 "Predicción de Potencia, Diseño de Propulsores y Timones", se concluyó tal como se introdujo en las necesidades de potencia para cumplir con la condición de 55 T.P.F. superan ampliamente las requeridas para alcanzar la velocidad de 10 nudos; siendo, la primera condición la que prevalecerá a la hora de elegir y justificar los motores adecuados.

La elección de propulsión con motores diesel es la elección más sensata a la vista de los buques de la base de datos, ya que todos utilizan este tipo de propulsión por resultar la más rentable y de menor empacho en un buque de nuestras características. La instalación de turbinas no es viable en un buque de estas características y los motores diesel eléctricos dependen de la planta eléctrica de a bordo, lo que resta fiabilidad frente a un sistema en que los sistemas esenciales de la propulsión están acoplados mecánicamente, por lo que el buque puede navegar sin energía eléctrica principal. Esto es posible gracias a los propulsores Shottel que tampoco dependen de un servomotor eléctrico como en la propulsión convencional.

La elección del combustible Diesel se ha hecho por su menor grado de contaminación, y ya que dentro del rango de potencias en que nos movíamos permitía también la elección de un combustible pesado. Puede ser más caro que el fuel, pero los motores serán lo suficientemente pequeños como para poder admitir esa diferencia entre ambos carburantes. Además el sistema necesario para la calefacción del fuel aumentaría la complejidad de la instalación y su empacho de modo que no resultaría lo más aconsejable.

La potencia necesaria para dar el tiro a punto fijo es de 3300 kW, si dividimos esta potencia entre dos líneas de ejes obtenemos una potencia necesaria por motor de 1650 kW. El motor escogido es un Caterpillar 3512C HD que a 1800 r.p.m. desarrolla una potencia de 2541 bhp. Aunque la potencia es ligeramente superior a la demandada, se quiere asegurar el tiro a punto fijo. Se elige el motor con más próximo a esa potencia pero siempre por encima de ella.

Se adjunta como anexo el Project Guide (Anexo I) de dicho motor con sus características principales así como su croquis.

En la elección de los motores se ha tenido en cuenta:

 Serán motores diesel semi-rápidos de 4 tiempos dada la potencia necesaria que habrán de combinar eficiencia y seguridad con tamaño y peso.

Además:

- 1. El grado de maniobrabilidad y seguridad aumenta ostensiblemente, frente la opción de instalar un solo motor propulsor y/o único eje.
- El buque en proyecto deberá adaptarse y responder de forma adecuada a los dos regímenes de trabajo diferenciados, el remolque y la aproximación al buque averiado. El funcionamiento en carga parcial reducida durante períodos largos es poco recomendable para los grandes motores.
- Atender correctamente la limitación de altura en Cámara de Máquinas. De hecho, al subdividir la potencia, se reduce el volumen unitario ocupado por los motores sobre todo en cuanto a altura.

3. JUSTIFICACIÓN POTENCIA MOTOR PROPULSOR

Para comprobar que la potencia real es la que nos indica el fabricante, calculamos la potencia por cilindro del motor partiendo de la presión media efectiva, el volumen de los cilindros, las revoluciones del motor y de si este es de dos (a=1) o de cuatro tiempos (a=2). Los valores que tenemos son los siguientes:

Volumen cilindro (cm³) = $\pi \cdot D^2 \cdot h/4 = \pi \cdot 17^2 \cdot 21,5/4 = 4880 \text{ cm}^3 = 4,880 \text{ l}$ Volumen total (cilindrada) = $V_{\text{cilindro}} \cdot n_{\text{cilindros}} = 4,880 \text{ 12} = 58,56 \text{ l}$ Presión Media Efectiva (pme) = 20,08 bar BHP_{cil} = N(rpm)·pme(bar)·V_{cil}(cm³) / a·450000 = 196 hp/cil. Potencia total = BHP_{cil}·n_{cilindros} = 195,2·12 = 2351hp = 1753 kw Ligeramente inferior al indicado por el fabricante (1895 kw), aunque superior al requerido y por tanto válido para el buque proyectado.

4. LISTA MAQUINARIA AUXILIAR RELACIONADA CON LA PROPULSIÓN Y OTROS EQUIPOS AUXILIARES

- Reductora
- Servicios de Combustible
- Servicios de Lubricación
- Servicios de Agua Dulce
- Servicios de Agua Salada
- Servicios de Ventilación y Aire de Arranque

4.1 Reductoras

Las reductoras van incorporadas en los propulsores Shottel, de modo que no será necesaria la instalación a bordo y por tanto no se calcularán.

4.2 Servicios de combustible

El servicio de combustible del buque sirve para almacenar y suministrar a los motores el combustible libre de impurezas y en las condiciones óptimas de presión y temperatura.

Este servicio está compuesto de los siguientes elementos principales:

- Toma de combustible en cubierta;
- Nueve tanques almacén;
- Dos tanques de Servicio Diario;
- Una bomba de trasiego;
- Tanque de reboses;
- Bombas de reserva de alimentación del motor principal,
- Separadoras;
- Filtros,
- Tuberías; y

• Válvulas y reguladores de presión.

Tanto motores principales como los auxiliares, utilizan el mismo combustible ligero o destilado pero las líneas de tuberías de ambos se dispondrán de manera independiente.

4.2.1 Servicio de trasiego y purificación

Se compone de los siguientes elementos:

- Tomas de combustible
- Tanques de reboses
- Tanques almacén
- Tanques de servicio diario
- Bomba de trasiego
- Separadora centrífuga
- Filtros dúplex
- Tuberías

4.2.2 <u>Tomas de combustible</u>

La entrada de combustible al buque se realiza mediante dos tomas situadas en cubierta, localizados una a cada banda.

El combustible, pasa a través de un filtro, al piano de válvulas desde dónde se controla a qué tanque irá dirigido. Cada toma de combustible dispone de una bandeja para la recogida de derrames evitando de este modo el vertido accidental al mar de hidrocarburos. De esta bandeja pasan al tanque de reboses.

4.2.3 <u>Tanques</u>

Tres tipos de tanques:

- Tanques de almacenamiento,
- Tanques de servicio diario, y
- Tanque de rebose

Todos los tanques deben disponer de los siguientes elementos que aseguran la eficiencia y seguridad del servicio:

- Tuberías de aireación y aspiración con pantalla antillanas y bandejas de rebose;
- Alarmas de alto y bajo nivel;
- Niveles y mirillas de nivel;
- Registros de purgas empernados; y
- Válvula de cierre rápido.

4.2.4 Tanque de rebose

Los reboses de todos los tanques, las pérdidas en la bomba de alta y el retorno de los inyectores tanto de principales como de auxiliares, van a parar al tanque de reboses.

Además, dicho tanque comunicarán con los de Servicio Diario mediante la bomba de trasiego.

4.2.5 Bomba de trasiego

Dispondremos dos bombas de trasiego, siendo cada una de ellas capaz de llenar los dos tanques de uso diario en 8h, de modo que siempre tendremos una de seguridad en caso de fallo de alguna de ellas.

Volumen a llenar =
$$18,537 \cdot 2 = 37,074 \text{ m}^3$$

Caudal = $37,074 \text{ (m}^3) / 8 \text{ h} = 4,64 \text{ m}^3/\text{h}$

Será una bomba de tornillo. Si estimamos su rendimiento en 0,65 y con una presión de descarga de 3 bar = 30 m.c.a., suficiente para este servicio, la potencia necesaria en el accionamiento será:

$$Pot = \frac{Q(m^3/h) \cdot H(m. c. a.) \cdot \rho(kg/m^3)}{75 \cdot 3600 \cdot \eta}$$
$$Pot = \frac{4,64 \cdot 30 \cdot 850}{75 \cdot 3600 \cdot 0,65} = 0,67hp = 0,50kW$$

4.2.6 Separadora Centrífuga

Dispondremos una separadora con la misma capacidad que las bombas de trasiego, de modo que pudiese ser posible la separación del combustible que se introduce.

Por lo tanto, la separadora tendrá una capacidad de al menos 4 m³/h. Además dispondremos de una de reserva.

4.2.7 Alimentación

Según nos especifica el fabricante del motor en la guía de instalación que se adjunta como Anexo, el motor lleva incluida una bomba de alimentación. Sin embargo, deberemos disponer una bomba de emergencia para cada motor. Su caudal y presión necesaria nos la da también el fabricante del motor. Será una bomba de tornillo, con rendimiento 0,5, y las siguientes características:

Caudal = 1,26 m^3/h

Presión = 4,15 bar = 41,5 mca

$$Pot = \frac{Q(m^3/h) \cdot H(m. c. a.) \cdot \rho(kg/m^3)}{75 \cdot 3600 \cdot \eta}$$
$$Pot = \frac{1,26 \cdot 41,5 \cdot 850}{75 \cdot 3600 \cdot 0,5} = 0,33hp = 0,25kW$$

4.3 Servicio de lubricación

Este servicio es el encargado de proporcionar el aceite lubricante necesario a los motores, para protegerlos de las fricciones excesivas, de las altas temperaturas y de las posibles corrosiones químicas consecuencia de los productos resultantes de la combustión.

Existen otros elementos a bordo como reductoras, bocinas, etc. que también deben ser lubricados, pero al disponer dichos elementos de sus cárteres, la lubricación de cada uno de ellos se hará de manera independiente.

4.3.1 Sistema de lubricación de MMPP y MMAA

Tanto los motores principales como los auxiliares, son de émbolo buzo, por tanto al haber comunicación entre el espacio de cilindros y el cárter, el aceite de camisas y de cojinetes es el mismo. Siguiendo las recomendaciones del fabricante, el aceite utilizado será mineral ligeramente aditivado (SAE 40).

Así en la lubricación de los motores principales podemos distinguir dos subsistemas:

- 1. Sistema de lubricación externo
- 2. Sistema de lubricación interno del motor

4.3.2 Comprobación de Consumos

El consumo de aceite de los motores es de 0,6 g/kWh, según datos del fabricante. El consumo total será:

Consumo aceite =
$$0.6g / kWh \cdot \frac{2000 millas}{10(millas / hora)} \cdot 1895 kW \cdot 10^{-6} = 0.23 t = 0.25 m^3$$

V_{necesario} = $0.25 m^3$

Nuestros tanques son suficientes.

4.3.3 Bombas de Trasiego Aceite

Cada una de las bombas de trasiego de aceite será capaz de llenar el carter del motor (0,625 m³) en media hora. Dispondremos una bomba para cada motor y una de reserva para cada uno. Serán bombas de tornillo con un rendimiento de 0,5 y una presión de descarga de 2 bar.

$$Caudal(Q) = \frac{0,625(m^3)}{0,5h} = 1,25m^3/h$$
$$Pot = \frac{Q(m^3/h) \cdot H(m.c.a.) \cdot \rho(kg/m^3)}{75 \cdot 3600 \cdot \eta}$$
$$Pot = \frac{1,25 \cdot 20 \cdot 920}{75 \cdot 3600 \cdot 0,5} = 0,17hp = 0,13kW$$

4.3.4 Bombas alimentación de aceite

Como ya dijimos, el sistema de alimentación de aceite ya va incorporado en el motor. Sin embargo, debemos disponer una bomba de emergencia para cada motor. Su caudal y su presión de descarga nos las da el fabricante del motor. Será una bomba de tornillo, con rendimiento 0,5, y:

Caudal =
$$50 \text{ m}^3/\text{h}$$

$$Pot = \frac{Q(m^3/h) \cdot H(m.c.a.) \cdot \rho(kg/m^3)}{75 \cdot 3600 \cdot \eta}$$

$$Pot = \frac{50 \cdot 100 \cdot 920}{75 \cdot 3600 \cdot 0.5} = 34hp = 25,41kW$$

4.4 Servicios de agua dulce

El agua dulce se utiliza en el buque, además de para el consumo, como refrigeración para el motor propulsor. En nuestro caso, el sistema de refrigeración de agua dulce se divide en dos circuitos independientes: el circuito de baja y el de alta temperatura.

El circuito de baja temperatura es el encargado de enfriar el aceite de refrigeración en el enfriador del aceite. El de alta es el encargado de la refrigeración de las camisas y las cabezas de los cilindros y de la turbosoplante. El agua del circuito de baja temperatura sale del intercambiador principal, en el que se enfría con agua salada. Del intercambiador pasa a un tanque de expansión y de él impulsada por una bomba pasa al intercambiador de aceite. Tras salir de este, y antes de regresar al intercambiador principal, una parte de esta agua se mezcla con el agua del circuito de alta, disminuyendo su temperatura. El agua de este circuito es impulsada por una bomba, refrigera el bloque motor y la turbo, se mezcla con parte del agua del circuito de alta

Este sistema se llama de "circuito combinado" y permite, además del intercambio de calor en el intercambiador principal, la instalación de un calderín auxiliar como toma de calor para otros servicios.

Se adjunta esquema en el Project Guide.

4.4.1 Bombas de circulación de agua dulce

Aunque el motor principal ya equipa sus propias bombas de circulación debemos disponer una bomba de reserva para cada motor, tanto para el circuito de alta como para el de baja. Las características necesarias de estas bombas nos las da el fabricante en su guía de instalación del motor. Todas



ellas serán bombas centrífugas, cuyos rendimientos se estiman en función del caudal. Las bombas necesarias son las siguientes:

Dos para el circuito de alta:

Presión = 300 kPa = 3 bar

Caudal = 26,1 m^{3}/h

Rendimiento = 0,65

 $Pot = \frac{Q(m^3/h) \cdot H(m.c.a.) \cdot \rho(kg/m^3)}{75 \cdot 3600 \cdot n}$

 $Pot = \frac{26,1 \cdot 30 \cdot 1000}{75 \cdot 3600 \cdot 0.65} = 4,46hp = 3,33kW$

Dos para el circuito de baja:

Presión = 250 kPa = 2,5 bar

Caudal = $52,2 \text{ m}^{3}/\text{h}$

Rendimiento = 0,65

$$Pot = \frac{Q(m^3/h) \cdot H(m. c. a.) \cdot \rho(kg/m^3)}{75 \cdot 3600 \cdot \eta}$$
$$Pot = \frac{52, 2 \cdot 25 \cdot 1000}{52, 25 \cdot 1000} = 7.44hp = 5.55kW$$

$$Pot = \frac{32,2}{75 \cdot 3600 \cdot 0.65} = 7,44hp = 5,5.5$$

4.4.2 Enfriadores

En el manual del motor se muestra el balance térmico del motor, con los correspondientes valores de los calores intercambiados, los caudales, las temperaturas y las presiones en cada uno de los elementos, lo cual se adjunta como anexo.

4.5 Servicio de agua salada

Utilizaremos el agua salada de refrigeración para extraer en el intercambiador, el calor del agua dulce de refrigeración del motor.

4.5.1 Bombas de Agua Salada

Las bombas encargadas de tomar el agua de los colectores e impulsarla a través de los intercambiadores, deberán mover al menos el caudal indicado en

el manual del motor. Dispondremos una bomba de agua salada junto con otra de reserva por cada motor. Sus características serán las siguientes:

Presión = 2 bar
Caudal = 94,5 m³/h
Rendimiento = 0,71

$$Pot = \frac{Q(m^3/h) \cdot H(m.c.a.) \cdot \rho(kg/m^3)}{75 \cdot 3600 \cdot \eta}$$

 $Pot = \frac{94,5 \cdot 20 \cdot 1025}{75 \cdot 3600 \cdot 0,71} = 10,11hp = 7,54kW$

4.5.2 Tomas de mar

Son las encargadas de permitir la toma de agua salada del mar. Deben admitir el caudal máximo del servicio de agua salada, el de contra incendios interior y el de lastre funcionando simultáneamente. Estos caudales son los siguientes:

Caudal Servicio Refrigeración Agua Salada = 94,5 m³/h

• Bombas contra incendios

Al menos, debemos disponer dos bombas. Su caudal total deberá superar en 1/3 el caudal de cada bomba de sentinas para un buque de pasaje de iguales dimensiones, según la regla II-1.21, y nunca superior en total a 180 m³/h, ni cada una con un caudal inferior a 25 m³/h. Estas bombas son del tipo centrífugo. Además, al menos una de las bombas de sentinas será capaz de actuar como bomba contra incendios (en el apartado de sentinas veremos que esto se cumple).

Por lo tanto:

Diámetro (d) colector achique d = $25+1,68 \cdot (L \cdot (B+D)^{1/2})$

 $= 25+1.68 \cdot (25 \cdot (11+5))^{1/2} = 58,6 \text{ mm}$

con (L=eslora entre PP (m), B =manga (m), D= puntal (m))

Capacidad bomba sentinas = $\pi \cdot (d^2/4) \cdot v = 0,005 \text{ m}^3/\text{s} = 19,41 \text{ m}^3/\text{h}$

En esta fórmula, d es el diámetro del colector de sentinas visto antes, en m, y v es la velocidad del agua en el interior de las tuberías, que por problemas de ruidos y cavitación no debe superar los 2 m/s.

Cada bomba de sentinas debe ser capaz de suministrar todo el caudal que permite el colector a esa velocidad.

Capacidad total bombas C.I. = (4/3) Capacidad bomba sentinas = 25,88 m³/h

Ya que vamos a disponer de dos bombas iguales. La presión mínima de estas bombas va a ser de 7 bar, lo que nos aseguraría obtener la presión requerida en cada boca (suponiendo unas pérdidas de carga de más de la mitad de la presión de salida).

La potencia de las bombas seria:

$$Pot = \frac{Q(m^3/h) \cdot H(m.c.a.) \cdot \rho(kg/m^3)}{75 \cdot 3600 \cdot \eta}$$
$$Pot = \frac{25,88 \cdot 70 \cdot 1025}{75 \cdot 3600 \cdot 0,66} = 10,42hp = 7,77kW$$

Por tanto:

Caudal Servicio Contra Incendios Interior = 25,88 m³/h

4.6 Servicios de Ventilación y Aire de Arranque

4.6.1 Aire de Arranque

La capacidad del sistema de aire arranque nos la da la Sociedad de Clasificación, en este caso el DNV-GL. Nos indica que debemos disponer al menos dos botellas de aire comprimido, capaces de realizar al menos 6 arrancadas consecutivas (para motores no reversibles), y además debemos disponer dos compresores como mínimo, uno de ellos, al menos, independiente de los motores principales, y capaces de llenar, cada uno, estas botellas en 1 hora; se entiende por llenado el paso de 0 a 30 bar, es decir, la presión de trabajo.

Según indica el fabricante el volumen de cada una de las botellas para una planta con dos motores, es de 570 l. En el manual del motor se indica así mismo las dimensiones y peso aproximado de dichas botellas (ver página 158 Starting air system design considerations): Número de botellas de aire comprimido = 2 Capacidad = 570 l Longitud = 3470 mm Diámetro = 480 mm Peso aproximado = 320 kg

4.6.2 <u>Compresores de Aire de Arranque</u>

Son necesarios dos compresores, siendo cada uno capaz de llenar las dos botellas en una hora. La capacidad de cada uno de estos compresores se calcula mediante la fórmula que propone el fabricante, en función del volumen total a llenar (página 57 Project guidar):

Caudal =
$$\Sigma V_{\text{botellas}} \cdot 30 = 2 \cdot 0,57 \cdot 30 = 34,2 \text{ m}^3/\text{h}$$

Para el cálculo de la potencia de los compresores suponemos su compresión adiabática (coeficiente k= 1,4) y un rendimiento total η = 0,65.

La fórmula aplicada es la siguiente:

Pot =
$$(k/k-1) \cdot (P_1(bar) \cdot caudal(m^3/h)/27) \cdot [(P_2/P_1)^{(k-1/k)} - 1]/\eta =$$

= $(1,4/0,4) \cdot (1\cdot30/27) \cdot [(34,2/1)^{0.4/1.4} - 1]/0,65 = 10,43 \text{ hp} = 7,77 \text{ kw}$

4.7 Aire de ventilación de Cámara de Máquinas

El aire que debemos introducir en la cámara de máquinas va a ser necesario para distintos usos, que son los siguientes:

- Aire de combustión de motores (propulsores y generadores).
- Aire de evacuación de calor generado por motores y resto de equipos.

El aire necesario se calcula según norma UNE-EN ISO 8861 para "Ventilación de la sala de máquinas de barcos de motor diesel".

4.7.1 Aire de combustión de motores (propulsores y generadores)

La cantidad de flujo de aire para la combustión, q_c, se calcula en metros cúbicos por segundo, de la siguiente forma:

$$q_c = q_{dp} + q_{dg} + q_b$$

- q_{dp} : es el flujo de aire para la combustión de los motores principales diesel, en metro cúbicos por segundo.
- q_{dg} : es el flujo de aire para la combustión de los motores diesel de los generadores, en metros cúbicos por segundo.
- *q_b*: es el flujo de aire para la combustión de las calderas, en metros cúbicos por segundo.
- q_{dp} : es el flujo de aire para la combustión de los motores principales diesel

$$q_{dp} = \frac{P_{dp} \cdot m_{ad}}{\rho} = \frac{(1895 \cdot 2) \cdot 0,0020}{1,13} = 6,71m^3/s$$

 P_{dp} : es la potencia normalizada de servicio de los motores principales diesel a la máxima potencia de salida continua, en kW.

 m_{ad} : es el aire necesario para la cumbistión de los motores diesel, en kg por kw segundo. Para motores de 4 tiempos se puede tomar: 0,0020 kg/(kW·s)

 ρ : 1,13 kg/m³ (es decir, la densidad del aire, a +35°C, 70 RH y 101,3 kPa)

 q_{dg} : es el flujo de aire para la combustión de los motores diesel generadores

$$q_{dg} = \frac{P_{dg} \cdot m_{ad}}{\rho} = \frac{520 \cdot 0,0020}{1,13} = 0.92 \ m^3/s$$

Por lo tanto:

$$q_c = q_{dp} + q_{dg} + q_b = 6,71 + 0,92 + 0 = 7,63 \ m^3/s$$

4.7.2 <u>Aire de evacuación de calor generado por motores y resto de</u> <u>Equipos</u>

$$q_{h} = \frac{\phi_{dp} + \phi_{dg} + \phi_{b} + \phi_{g} + \phi_{el} + \phi_{ep} + \phi_{t} + \phi_{o}}{\rho \cdot c \cdot \Delta t} - 0.4 \cdot (q_{dp} + q_{dg}) - q_{b}$$

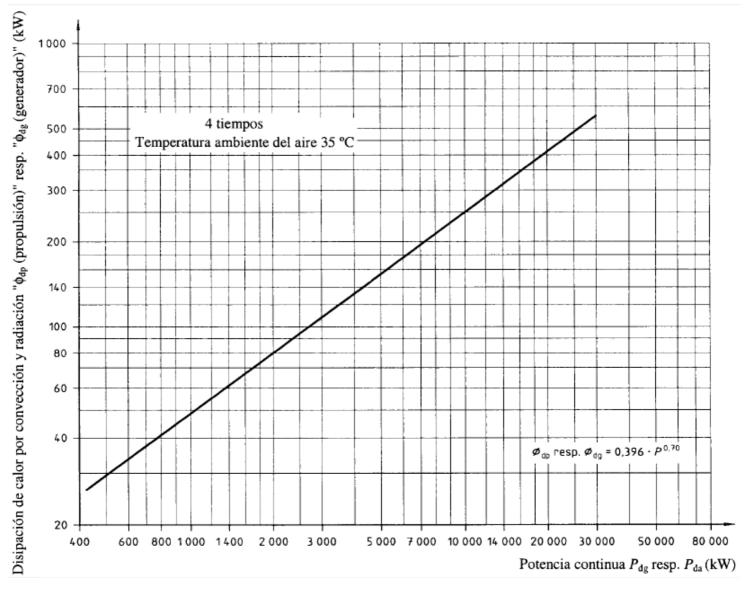
Dónde:

\$\phi_{dp}\$: es la emisión de calor de los motores diesel de propulsión principal, en kW

$$\phi_{dp} = P_{dp} \cdot \frac{\Delta h_d}{100} = 3790 \cdot \frac{3,17}{100} = 120,14 \, kW$$

 P_{dp} : potencia normalizada de servicio de los motores principales diesel de propulsión al máximo régimen continuo, en kW. 1895·2 = 3790kW

 Δh_d : es la pérdida de calor de los motores diesel en porcentaje. Se tomará



Nuestros motores tienen una potencia total de 3790 kW, por lo que disipan aproximadamente 120kW,

UNIVI

$$\Delta h_d = \left(\frac{120}{3790}\right) \cdot 100 = 3,17\%$$

• ϕ_{dg} : es la emisión de calor de los motores diesel generadores, en kW

$$\phi_{dg} = P_{dp} \cdot \frac{\Delta h_{dg}}{100} = 520 \cdot \frac{5,77}{100} = 30 \ kW$$
$$\Delta h_g = \left(\frac{30}{520}\right) \cdot 100 = 5,77\%$$

 φ_b: es la emisión de calor de las calderas y los calentadores de fluido térmico, en kW

$$\phi_b = 0 \, kW$$

• ϕ_p : es la emisión de calor de las tuberías de vapor y condensación, en kW

$$\phi_p = m_{sc} \cdot \frac{\Delta h_p}{100} = 0$$

 φ_g: es la emisión de calor de los generadores eléctricos refrigerados por aire, en kW

$$\phi_g = P_g \cdot \left(1 - \frac{\eta}{100}\right) = 384 \cdot \left(1 - \frac{94}{100}\right) = 23 \ kW$$

Pg: es la potencia de los generadores instalados refrigerados por aire, en kW

 η : rendimiento de los generadores en porcentaje

 \$\phi_{el}\$: es la emisión de calor de las instalaciones eléctricas, en kW

$$\phi_{el} = 0,2 \cdot 2,3 = 0,46 kW$$

$$\phi_{ep} = 0$$

• ϕ_t : es la emisión de calor de los tanques de calefacción, en kW

$$\phi_t = 0$$

• ϕ_0 : es la emisión de calor de otros componentes, en kW

$$\phi_0 = 0$$

 q_{dp}: es el flujo de aire para la combustión de los motores principales diesel principales, en m³/s

$$q_{dp} = 6,71 \, m^3/s$$

 q_{dg}: es el flujo de aire para la combustión de los motores diesel generadores, en m³/s

$$q_{da} = 0,92m^3/s$$

• q_b : es el flujo de aire para combustión de la caldera, en m³/s

$$q_b = 0$$

- ρ : 1,13 kg/m³ (es decir, la densidad del aire, a +35°C, 70 RH y 101,3 kPa)
- c: 1,01 kJ/(kg·K), la capacidad de calor específico del aire
- Δt: 12,5 K, el aumento de la temperatura del aire en la sala de máquinas es decir, la diferencia entre la temperatura de entrada y la de salida medida en las condiciones de diseño. La temperatura de la salida debe medirse a la salida de la sala de máquinas al guardacalor o chimenea sin instalaciones sensibles al calor.

$$q_h = \frac{120, 14 + 30 + 0 + 23 + 0, 46}{1, 13 \cdot 1, 01 \cdot 12, 5} - 0, 4 \cdot (6, 71 + 0, 92) - 0 = 9, 12 \ m^3/s$$

4.7.3 Caudal Total de Aire Necesario

Será el mayor de:

- a. $Q = q_c + q_h = 7,63 + 9,12 = 16,75m^3/s = 60300 m^3/h$
- b. $Q = 1.5 \cdot q_c = 1.5 \cdot 7.63 = 11.45 \, m^3/s$

$Q = 60300 \text{ m}^3/\text{h}$

Aproximadamente el 50% del aire de ventilación se suministrará al nivel de la parte superior de los motores principales diesel de propulsión, cerca de las aspiraciones de la turbosoplante, teniendo cuidado para asegurarse de que el agua de mar no pueda aspirarse de esta toma de aire. Nada de aire se debe proyectar directamente sobre los componentes emisores de calor o directamente sobre aparatos eléctricos o de otro tipo sensibles al agua.

El sistema de evacuación de aire deberá diseñarse para mantener una ligera presión positiva en la sala de máquinas. Esta no deberá exceder de 50 Pa.

Los ventiladores de evacuación se instalarán de tal forma que el aire de evacuación no pueda dirigirse a través de las chimeneas o de las aberturas del extractor.

Para éste volumen de aire necesitamos dos ventiladores de 32.000 m³/h a 45 mm.c.a. El volumen de aire que extraído por los extractores será 7,88 m³/s (28368 m³/h), por lo que se instalarán dos extractores de 14.250 m³/h a 45 mm.c.a.

La potencia se calcula por medio de la misma fórmula usada para las bombas, considerando un rendimiento similar al de las axiales que tomaremos igual a 0,66. Así:

$$Pot = \frac{Q(m^3/h) \cdot H(m. c. a.) \cdot \rho(kg/m^3)}{75 \cdot 3600 \cdot \eta}$$

60300 \cdot 0.045 \cdot 1200

$$Pot = \frac{60300 \cdot 0,045 \cdot 1200}{75 \cdot 3600 \cdot 0,66} = 18,27hp = 13,63kW$$

El aire extraído será:

$$Pot = \frac{28368 \cdot 0,045 \cdot 1200}{75 \cdot 3600 \cdot 0,66} = 8,60 hp = 6,32 kW$$

5. ESTIMACIÓN DEL CONSUMO DEL MOTOR PROPULSOR

Las especificaciones de velocidad se dan al 85 % de la MCR del motor. Según los métodos de predicción de potencia nuestro buque desarrollará los, 10 nudos de velocidad con una potencia de 790 kW. Por lo tanto los motores tendrían que trabajar al 21% (estimamos 50%) para dar la velocidad requerida. Según estos datos, el consumo de nuestro buque en las 2.000 millas de autonomía requeridas será:

Potencia = 50 % MCR = 947,5 kW Consumo motor principal (50% MCR) = 104,9 g/kWh Velocidad = 10 nudos



Autonomía = 2000/10 = 200 h = 8 días

El consumo de los motores será:

Consumo motores = 2.947,5.104,9.10⁻⁶.24 = 4,77 tn/dia

Por otro lado, como se verá en el balance eléctrico, se instalarán dos generadores del modelo Caterpillar C9, capaces de suministrar una potencia de 192 kW cada uno a 1500 rpm, cuyo consumo estimaremos en 3 t/día. Dichos generadores suministran el total de la energía requerida sin sobrepasar el 85% de su potencia, por lo que tendrán un consumo total de:

Consumo generadores = 3 tn/día

Consumo D.O. = 4,77+3 = 7,77 tn/día

Para el consumo total vamos a considerar un margen del 10 % por imbombables (el que queda en el fondo de los tanques que no es utilizable), con lo que el consumo total será:

Consumo total propulsores = 7,77.1,10= 8,547 tn/día

Consumo total propulsores = 8,547.8 = 68,376 tn

El volumen de tanques necesario para alojar dicha cantidad de combustible será, tomando una densidad del diesel de 0,85 t/m³:

 $V_{min \text{ uso diario}} = 8,547/0,85 = 10,06 \text{ m}^3$

 $V_{min total} = 68,376/0,85 = 80,44 \text{ m}^3$

Valor que tomamos de referencia a la hora de diseñar los tanques.

Los tanques que se han diseñado corresponden:

TANQUE	TANQUE APLICACIÓN					
4S-4P	Uso diario	37,074				
2P-2S-7P-7S-12C- 12P-12S-13P-13S	Almacenamiento de combustible	140,306				

Además, como veremos en el balance eléctrico, la planta estará diseñada para ser capaz de suministrar el total de la potencia requerida en la condición de navegación más desfavorable con uno solo de los generadores. La carga máxima de los generadores nunca llegará al 85% utilizado en los cálculos, sino

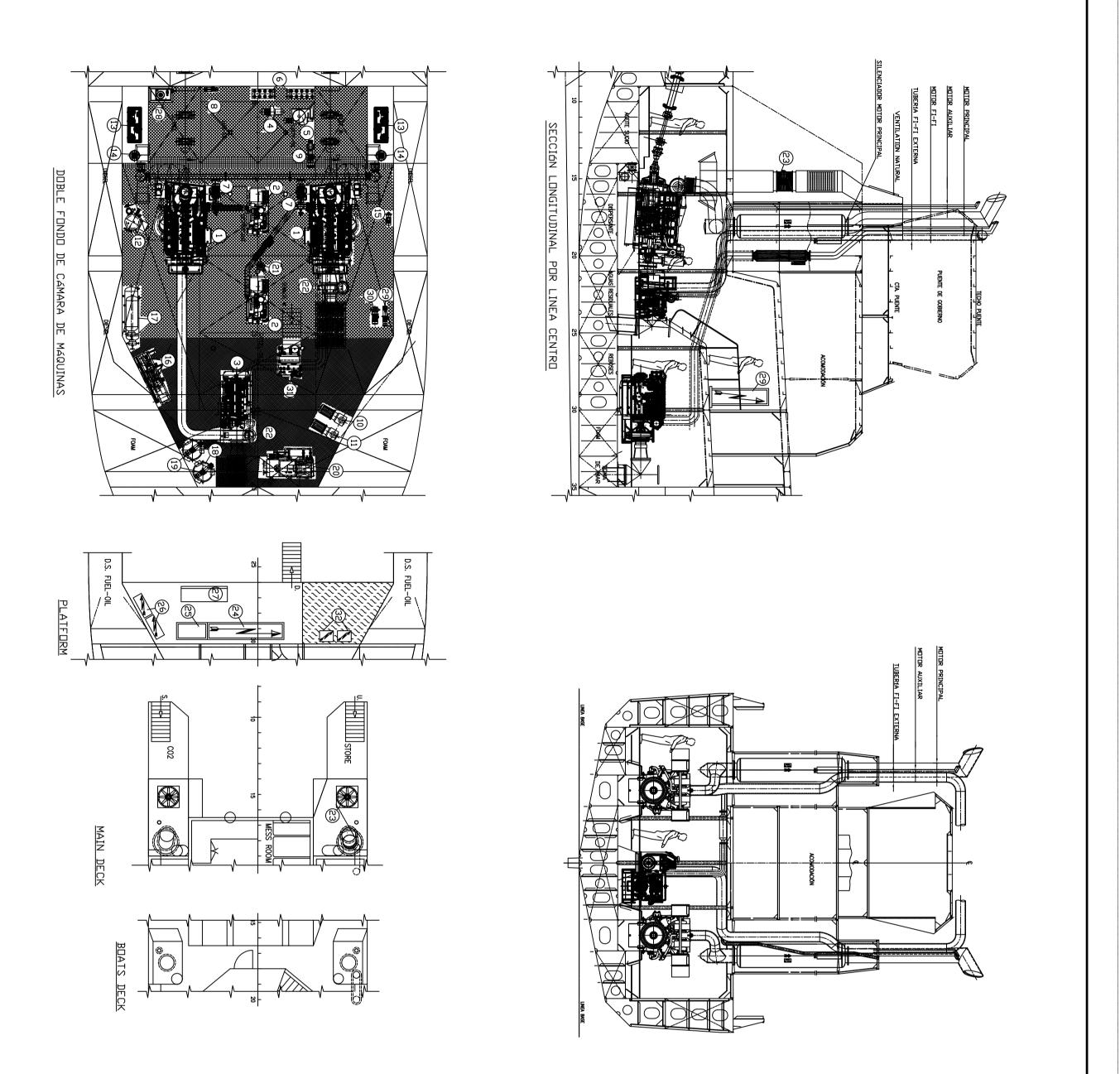


que como máximo funcionarán alrededor del 40% en tareas de remolque y mucho menos en el resto de las condiciones estudiadas, reduciéndose por tanto su consumo a la mitad en el peor de los casos.

Tras todas estas consideraciones se llega a la conclusión de que la capacidad de los tanques es más que suficiente para garantizar el cumplimiento de los requerimientos exigidos, con lo que no tendremos ningún problema en este aspecto.

6. DISPOSICIÓN GENERAL DE CÁMARA DE MÁQUINAS

Por último se muestra un croquis de la disposición general de la cámara de máquinas de nuestro buque, a escala 1:100, donde se muestran las dimensiones aproximadas de los motores, tanto principales como auxiliares, y los distintos equipos que hemos mencionado.



						1																														
PABLO RODRÍGUEZ DÍAZ	AUTOR:	TÍTULO DEL PLANO: DISPOSICIÓN CÁMARA	REMOLCADOR DE PUE	TÍTULO DEL PROYECTO:	UNIVERSIDADE DA CORUÑA GRAI					F.C	J		L.C	1	GENE	R. SER∨	<i>и</i> с	ODL IN	G	AIRE	S4	NITAR	I													
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		MÁQUINAS	DE 55 TPF	_	E.P.S. T GRADO EN PROPULSIÓN Y SERVICIOS N				MOTOR BOMBA FI-FI MOTOR AUXILIAR	BOMBA TRASIEGO DE COMBUSTIBLE	ICADORA DE CO	CAJA DE VALVULAS COMBUSTIBLE	BOMBA TRASIEGO ACEITE	BOMBA DE LODOS	BOMBA DE SERVICIOS GENERALES Y C.I.	SEPARADOR DE SENTINAS BOMBA DE SERVICIOS GENERALES Y C.I.	ENFRIADOR A. DULCE BAJA TEMPERAT.	ENFRIADOR A. DULCE BAJA TEMPERAT.	BOMBA AIRE ACONDICIONADO	PRESOR	GRUPO HIDROFORO A.DULCE Y A.SALADA	≺	A	BUMBA FI-FI RUMBA ACHIONE AGNAS NEGRAS	ELECTROVENTILADOR		INTERROFTURES DE SCHUTTEL	PUPITRE DE CONTROL	<u>-</u>	BOMBA DOSIFICADORA DE DISPERSANTE	BOMBA AGUA SALADA DISPERSANTE	CENTRAL HIDRAULICA MAQUINILLA	TRANSFORMADORES			
PLANO N	ESCALA: 1:1	FECHA: FEE			Trabajo fin de Número:		MARCA Y TIPO	Caterpillar 3512C HD	CATERFILLAR C-18 CATERPILLAR C9	ITUR KF-42	ALFA-LAVAL MAB-104		KF-20	ITUR KF-42 ITUR	ITUR ILNCS-80/200B	ILNCS-80/200B	BLOKSMA PETER TABOADA	BLOKSMA			ITUR	ITUR EZ-2/3	VRX-50/17	HES BOB 250/55 ITUR						ITUR EZ- 3/2	ITUR AU-M2/14					
Nº: 003	1:100 / A2	FEBRERO-2015			DE GRADO		DBSERVACIDNES	2541 C.v. 1.800 r.p.m.	 192 Kw. 1.500 r.p.m.	5 m3/h. 3 bar.		PI-07 FL	2 m3/h. 15 bar.		40 m3/h. 4 bar.	0.5 m3/h. a 10 m3/h. 70 m3/h. 1.5 bar.	K8-62/4P/2P-L=1150	K25/2P/2P-L=1450		30 bar.	200 Lts.	2 m3/h, 2 kar.		1.200 m3/h. × 1.800 r.p.m.	32.000 m3/h.		JUVCCUV CO KVQS.						380/220V 25 Kvas.			

ANEXO I

PROJECT GUIDE MOTOR PRINCIPAL

3500C Marine Project Guide EPA Marine Tier 3 / IMO Tier II Compliant





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Design and Construction Review Checklist

CMPS A&I team would like to recognize Steven Mabey from Finning UK for his contribution to this project guide.

IMPORTANT — PLEASE NOTE:

All dimensions and weights are given as dry weight references only, accurate dimensions and/or weights can be supplied once the engine spec has been defined.

Classification societies requirements that are referred to in the project guide are the typical requirements. These parameters can differ depending on installation type and arrangement. If unsure please consult the customer's classification society to ensure that any engines to be supplied meet the classification society's requirements. It should also be noted that classification societies' requirements are under constant review and are subject to change at any time.

GENERAL

BASIC 3500C DIESEL ENGINE DESIGN

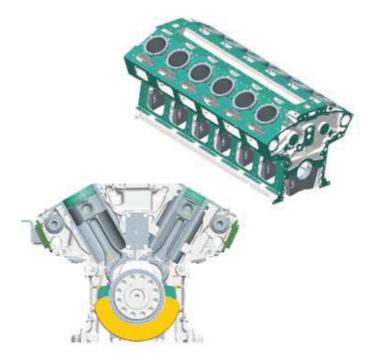
The 3500C engine family for marine applications is a modern, highly efficient, EPA Marine Tier 3, IMO II certified engine series consisting of 12 and 16 cylinder V-engines. These are four stroke, non-reversible engines rated at speeds from 1600 to 1800 rpm and intended for use as main propulsion for vessels. The engines are turbocharged, charge air-cooled and with a direct injection fuel system with electronically controlled injectors. The use of individual fuel injectors eliminates the need for high-pressure piping and provides for an accurate, high injection pressure.

The 3500C platform was designed to meet the following requirements:

- -Emissions flexibility and capability
- -High power density
- -Improved reliability and durability
- -Medium speed BSFC and reliability in a high-speed product

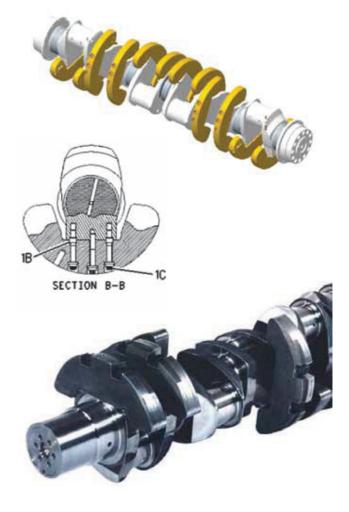
The engine block is made of cast ductile iron for increased strength and stiffness. This increased strength helped produce a higher power-to-weight engine. Coolant supply ducts and main oil galley are integrated into the cylinder block, eliminating parts and leak paths.

The engine block is designed as 60 degree Vee to ensure an ideal balance on the cylinders' performance. It presents dual camshafts and, to increase load capability, two vertical and two horizontal bearing cap fastenings holding the main bearings.



The crankshaft is made of steel forged material. It is a split-pin machined crankshaft to increase power capability. The large bearing journals provide the desired reliability and durability. The crankshaft features induction-hardened fillets and journals.

Its bolt-on counterweights reduce moment of inertia, and its wear-resistant sleeve bearings increase service life.

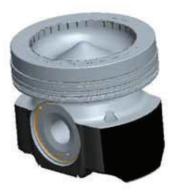


Main and rod bearings have been designed to sustain high loads. The bearing design provides a seizure resistance and tolerance of oil temperatures over a wide range. The Cat[®] 3500C engine's larger rod bearing and main bearing are more scuff and seizure resistant.

Cylinder liners are high-alloy gray iron; centrifugally cast, induction hardened, plateau honed, and water jacketed over their full length. The liners are equipped with an anti-polishing ring (cuff) to avoid piston/liner carbonizing, improving lube oil control and liner life. It is a fully replaceable wet cylinder liner.

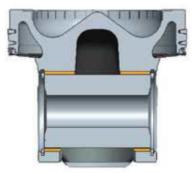


Pistons. The latest generation of 3500s uses a robust steel "Monotherm" piston. It's a two-piece piston with forged steel crown and cast aluminum skirt, sealed by a three-piston ring pack. The C3500 features increased oil flow to pistons for better cooling and allows higher power ratings. Increased oil cooling allows the use of rectangular piston rings that provide a better seal and less motion than the traditional keystone rings. This results in less wear and longer life.



Cylinder head is made of high strength cast iron to get improved durability, allowing high cylinder pressure (increased performance). It is a compact design due to its reverse flow. The mounting of individual cylinder heads promotes easy maintenance.

The intake channel is optimized for low-swirl combustion, which makes it possible to achieve low fuel consumption, low smoke, and low exhaust emissions.



The piston, rod, and liner come out as one assembly, providing faster, easier service. Special tooling is required.





Connecting rods are forged, heat treated, and shot peened before machining. The special four-bolt design allows for an extra-large bearing which reduces bearing load and extends bearing life. The pin bore end taper increases strength in highload areas.



The valve train system is moved back and forth by a dual camshaft outboard of heads (improved access/serviceability). The push rods are made of solid steel, which are linked to floating bridges, simplifying valve lash adjustment. The exhaust rocker is made of forged steel and the intake rocker is made of cast iron.

The 4-valve OHV design results in small packaging and improved serviceability. Mechanically adjusted valve clearance increases valve service intervals.



Valves. The seat on the replaceable inserts is inductionhardened. Positive rotators on all the valves maintain a uniform temperature and wear pattern across the valve face and seat.

Polished **camshaft** lobes and change to radius of curvature account for higher contact stresses driven by increased injection pressures.

Dual turbochargers are mounted on cast pedestals and centerpositioned to eliminate external oil drain lines, reduce the chance of oil leaks, and improve turbo efficiency. The flexible elbow connections used on inlets/outlets of the turbine and compressor housings minimize leakage and provide isolation from external vibrations, motions, and thermal expansion. They are not cooled by water to improve heat rejection and the exhaust gases discharge is conducted in a parallel flow to the turbo. To simplify external piping layout in the engine room, both turbos' flows merge in a single exhaust connection.



IMO II EPA TIER 3 MAIN SPECIFICATIONS							
	3512C	3516C					
Configuration	Vee-12 Cylinder	Vee-16 Cylinder					
Bore x Stroke	170 x 215 mm (8.46 in)	170 x 215 mm (8.46 in)					
Displacement	58.6 L (3,576 in ³)	78.08 L (4,765 in ³)					
Rated Speed	1600 & 1800 rpm	1600 & 1800 rpm					
Aspiration	Turbocharged-Aftercooled	Turbocharged-Aftercooled					
Cooling System	Plate Hex, Keel Cooled	Plate Hex, Keel Cooled					
Refill Capacity – Lube Oil System – Cooling System	613.2 L (162.0 gal) 157 L (41.4 gal)	779.8 L (206.0 gal) 234 L (61.6 gal)					
Oil Change Interval	1000 hours	1000 hours					
Rotation	Counterclockwise	Counterclockwise					
Flywheel and Flywheel Housing	SAE No. 00	SAE No. 00					
Flywheel Teeth	183 Teeth	183 Teeth					
Engine Management System	A4 ECUs	A4 ECUs					
Engine Diagnostic System	Datalink Messaging	Datalink Messaging					

EXAMPLE ENGINE SCOPE OF SUPPLY

The following is a typical scope of supply for a C3500 marine main propulsion engine. This is an example only; the scope of supply varies with the application to meet specific customer needs, based on additional options discussed in the system sections.

Air Inlet System

- Corrosion-resistant separate circuit aftercooler core
- Regular duty air cleaners with service indicator
- Bearing housing mounted dual turbochargers

Communications

• J1939 data link

Cooling System

- Auxiliary fresh water pump (SCAC engines)
- Gear-driven centrifugal jacket water
- Centrifugal non-self priming auxiliary sea water pump
- Engine oil cooler
- Expansion tank
- Electronic thermostats
- Housing
- Two-pass aftercooler as opposed to single-pass aftercooler on 3500B

Engine Control System

- Dual engine control modules (A4 ECU) provide control and monitoring. Better combustion control with crank timing vs. cam timing
- Rigid wiring harness

Exhaust System

- Dry gas-tight exhaust manifolds with thermolaminated heat shields
- Dual turbochargers with thermolaminated heat shields
- Single exhaust outlet

Fuel System

- Electronically controlled unit injectors (MEUI™)
- Fuel filter with service indicators
- Fuel transfer pump

Lube System

- Top-mounted dual crankcase breathers
- Oil filter with service indicators
- Oil level gauge
- Oil filler
- Gear-type oil pump
- Rear-sump oil pump

Mounting System

- Front trunion
- · Rear pads on sides of flywheel housing

Power Take-Offs

- Accessory drives lower RH and lower LH for standard rotation
- Two-sided front housing

Instrumentation

- Engine-mounted instrument panel with Marine Power Display (MPD)
- Four-position engine control switch
- Alarm horn
- Overspeed shutdown notification light
- Emergency stop notification light
- Secondary ECU "Ready" light
- Secondary ECU "Active" light
- Graphic display unit for analog or digital display of oil and fuel pressure
- Oil and fuel filter differential
- System DC voltage
- Exhaust and water temperature
- Air inlet restriction
- Service meter
- Engine speed
- Fuel consumption (total and instantaneous)

PROTECTION SYSTEM

A4 ECU monitoring system provides engine deration, alarm, or shutdown strategies to protect against adverse operating conditions. Selected parameters are customer programmable. Initially set as follows:

Safety Shutoff Protection – electrical:

- Oil pressure
- Water temperature
- Overspeed
- Crankcase pressure
- Aftercooler temperature
- Air inlet shutoff activated on overspeed or emergency stop (optional)
- Oil pressure and water temperature (non-redundant, uses OP and WT sensors)
- Overspeed (redundant and independent of engine governing system)

Alarms – electrical:

- ECU voltage
- Oil pressure
- · Water temperature (low and high)
- Overspeed
- Crankcase pressure
- Aftercooler temperature low water level (sensor is optional attachment)
- Air inlet restriction
- Exhaust stack temperature
- · Filter differential pressure (oil and fuel)

Derate – electrical:

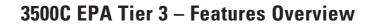
- High water temperature
- Crankcase pressure
- Aftercooler temperature
- Air inlet restriction
- Altitude
- Exhaust temperature
- Alarm switches (oil pressure and water temperature), for connection to customer-supplied alarm panel

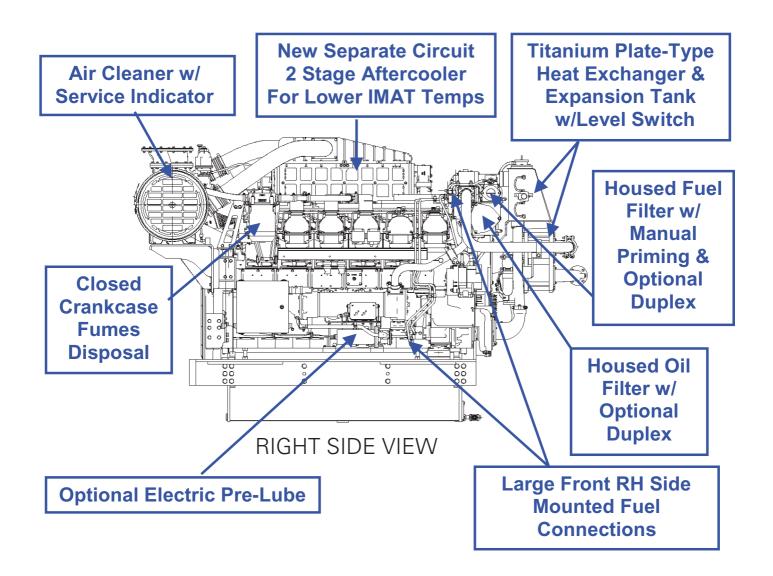
General

- Vibration damper and guard
- Caterpillar yellow paint
- Lifting eyes

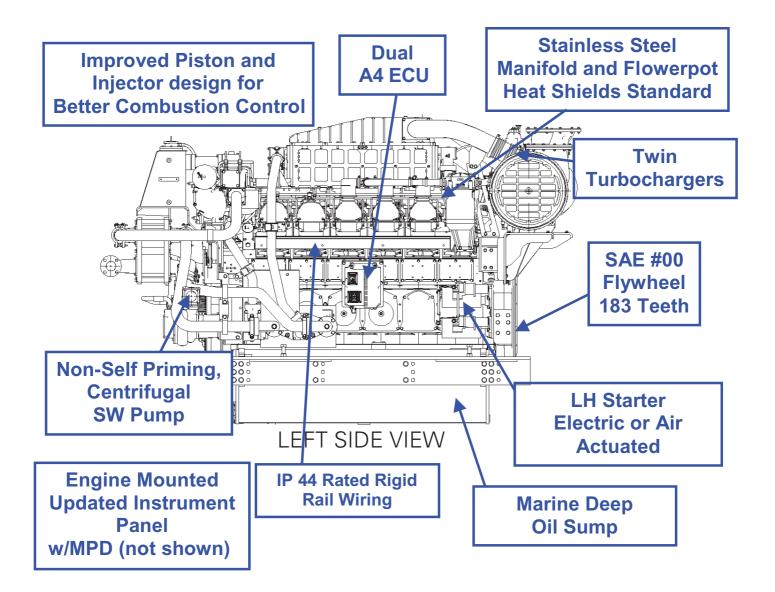
Optional Equipment

- Cat engine-mounted plate-type heat exchanger with integrated fuel cooler
- Pilot house panel with Marine Power Display (MPD), remote start/stop, remote E-stop, remote alarm display, remote override
- Special appearance package with chrome plated covers
- Deep sump oil pan
- High capacity SW pump
- Spare parts kit









RATINGS

3512C PROPULSION ENGINES

A RATING (UNRESTRICTED CONTINUOUS)					
Engine Model 3512C					
Rated Speed (rpm)	1600	1800			
Rated Power (bkW)	1381	1381			
Rated Power (bhp)	1851	1851			
Max. Air Temp. to Air Filters – °C (°F)	45°C (113°F)	45°C (113°F)			
LTC Water Temp. Engine in (Max.) – °C (°F)	50°C (122°F)	35°C (95°F)			
HTC Cooling Water Temp Engine Out – °C (°F)	89°C (192°F)	89°C (192°F)			

The above ratings are based on the following approximate load profile:

- For vessels operating at rated load and rated speed up to 100% of the time without interruption.
- Typical applications could include but are not limited to vessels such as freighters, tugboats, bottom drag trawlers, or deep river boats.
- Typical operation ranges from 5000 to 8000 hours per year.

B RATING (HEAVY DUTY)					
Engine Model 3512C					
Rated Speed (rpm)	1600	1800			
Rated Power (bkW)	1425	1678			
Rated Power (bhp)	1911	2250			
Max. Air Temp. to Air Filters – °C (°F)	48°C (118°F)	45°C (113°F)			
LTC Water Temp. Engine in (Max.) – °C (°F)	35°C (95°F)	43°C (109°F)			
HTC Cooling Water Temp Engine Out – °C (°F)	89°C (192°F)	89°C (192°F)			

The above ratings are based on the following approximate load profile:

- 80% of the engine operating hours at 100% of rated power.
- 20% of the engine operating hours with some load cycling (40% to 80% load factor).
- Typical applications could include but are not limited to vessels such as mid-water trawlers, purse seiner, crew and supply boats, ferries, or towboats.
- Typical operation ranges from 3000 to 5000 hours per year.

C RATING (MAXIMUM CONTINUOUS)						
Engine Model 3512C						
Rated Speed (rpm)	1600	1800				
Rated Power (bkW)	1500	1765				
Rated Power (bhp)	2012	2365				
Max. Air Temp. to Air Filters – °C (°F)	45°C (113°F)	45°C (113°F)				
LTC Water Temp. Engine in (Max.) – °C (°F)	35°C (95°F)	43°C (109°F)				
HTC Cooling Water Temp Engine Out – °C (°F)	89°C (192°F)	89°C (192°F)				

The above ratings are based on the following approximate load profile:

- 50% of the engine operating hours at 100% of rated power.
- 50% of the engine operating hours with some load cycling (20% to 80% load factor).
- Typical applications could include but are not limited to vessels such as ferries, harbor tugs, fishing boats, offshore service boats, displacement hull yachts, or short trip coastal freighters.
- Typical operation ranges from 2000 to 4000 hours per year.

3516C PROPULSION ENGINES

A RATING (UNRESTRICTED CONTINUOUS)					
Engine Model	351	16C			
Rated Speed (rpm)	1600	1800			
Rated Power (bkW)	1825	—			
Rated Power (bhp)	1851	—			
Max. Air Temp. to Air Filters – °C (°F)	45°C (113°F)	_			
LTC Water Temp. Engine in (Max.) – °C (°F)	35°C (95°F)	—			
HTC Cooling Water Temp Engine Out – °C (°F)	89°C (192°F)	—			

The above ratings are based on the following approximate load profile:

- For vessels operating at rated load and rated speed up to 100% of the time without interruption.
- Typical applications could include but are not limited to vessels such as freighters, tugboats, bottom drag trawlers, or deep river boats.
- Typical operation ranges from 5000 to 8000 hours per year.

B RATING (HEAVY DUTY)					
Engine Model	351	16C			
Rated Speed (rpm)	1600	1800			
Rated Power (bkW)	1920	2240			
Rated Power (bhp)	2575	3004			
Max. Air Temp. to Air Filters – °C (°F)	50°C (122°F)	50°C (122°F)			
LTC Water Temp. Engine in (Max.) – °C (°F)	45°C (113°F)	43°C (109°F)			
HTC Cooling Water Temp Engine Out – °C (°F)	89°C (192°F)	89°C (192°F)			

The above ratings are based on the following approximate load profile:

- 80% of the engine operating hours at 100% of rated power.
- 20% of the engine operating hours with some load cycling (40% to 80% load factor).
- Typical applications could include but are not limited to vessels such as mid-water trawlers, purse seiner, crew and supply boats, ferries, or towboats.
- Typical operation ranges from 3000 to 5000 hours per year.

C RATING (MAXIMUM CONTINUOUS)						
Engine Model	351	16C				
Rated Speed (rpm)	1600	1800				
Rated Power (bkW)	2000	2350				
Rated Power (bhp)	2682	3151				
Max. Air Temp. to Air Filters $-$ °C (°F)	50°C (122°F)	50°C (122°F)				
LTC Water Temp. Engine in (Max.) – °C (°F)	45°C (113°F)	43°C (109°F)				
HTC Cooling Water Temp Engine Out – °C (°F)	89°C (192°F)	89°C (192°F)				

The above ratings are based on the following approximate load profile:

- 50% of the engine operating hours at 100% of rated power.
- 50% of the engine operating hours with some load cycling (20% to 80% load factor).
- Typical applications could include but are not limited to vessels such as ferries, harbor tugs, fishing boats, offshore service boats, displacement hull yachts, or short trip coastal freighters.
- Typical operation ranges from 2000 to 4000 hours per year.

D RATING (INTERMITTENT DUTY)

Engine Model	351	16C
Rated Speed (rpm)	1600	1800
Rated Power (bkW)	_	2525
Rated Power (bhp)		3386
Max. Air Temp. to Air Filters – °C (°F)	_	50°C (122°F)
LTC Water Temp. Engine in (Max.) – °C (°F)		35°C (95°F)
HTC Cooling Water Temp Engine Out – °C (°F)		89°C (192°F)

The above ratings are based on the following approximate load profile:

- 16% of the engine operating hours at 100% of rated power.
- 84% of the engine operating hours with some load cycling (up to 50% load factor).
- Typical applications could include but are not limited to vessels such as ferries, harbor tugs, fishing boats, offshore service boats, displacement hull yachts, or short trip coastal freighters.
- Typical operation ranges from 1000 to 3000 hours per year.

Ratings are based on SAE J1228 standard conditions of 29.61 in Hg (100 kPa) and 77°F (25°C). These ratings also apply at ISO3046-1:2002E, ISO8665, DIN6271-3, and BS5514 conditions of 29.61 in Hg (100 kPa), 81°F (27°C), and 60% relative humidity.

Caterpillar maintains ISO9001:2000 certified quality management systems for engine test facilities to assure accurate calibration of test equipment. Electronically controlled engines are set at the factory at the advertised power corrected to standard ambient conditions. The published fuel consumption rates are in accordance with ISO3046-1:2002E.

Fuel rates are based on fuel oil of 35° API [60°F (16°C)] gravity having an LHV of 18,390 Btu/lb (42 780 kJ/kg) when used at 85°F (29°C) and weighing 7.001 lbs/U.S. gal (838.9 g/liter).

Additional ratings may be available for specific customer requirements. Consult your Cat representative for additional information.

MATCHING OF PROPELLERS AND WATER JETS

Controllable Pitch (CP) propellers are normally designed so that 90 to 100% of the rated power is used when the ship is on trial at a specified speed and load. Overload protection or load control is necessary to protect the engine from overload in the event of heavy vessel loading weather conditions, sea state, or hull fouling.

Water jets approximate a fixed pitch propeller demand curve and can also be affected by vessel loading, weather conditions, sea state, and hull fouling. The water jet power demand should be matched so these conditions do not result in engine overload. The water jet-to-engine match should be based on expected heavy ship conditions, propulsion system power losses, reduction gear losses, etc.

SYSTEM RESPONSE

The water jet should be matched to the engine so the engine can smoothly reach its rated speed in a time frame that optimizes acceleration and fuel combustion (smoke). This optimized condition is frequently programmed into the electronic governing system and the water jet should not inhibit the programmed acceleration rate. An oversized water jet may result in engine lug (maximum fuel at less than rated rpm), resulting in owner dissatisfaction with vessel performance, as well as possible harm to the engine from excessive exhaust temperatures.

ENGINE AND WATER JET TOLERANCES

Engine and water jet tolerances should be taken into account in the propulsion system design. Water jets typically have a rated speed tolerance of +/- 0.5% to +/- 1.5%. Thus, the water jets will absorb the rated power somewhere within this speed band tolerance. If the situation arises where the water jet is supplied within these specifications, but at the lower limit of the speed tolerance, it could mean that the propeller demand would require 4.5% more power at the nominal rated speed. If the water jet is supplied with the ability to absorb the power only at the upper limit of the speed tolerance, the engine may not be able to pull the rated power out of the water jet, as the engine may not be able to operate at this higher rpm. The 3500C tolerances provide nominal power +/- 3% with a rated speed tolerance of + 0.5% to - 1.0%.

REQUIREMENTS/CONDITIONS:

- 1. The dynamometer test results at fuel stop power will be used as the criteria for evaluating installed engine power.
- 2. ISO standard reference conditions apply for power, not site conditions.
- 3. Minimum power setting (no negative tolerance in the Dyno) will be driven by the quoter including the associated additional cost.
- 4. The minimum tolerance on engine power in the Dyno will be reduced to 2%.
- 5. A tolerance of +/- 3.0% applies to engine power in the field based on standard conditions.
- 6. The standard rated power and speed will not be changed on the new nameplate, only the fuel setting.
- 7. Maximum power tolerance limits at rated speed.

WATER JET TOLERANCES

Standard water jet tolerances are +/- 1.5% speed at rated power. This speed tolerance is a function of the pump design, hull form, vessel speed and water jet intake design. The engine speed tolerance at rated power is less than the water jet tolerance (+0.5%/-1.0% versus +/- 1.5%). This means there is a possibility for the water jet to be oversized or undersized if the maximum minus or plus speed tolerance on the water jet is obtained at rated power.

An oversized water jet will cause the engine to operate at fuel stop rack (lug) when the engine is set for the rated 2551 bkW at 1800 rpm. The engine speed may be less than the minimum 1782 rpm (-1.0% engine speed tolerance) required to obtain power within the minus tolerance band with factory rack setting. The engine can operate in lug continuously down to 1500 rpm. However, the engine power output will be out of the minus tolerance band.

An undersized water jet will prevent the engine from reaching rated power at the rated 1800 rpm. Engine speed may be increased to a maximum of 1980 rpm but power output may still be below the minimum tolerance.

To minimize the possibility of a significantly oversized water jet, the customer and/or jet manufacturer may choose to use a different nominal jet sizing point than the rated engine operating point (2525 bkW at 1800 rpm). By choosing a lower nominal water jet rating at 1800 rpm, the jet speed tolerance band may be made to fall entirely within the engine limits such that continuous lug operation is not possible.

TECHNICAL DATA

3500C TECHNICAL DATA SHEETS

The following technical data sheets represent the latest available 3500C engine series technical information at the time of publication and are subject to change. Consult with a Cat dealer to obtain the most current data. The data sheets are organized in the order of engine power ratings (lowest to highest) with propulsion ratings listed first showing the technical data sheets, followed directly by the diesel engine technical data sheets (or performance DM# data sheets) which indicate the performance curve data.

TECHNICAL DATA – 3512C RATING A

	GENER	AL DATA					
		Units 1600 rpm Performance DM# DM8966-00				rpm 129-00	
Engine Output (IMO Certified)	bkW	(bhp)	1380	(1851)	1230	(1649)	
Cylinder Bore	mm	(in)	170	(6.7)	175	(6.9)	
Stroke	mm	(in)	215	(8.5)	220	(8.7)	
Displacement/Cylinder	L	(in³)	78.1	(4765)	84.7	(5167)	
Configuration		6	0V-16, 4-Strok	ke-Cycle-Dies	el		
Aspiration		Twin Turbocharged-Aftercooled					
Cooling			Jacket Wa	ter & SCAC			
Refill Capacity – Lube Oil System	L	(gal)	625	(165)	625	(165)	
Refill Capacity – Cooling System	L	(gal)	157	(41)	157	(41)	
Oil Change Interval		1000 hrs					
Rotation (from flywheel end)		Counterclockwise					
Flywheel and Flywheel Housing			SAE	No. 00			
Flywheel Teeth			1	83			
Governor			A4	ECU			
Fuel System Type			Μ	EUI			
Compression Ratio			14	.7:1			
High Idle Speed	r	ст	17	/30	19	44	
Low Idle Speed (programmable)	r	om	6	00	60	00	
Max. Torque at Max. Torque Speed (1100 rpm/1400 rpm)	N∙m	(lb-ft)	11971	(1829)	8200.00	(6048)	
Length	mm	(in)	3232	(127)	4515	(178)	
Width	mm	(in)	2160	(85)	1857	(73)	
Height	mm	(in)	2205	(87)	2453	(97)	
Weight (approx)	kg	(lb)	7539	(16621)	13041	(28750)	
BMEP @ 100% Load	bar	(psi)	17.7	(256)	15.9	(230)	
Mean Piston Speed	m/s	(ft/s)	11.4	(37.3)	12.8	(42.1)	
Time Before Overall (main)	h	irs		22,	500		
Firing Order – CCW			1-12-9-4-5-8	-11-2-3-0-7-6			

COMBUSTION AIR SYSTEM ¹								
	Units 1600 rpm 1800 rpm Performance DM# DM8966-00 DM8429-00							
Air Filter Restriction, New/Maximum	kPa	(in H ₂ O)	3.72/6.22	(14.9/24.9)	3.72/6.22	(14.9/24.9)		
Inlet Air Pressure	mm Hg	(in Hg)	775	(31)	775	(31)		
Ambient Air Temp. @ Air Cleaner, Maximum	°C	(°F)	50	(122)	50	(122)		
Air Flow Rate @ 100% Load (25°C, 101.3 kPa)	m³/min	(ft³/min)	132	(4,650)	125	(4,399)		

EXHAUST GAS SYSTEM							
Units 1600 rpm Performance DM# DM8966-00						rpm 129-00	
Exhaust Temp to Turbo @ 100% Load	°C	(°F)	541	(1007)	504	(940)	
Exhaust Gas Flow @ 100% Load, Stack Temp & 101.3 kPa ²	m³/min	(ft³/min)	125	(4,414)	119	(4,187)	
Exhaust System Backpressure, Maximum	kPa	(in H ₂ O)	6.7	(27)	6.7	(27)	

HEAT BALANCE @ 100% LOAD AND 25°C AIR ¹							
	Units Performance DM#) rpm 966-00		rpm 129-00	
Jacket Water Overall	kW	(Btu/min)	512	(29,100)	489	(27,821)	
Atmosphere	kW	(Btu/min)	110	(6,274)	94	(5,339)	
Exhaustion ³	kW	(Btu/min)	1098	(62,460)	955	(54,332)	
Exhaustion Recovery	kW	(Btu/min)	480	(27,277)	379	(21,539)	
Oil Cooler	kW	(Btu/min)	174	(9,879)	155	(8,840)	
From Aftercooler	kW	(Btu/min)	377	(21,430)	340	(19,339)	
Work Energy	kW	(Btu/min)	1379	(78,422)	1230	(69,977)	
Low Heat Value Energy	kW	(Btu/min)	3262	(185,481)	2918	(165,964)	
High Heat Value Energy	kW	(Btu/min)	3474	(197,584)	3109	(176,793)	

FUEL SYSTEM							
	Units Performance DM#						rpm 29-00
Fuel Rail Pressure Nominal @ 100% Load	kPa	(psi)	455	(66)	510	(74)	
Max Fuel Flow to Transfer Pump (to engine)	Lpm	(gph)	21	(332)	21	(333)	
Max Allow Fuel Supply Line Restriction	kPa	(in Hg)	30	(8.9)	30	(8.9)	
Inlet Fuel Temperature	°C	(°F)	30.0	(86.0)	30.0	(86.0)	
Max Allow Fuel Temp from Transfer Pump In	°C	(°F)	66.0	(151.0)	66	(151.0)	
Max Fuel Flow to Return Line (from engine)	L/hr	(gph)	1220	(322.3)	1220	(322.3)	
Max Fuel Flow Return Line Restr.	kPa	(in Hg)	27.0	(8.0)	27.0	(8.0)	
Normal Fuel Pressure – Clean System	kPa	(psi)	415	(60.2)	415	(60.2)	
BSFC @ 100% Load ⁴	g/bkW-hr	(lb/bhp-hr)	198.9	(0.327)	199.5	(0.328)	

LUBRICATING OIL SYSTEM									
	Units Performance DM#			rpm 966-00	1800 rpm DM8429-00				
Recommended Oil Type		CAT ECF-1							
Oil Filter Type		Full-Flow							
Crankcase Ventilation Type		Closed Crankcase Ventilation							
Nom Oil Pressure w/SAE 10W30 Oil @ 99°C	kPa	(psi)	610	(88.5)	610	(88.5)			
Min LI Op w/SAE 10W30 Oil @ 99°C	kPa	(psi)	300	(43.5)	300	(43.5)			
Maximum Allowable Oil Temp	٥c	(°F)	107	(226.0)	107	(226.0)			
Lube Oil Pressure, Nominal	kPa	(psi)	379	(55.0)	406.0	(59.0)			
Lube Oil Pressure Low Idle	kPa	(psi)	241	(35.0)	248.0	(36.0)			
Sump Capacity	L	(gal)	613.2	(162)	613.2	(162)			

COOLING WATER SYSTEM – HTC (ENGINE JACKET WATER)							
		nits Ince DM#	1600 rpm DM8966-00		1800 rpm DM8429-00		
HTC Cooling Water Temperature Engine Out (nominal)	°C	(°F)	99	(210)	99	(210)	
HTC Cooling Water Refill Capacity (engine only)	L	(gal)	157	(41)	157	(41)	
Engine & Expansion Tank Coolant Capacity	L	(gal)	291.5	(77)	291.5	(77)	
Coolant Medium		Caterpilla	r Extended Lif	e Coolant (EL(C) or Equal		
Expansion Tank Pressure Cap	kPa	(psi)	96.5	(14)	96.5	(14)	
Regulator Location			Ou	tlet			
Maximun Uninterrupted Fill Rate	L/min	(gal/min)	18.9	(5)	18.5	(5)	
Regulator Start-to-Open Temperature	°C	(°F)	90	(195)	88	(190)	
Temp Jacket Water Pump Inlet (nominal)	°C	(°F)	89	(192)	89	(192)	
Temp Jacket Water Pump Inlet (max)	°C	(°F)	92	(197)	92	(197)	
Temp Jacket Water Pump Inlet (min)	°C	(°F)	83	(183)	83	(183)	
Delta T Jacket Water (out-in)	°C	(°F)	5.0	(9)	5.0	(9)	
Min Allowable Jacket Water Coolant Flow	L/min	(gal/min)	1204.0	(317)	1204.0	(317)	
Max Allowable Jacket Water Coolant Flow	L/min	(gal/min)	1808.0	(476)	1808.0	(476)	
Jacket Water Coolant Flow (nominal)	L/min	(gal/min)	1400.0	(368)	1400.0	(368)	

COOLING WATER SYSTEM – LTC (AFTERCOOLER)								
		nits Ince DM#) rpm 966-00	1800 rpm DM8429-00			
LTC Water Temperature Engine in (max) ⁵	°C	(°F)	32	(91)				
Coolant Medium	Caterpillar Extended Life Coolant (ELC) or equal							
Expansion Tank Pressure Cap	kPa	(psi)	96.5	(14)	96.5	(14)		
Min Allowable Aftercooler Coolant Flow	L/min	(gal/min)	722	(190)	387	(102)		
Max Allowable Aftercooler Coolant Flow	L/min	(gal/min)	965	(254)	437	(115)		
Aftercooler Coolant Flow (nominal)	L/min	(gal/min)	580	(153)	435	(115)		

STARTING SYSTEM							
		nits ance DM#		600 rpm 1800 rpm 18966-00 DM8429-00			
Minimum Cranking Speed Required for Start	rŗ	rpm		0.0	12	0.0	
Lowest Ambient Start Temp w/o Aids	0°	°F	0.0	(32)	0.0	(32)	

	TOLERENCES		
	Units Performance DM#	1600 rpm DM8966-00	1800 rpm DM8429-00
Engine Power	+/- 3%	Specific Fuel Consumption	+/- 3%
Heat Rejection JW (block)	+/- 10%	BSFC ISO 3046/1	+ 5% / - 0%
Heat Rejection SCAC	+/- 5%	Heat Rejection Oil Cooler (OC)	+/- 20%
Heat Rejection Radiant	+/- 50%	Exhaust Stack Temperature	+/- 8%
Charge Air Pressure	+/- 10%	Fuel Rate	+/- 5%
Exhaust Flow	+/- 5%	Inlet Air Flow	+/- 5%

Notes:

¹ Air flows are shown for 25°C air inlet to the turbocharger and 43°C (109°F) cooling water to the charge air cooler. Adjust aftercooler heat load for higher ambients using the Aftercooler Heat Rejection Factors.

² 32°F and 29.98 in Hg

³ Exhaust heat rejection is based on fuel LHV to 25°C and is not normally recoverable in total

⁴ At 100% loads with pumps +/- 3% except where specified differently. Performance and fuel consumption are based on 35 API, 16°C fuel having a lower heating value of 42,780 kJ/kg used at 29°C with a density of 838.9 g/liter. Does not include sea water pump parasitic load.

⁵ Sizing point with 27°C sea water

TECHNICAL DATA – 3512C RATING C

	GENER	AL DATA							
		nits ance DM#				800 rpm 19245-02			
Engine Output (IMO Certified)	bkW	(bhp)	1500	(2012)	1764	(2366)			
Cylinder Bore	mm	(in)	170	(6.7)	175	(6.9)			
Stroke	mm	(in)	215	(8.5)	220	(8.7)			
Displacement/Cylinder	liters	(in³)	78.1	(4765)	84.7	(5167)			
Configuration		6	0V-16, 4-Strol	ke-Cycle-Dies	el				
Aspiration		Τv	vin Turbochar	ged-Aftercool	ed				
Cooling			Jacket Wa	ter & SCAC					
Refill Capacity – Lube Oil System	L	(gal)	625	(165)	625	(165)			
Refill Capacity – Cooling System	L	(gal)	157	(41)	157	(41)			
Oil Change Interval		1000 hrs							
Rotation (from flywheel end)		Counterclockwise							
Flywheel and Flywheel Housing		SAE No. 00							
Flywheel Teeth			1	83					
Governor			A4	ECU					
Fuel System Type			М	EUI					
Compression Ratio			14	.7:1					
High Idle Speed	r	pm	17	/30	19	944			
Low Idle Speed (programmable)	r	pm		60	00				
Max. Torque at Max. Torque Speed (950/1100 rpm)	N∙m	(lb-ft)	12099	(8925)	12000	(8851)			
Length	mm	(in)	3232	(127)	4515	(178)			
Width	mm	(in)	2160	(85)	1857	(73)			
Height	mm	(in)	2205	(87)	2453	(97)			
Weight (approx)	kg	(lb)	7539	(16621)	13041	(28750)			
BMEP @ 100% Load	bar	(psi)	19.2	(279)	20.1	(291)			
Mean Piston Speed	m/s	(ft/s)	11.4	(37.3)	12.8	(42.1)			
Time Before Overall (main)	ł	nrs		22,	500				
Firing Order – CCW			1-12-9-4-5-8-	11-2-3-10-7-6					

COMBUSTION AIR SYSTEM ¹									
		nits Ince DM#) rpm 255-01		rpm 245-02			
Air Filter Restriction, New/Maximum	kPa	(in H ₂ O)	3.72/6.22	(14.9/24.9)	3.72/6.22	(14.9/24.9)			
Inlet Air Pressure	mm Hg	(in Hg)	775	(31)	775	(31)			
Ambient Air Temp. @ Air Cleaner, Maximum	°C	(°F)	50	(122)	50	(122)			
Air Flow Rate @ 100% Load (25°C, 101.3 kPa)	m³/min	(ft³/min)	136	(4799)	164	(5,802)			

EXHAUST GAS SYSTEM									
		iits ince DM#	1600 DM92	rpm 255-01	1800 rpm DM9245-02				
Exhaust Temp to Turbo @ 100% Load	°C	(°F)	565	(1050)	557	(1135)			
Exhaust Gas Flow @ 100% Load, Stack Temp & 101.3 kPa ²	m³/min	(ft³/min)	129	(4,570)	155	(5,470)			
Exhaust System Backpressure, Maximum	kPa	(in H ₂ O)	6.7	(27)	6.7	(27)			

HEAT BALANCE @ 100% LOAD AND 25°C AIR ¹									
		Units Performance DM#		1600 rpm DM9255-01) rpm 245-02			
Jacket Water Overall	kW	(Btu/min)	537	(30,529)	625	(35,516)			
Atmosphere	kW	(Btu/min)	111	(6,288)	118	(6,690)			
Exhaustion ³	kW	(Btu/min)	1200	(68,259)	1610	(91,541)			
Exhaustion Recovery	kW	(Btu/min)	546	(31,025)	816	(46,378)			
Oil Cooler	kW	(Btu/min)	188	(10,713)	234	(13,315)			
From 2nd Stage Aftercooler	kW	(Btu/min)	421	(23,930)	566	(32,195)			
Work Energy	kW	(Btu/min)	1500	(85,304)	1763	(100,288)			
Low Heat Value Energy	kW	(Btu/min)	3537	(201,141)	4396	(249,983)			
High Heat Value Energy	kW	(Btu/min)	3768	(214,265)	4683	(266,295)			

FUEL SYSTEM								
		nits Ince DM#	1600 DM92	rpm 255-01		rpm 245-02		
Fuel Rail Pressure Nominal @ 100% Load	kPa	(psi)	455	(66)	483	(70)		
Max Fuel Flow to Transfer Pump (to engine)	Lpm	(gph)	21	(332)	21	(333)		
Max Allow Fuel Supply Line Restriction	kPa	(in Hg)	30	(8.9)	30	(8.9)		
Inlet Fuel Temperature	°C	(°F)	30.0	(86.0)	30.0	(86.0)		
Max Allow Fuel Temp from Transfer Pump In	°C	(°F)	66.0	(151.0)	66	(151.0)		
Max Fuel Flow to Return Line (from engine)	L/hr	(gph)	1220	(322.3)	1220	(322.3)		
Max Fuel Flow Return Line Restr.	kPa	(in Hg)	27.0	(8.0)	27.0	(8.0)		
Normal Fuel Pressure – Clean System	kPa	(psi)	415	(60.2)	415	(60.2)		
BSFC @ 100% Load ⁴	g/bkW-hr	(lb/bhp-hr)	198.3	(0.326)	209.8	(0.345)		

LUBRICATING OIL SYSTEM									
	Units Performance DM#			1600 rpm DM9255-01		rpm 245-02			
Recommended Oil Type		CAT ECF-1							
Oil Filter Type		Full-Flow							
Crankcase Ventilation Type		Closed Crankcase Ventilation							
Nom Oil Pressure w/SAE 10W30 Oil @ 99° C	kPa	(psi)	610	(88.5)	610	(88.5)			
Min LI Op w/SAE 10W30 Oil @ 99° C	kPa	(psi)	300	(43.5)	300	(43.5)			
Maximum Allowable Oil Temp	٥c	(°F)	107	(226.0)	107	(226.0)			
Lube Oil Pressure, Nominal	kPa	(psi)	393	(57.0)	468.8	(68.0)			
Lube Oil Pressure Low Idle	kPa	(psi)	255	(37.0)	248.0	(37.0)			
Sump Capacity	L	(gal)	613.2	(162)	613.2	(162)			

COOLING WATER	SYSTEM – I	HTC (ENGINE	JACKET W	ATER)		
		nits Ince DM#		1600 rpm DM9255-01		rpm 245-02
HTC Cooling Water Temperature Engine Out (nominal)	°C	(°F)	99	(210)	99	(210)
HTC Cooling Water Refill Capacity (engine only)	L	(gal)	157	(41)	157	(41)
Engine & Expansion Tank Coolant Capacity	L	(gal)	291.5	(77)	291.5	(77)
Coolant Medium		Caterpilla	r Extended Lif	e Coolant (EL(C) or Equal	
Expansion Tank Pressure Cap	kPa	(psi)	96.5	(14)	96.5	(14)
Regulator Location			Ou	tlet		
Maximun Uninterrupted Fill Rate	L/min	(gal/min)	18.9	(5)	18.5	(5)
Regulator Start-to-Open Temperature	°C	(°F)	90	(195)	88	(190)
Temp Jacket Water Pump Inlet (nominal)	°C	(°F)	89	(192)	89	(192)
Temp Jacket Water Pump Inlet (max)	°C	(°F)	92	(197)	92	(197)
Temp Jacket Water Pump Inlet (min)	°C	(°F)	83	(183)	83	(183)
Delta T Jacket Water (out-in)	°C	(°F)	5.0	(9)	5.0	(9)
Min Allowable Jacket Water Coolant Flow	L/min	(gal/min)	1204	(317)	1204.0	(317)
Max Allowable Jacket Water Coolant Flow	L/min	(gal/min)	1808	(476)	1808.0	(476)
Jacket Water Coolant Flow (nominal)	L/min	(gal/min)	1400	(368)	1400.0	(368)

COOLING W	ATER SYSTE	M – LTC (AF	TERCOOLER)		
		nits ance DM#		rpm 255-01		rpm 245-02
LTC Water Temperature Engine in (max) ⁵	°C	(°F)	32	(91)	32	(91)
Coolant Medium		Caterpilla	r Extended Lif	e Coolant (EL(C) or equal	
Expansion Tank Pressure Cap	kPa	(psi)	96.5	(14)	96.5	(14)
Min Allowable Aftercooler Coolant Flow	L/min	(gal/min)	345	(91)	387	(102)
Max Allowable Aftercooler Coolant Flow	L/min	(gal/min)	965	(254)	437	(115)
Aftercooler Coolant Flow (nominal)	L/min	(gal/min)	580	(153)	435	(115)

	STARTIN	G SYSTEM				
		nits Ince DM#		rpm 255-01) rpm 245-02
Minimum Cranking Speed Required for Start	rp	om		12	0.0	
Lowest Ambient Start Temp w/o Aids	°C	°F	0.0	(32)	0.0	(32)

	TOLERENCES		
	Units Performance DM#	1600 rpm DM9255-01	1800 rpm DM9245-02
Engine Power	+/- 3%	Specific Fuel Consumption	+/- 3%
Heat Rejection JW (block)	+/- 10%	BSFC ISO 3046/1	+ 5% / - 0%
Heat Rejection SCAC	+/- 5%	Heat Rejection Oil Cooler (OC)	+/- 20%
Heat Rejection Radiant	+/- 50%	Exhaust Stack Temperature	+/- 8%
Charge Air Pressure	+/- 10%	Fuel Rate	+/- 5%
Exhaust Flow	+/- 5%	Inlet Air Flow	+/- 5%

Notes:

¹ Air flows are shown for 25°C air inlet to the turbocharger and 43°C (109°F) cooling water to the charge air cooler. Adjust aftercooler heat load for higher ambients using the Aftercooler Heat Rejection Factors.

² 32°F and 29.98 in Hg

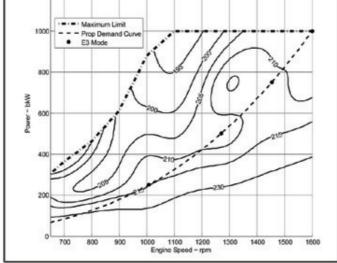
³ Exhaust heat rejection is based on fuel LHV to 25° C and is not normally recoverable in total

⁴ At 100% loads with pumps +/- 3% except where specified differently. Performance and fuel consumption are based on 35 API, 16°C fuel having a lower heating value of 42,780 kJ/kg used at 29°C with a density of 838.9 g/liter. Does not include sea water pump parasitic load.

⁵ Sizing point with 27°C Sea Water

TECHNICAL DATA RATINGS – 3512C HD 1600 RPM

Brake Specific Fuel Consumption

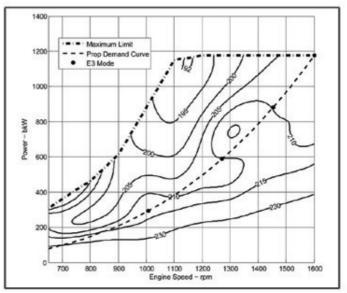


ISO 3046/1 fuel consumption (g/bkW-hr) tolerance is (+)5, (-)0% of full load data. Engine rating is with two (2) engine driven water pumps.

DM8906-00-M

Brake Specific Fuel Consumption

ээтэс ни @ 1000 грш 1175 икм магше Prop-ногодомого-



ISO 3046/1 fuel consumption (g/bkW-hr) tolerance is (+)5, (-)0% of full load data. Engine rating is with two (2) engine driven water pumps.

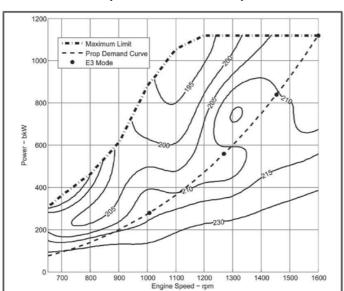
Brake Specific Fuel Consumption

3512C HD @ 1600 rpm 1230 bkW Marine Prop Tier 3 (DM9233)

DM8904-00-M

09/26/11

09/26/11

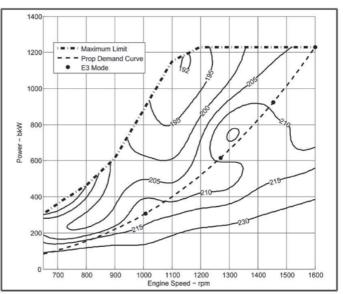


Brake Specific Fuel Consumption 3512C HD @ 1600 rpm 1120 bkW Marine Prop Tier 3 (DM9235)

ISO 3046/1 fuel consumption (g/bkW-hr) tolerance is (+)5, (-)0% of full load data. Engine rating is with two (2) engine driven water pumps.

DM8905-00-M

09/26/11



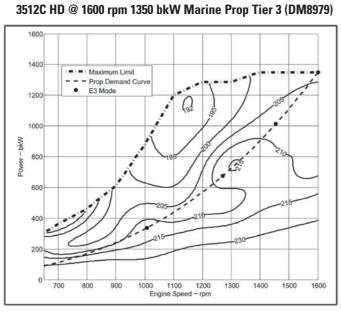
ISO 3046/1 fuel consumption (g/bkW-hr) tolerance is (+)5, (-)0% of full load data. Engine rating is with two (2) engine driven water pumps.

DM8903-00-M

09/26/11

TECHNICAL DATA RATINGS – 3512C HD 1600 RPM

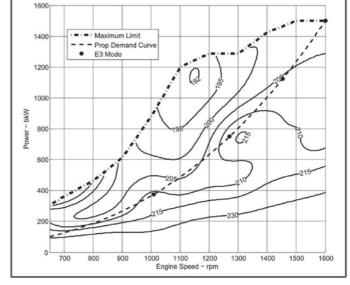
Brake Specific Fuel Consumption



ISO 3046/1 fuel consumption (g/bkW-hr) tolerance is (+)5, (-)0% of full load data. Engine rating is with two (2) engine driven water pumps.

DM8891-00-M



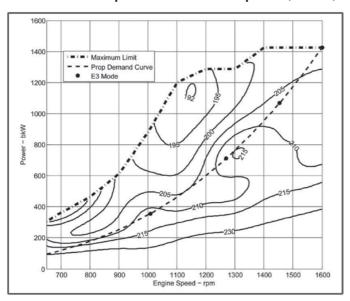




ISO 3046/1 fuel consumption (g/bkW-hr) tolerance is (+)5, (-)0% of full load data. Engine rating is with two (2) engine driven water pumps.

DM8886-00-M

09/26/11



Brake Specific Fuel Consumption 3512C HD @ 1600 rpm 1425 bkW Marine Prop Tier 3 (DM8978)

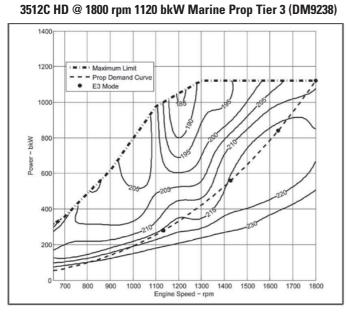
ISO 3046/1 fuel consumption (g/bkW-hr) tolerance is (+)5, (-)0% of full load data. Engine rating is with two (2) engine driven water pumps.

DM8889-00-M

09/26/11

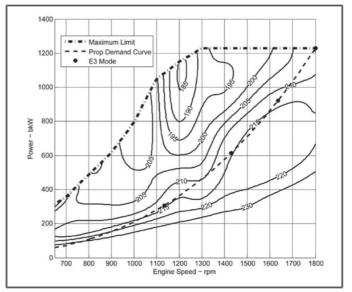
TECHNICAL DATA RATINGS – 3512C HD 1800 RPM

Brake Specific Fuel Consumption



ISO 3046/1 fuel consumption (g/bkW-hr) tolerance is (+)5, (-)0% of full load data. Engine rating is with two (2) engine driven water pumps.



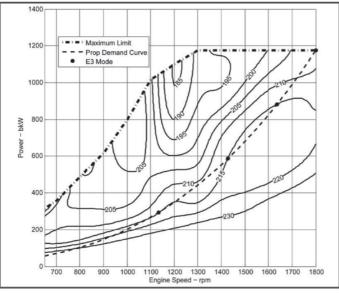


ISO 3046/1 fuel consumption (g/bkW-hr) tolerance is (+)5, (-)0% of full load data. Engine rating is with two (2) engine driven water pumps.

DM9378-00-M

09/26/11

09/26/11



Brake Specific Fuel Consumption 3512C HD @ 1800 rpm 1175 bkW Marine Prop Tier 3 (DM9237)

ISO 3046/1 fuel consumption (g/bkW-hr) tolerance is (+)5, (-)0% of full load data. Engine rating is with two (2) engine driven water pumps.

DM9380-00-M

09/26/11

EXHAUST NOISE DATA

	1800	1,118.5	1,500	113	118	114	106	105	106	106	104
	1700	942.2	1,264	112	117	113	105	103	105	105	103
	1600	785.6	1,053	111	116	111	104	102	104	104	101
	Parforma	nce Number: 1	∩M8428€8	¹⁰ Chan	ge Level:	01 ¹¹⁰	102	101	102	103	100
	1400	526.3	706	108	113	109	101	100	101	102	99
Sales Model:	1300	421.4	565	107	112	107	beedg(RPI	98,00	102	100	98
	1200	331.4	444	106	111	Rated Sl	DeeddKhi	vi): ₉₇ 1,80	100 100	99	97
Application:	MARINE PRO	PULS 129143	342	105	110	Rated Po	we₽₿BK\	N): 961,11	8.599	98	96
Rating Level:	A RASPANG (U	VRESTR®CTER		$US)^{103}$	107	Rated P	ower ³⁷ (BH	P) 961 50	0 99	92	87
Rating Loven	700	65.8	88	⁰⁰ / ₁₀₁	105	99	95 ⁽	94 ^{'',00}	97	90	86
	EXHAU	ST Sound Pre	ssure Data (OBCF)	Dista	nce: 1.	5 Meters	(4.9	Feet)		
				- /				,,	,		

			. ,				•			
ENGINE	ENGINE POWER	ENGINE POWER	OVERALL	125 HZ	250 HZ	500 HZ	1000 HZ	2000 HZ	4000 HZ	8000 HZ
RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
1800	1,118.5	1,500	113	118	114	106	105	106	106	104
17001800	94212118.5	1,2641,500	112 100	117 10	8 113 10	2 105 93	103 92	105 93	105 92	103 90
16001700	785.6942.2	1.0531,264	111 99	116 10	7 111 10	1 104 92	102 91	104 91	104 91	101 88
15001600	647.3785.6	8681,053	109 97	114 10	5 110 99	9 102 90	101 89	102 90	103 91	100 86
14001500	526.3647.3	706 868	108 96	113 10	3 109 97	7 101 88	100 88	101 89	102 90	99 85
13001400	421.4526.3	565 706	107 95	112 10	2 107 96	6 100 87	98 87	102 88	100 89	98 84
12001300	331.4421.4	444 565	106 94	111 10	0 106 95	5 99 88	97 87	100 88	99 88	97 83
11001200	255.3831.4	342 444	105 93	110 99) 105 94	1 98 87	96 86	99 87	98 87	96 82
900 1100	139.8255.3	187 342	103 91	107 98	3 101 92	2 97 85	96 85	99 86	92 85	87 80
700 900	65.8139.8	88 187	101 90	105 98	99 89	95 86	94 84	97 84	90 79	86 74
700	65.8	88	88	96	6 87	7 84	82	82	77	73

EX	HAUST Sound	Pressure Dat	a (OBC	F)		Dis	tance	e:	7 1	/lete	rs (23.	0 Fe	et)				
ENGINE SPEED	ENGINE POWER	ENGINE POWER	OVERA	LL	125 HZ		250 HZ		500 HZ		1000 HZ)	2000 HZ)	4000 HZ		800 HZ	
RPM	BKW	BHP	DB(A))	DB		DB		DB		DB		DB		DB		DB	
1800	1.118.5	1.500	100		108		102		93		92		93		92		90	
17001800	94212118.5	1,2641,500	99	93	107	101	101	95	92	87	91	85	91	86	91	86	88	83
16001700	785.6942.2	1.0531,264	97	92	105	100	99	94	90	86	89	84	90	85	91	84	86	82
15001600	647.3785.6	8681,053	96	91	103	98	97	92	88	83	88	83	89	84	90	84	85	80
14001500	526.3647.3	706 868	95	89	102	97	96	91	87	82	87	81	88	82	89	83	84	78
13001400	421.4526.3	565 706	94	88	100	96	95	90	88	81	87	80	88	81	88	82	83	77
12001300	331.4421.4	444 565	93	87	99	94	94	88	87	81	86	81	87	82	87	81	82	76
11001200	255.3331.4	342 444	91	86	98	92	92	87	85	80	85	80	86	80	85	80	80	75
900 1100	139.8255.3	187 342	90	85	98	91	89	86	86	79	84	79	84	79	79	79	74	74
700 900	65.8139.8	88 187	88	83	96	91	87	82	84	79	82	77	82	77	77	72	73	68
700	65.8	88		81		89		80		77		76		75		70		66

	EXHAUST	Sound Press	sure Data (Ol	3CF)	Distance	: 15 Met	ters (4	9.2 Feet)	
ENG				RALL 125 HZ		500 HZ	1000 HZ	2000 HZ	4000 HZ	8000 HZ
RP	M BK	N B⊢	IP DE	B(A) DB	DB	DB	DB	DB	DB	DB
180	0 1.	118.5 1	.500 93	3 101	95	87	85	86	86	83
170	0	942.2 1	,264 92	2 100	94	86	84	85	84	82
160	0	785.6 1	.053 91	1 98	92	83	83	84	84	80
150	0	647.3	868 89	9 97	91	82	81	82	83	78
140	0	526.3	706 88	3 96	90	81	80	81	82	77
130	0	421.4	565 87	7 94	88	81	81	82	81	76
120	0	331.4	444 86	6 92	87	80	80	80	80	75
110	0	255.3	342 85	5 91	86	79	79	79	79	74
90)	139.8	187 83	3 91	82	79	77	77	72	68
70)	65.8	88 81	1 89	80	77	76	75	70	66

Data Date: 3/29/2011

Sound Performance Number: DM8779-06

Performance Number: DM8427

Change Level: 01

Sales Model: 3512 Application: MAR Rating Level: A RA ME	1400 1300 1300 1300 1300 1300	RESTRIGE 526.3 421.4 L Sound Pre	706 565 ssure Data	OUS)		96	Rated Rated 9 ance: 9	2 Power 7 Powe 5 5 4 1 M	eters (99800 9 ⁹ 118.5 97500 96 96 393 Fe 93 5	98 97 97 96 96 96 95	98 97 96 95 95 93 93 92 8000	102 101 100 99 98 97 96 95
SPEED	$= \frac{900}{700}$ PO	BINE 255.3 139.8 NER 65.8		UVERAL		25 95 HZ 94	250 92 HZ 9	LI7	88 1000 87 HZ	93 2000 92 HZ	94 4000 93 HZ	91 8000 90 HZ	94 93
RPM	BI	<w 60.0<="" td=""><td>внр</td><td>DB(A)</td><td></td><td>ов С</td><td>DB</td><td>DB</td><td>DB</td><td>DB</td><td>DB</td><td>DB</td><td></td></w>	внр	DB(A)		ов С	DB	DB	DB	DB	DB	DB	
1800		1.118.5	1.500	104	9	9	100	98	99	100	98	102	
1700		942.2	1,264	104		8	99	97	99	100	97	101	
1600		785.6	1,053	103		9	98	95	98	98	96	100	
1500		647.3	868	102		8	97	94	97	97	95	99	
1400		526.3	706	102		7	96	93	96	97	95	98	
1300		421.4	565	101		8	95	91	96	96	93	97	
1200	1800	331.4	444 342 1,500	101	00	7 6 87	94	90	95 86 oz	96 87 05	93 88 og	96 86 05	90
1100	1700	255.3 ^{1,118.5}	JT2 4 004	100	00 ⁹	0 06	94	, 09	05 94	90	00 ⁹²	90	90
900	1600	139.0 705.0		99	9	07	92 0	00	30	~~ 34	00 ⁹¹	o 4 94	88
700	1500	65.8 ^{785.6} 647.3	88 1,053 868	97	90 g	14 87 86	91 ⁸		83 92 82	86 93 85	86 90 85	⁸⁴ 93 83	87
	1400	526.3	706		90	85	8		81	84	85	83	87
	1300	421 4	565		89	86	8	3	79	84	85	81	85
		L Sound Pre	ssure Daata	(OBCF	89	Dist	ance: 8	27 M	etærs (2330 Fe	eta}₄	81	84
ENGINE	- 1100 ENC	INE 255.3 139.8	342	OVERAL	1 ⁸⁸ 1	25 ⁸⁴	250 8		77 1000	82 2000	⁸³ 4000	80 8000	83
SPEED						83	11 8	, .	/6	81	82	⁷⁹	82
RPM	700	0.00	BHP 88	DB(A)	65	72 82 DB	HZ 79 DB	9 nz DB	75 HZ DB	80 HZ DB	81 HZ DB	78 HZ DB	81
RPIN	ы		впр	DB(A)	L	ЛВ	DB	DB	υв	DB	υв		
4000		1440 5	4 500	. ,				00		00	00		_
1800		1,118.5	1,500	92	8	57	88	86	87	88	86	90	
1700		942.2	1.264	92 92	8 8	6	88 87	85	87 87	88	85	90 90	
1700 1600		942.2 785.6	1.264 1,053	92 92 91	8 8 8	57 56 57	88 87 86	85 83	87 87 86	88 86	85 84	90 90 88	
1700 1600 1500		942.2 785.6 647.3	1.264 1,053 868	92 92 91 90	8 8 8 8	37 36 37 36	88 87 86 85	85 83 82	87 87 86 85	88 86 85	85 84 83	90 90 88 87	
1700 1600 1500 1400		942.2 785.6 647.3 526.3	1.264 1.053 868 706	92 92 91 90 90	8 8 8 8 8	87 86 87 86 85	88 87 86 85 84	85 83 82 81	87 87 86 85 84	88 86 85 85	85 84 83 83	90 90 88 87 87	
1700 1600 1500 1400 1300		942.2 785.6 647.3 526.3 421.4 331.4	1.264 1.053 868 706 565	92 92 91 90 90 89	8 8 8 8 8 8 8	87 86 87 86 85 86	88 87 86 85 84 83	85 83 82 81 79	87 87 86 85 84 84	88 86 85 85 85	85 84 83 83 81	90 90 88 87 87 85	
1700 1600 1500 1400 1300 1200	1800	942.2 785.6 647.3 526.3 421.4 331.4	1.264 1.053 868 706 565 444	92 92 91 90 90 89 89	8 8 8 8 8 8 87 87 8	97 96 97 96 95 96 95 94 81	88 87 86 85 84 83 82 82 82	85 83 82 81 79 78 2 77	87 87 86 85 84 84 84 83 80 82	88 86 85 85 85 85 84 81 83	85 84 83 83 81 81 83 80	90 90 88 87 87 85 85 84 80 83	84
1700 1600 1500 1400 1300 1200 1100	1800 1700	942.2 785.6 647.3 526.3 421.4 331.4 255.3 ¹ ,118.5 139.8 942.2	1.264 1.053 868 706 565 444 342 1,500 187 1,264	92 92 91 90 90 89 89 88	8 8 8 8 8 8 87 8 86 8 8 8 8 8 8 8 8 8 8	57 56 57 55 55 55 54 81 53 81 81	88 87 86 85 84 83 82 82 82 80 80	85 83 82 81 79 78 2 77 1 76	87 87 86 85 84 84 83 80 82 79 81	88 86 85 85 85 85 84 81 83 81 83	85 84 83 81 81 83 80 82 79	90 90 88 87 87 85 84 80 83 80 82	84
1700 1600 1500 1400 1300 1200	1800 1700 1600	942.2 785.6 647.3 526.3 421.4 331.4 255.3 ¹ ,118.5 139.8 942.2 65.8 785.6	1.264 1.053 868 706 565 444 342 1,500 187 1,264 88 1,053	92 92 91 90 90 89 89	8 8 8 8 8 87 86 86 85 85 8	57 56 57 55 55 55 55 55 55 54 81 53 81 52 81	88 87 86 85 84 83 82 82 82 82 80 87 9 81	85 83 82 81 79 78 2 77 1 76 0 75	87 87 86 85 84 84 83 80 82 79 81 77 80	88 86 85 85 84 81 83 81 82 80 81	85 84 83 81 81 83 80 82 79 80 78	90 90 88 87 87 85 84 80 83 80 82 78 81	84 82
1700 1600 1500 1400 1300 1200 1100 900	1800 1700 1600 1500	942.2 785.6 647.3 526.3 421.4 331.4 255.3 ¹ ,118.5 139.8 942.2 785.6 65.8 785.6 647.3	1.264 1.053 868 706 565 444 342 1,500 187 1,264 8 1,053 868	92 92 91 90 90 89 89 88 88 87	8 8 8 8 87 86 85 85 85	7 66 55 55 55 55 54 81 52 81 52 81 80	88 87 86 85 84 83 82 82 82 80 80 87 9 81 79	85 83 82 81 79 78 2 77 1 76 0 75	87 87 86 85 84 84 83 80 82 79 81 77 80 76	88 86 85 85 84 81 83 81 82 80 81 79	85 84 83 81 81 81 82 79 80 78 80	90 90 88 87 87 85 84 80 83 80 82 78 81 78	84 82 81
1700 1600 1500 1400 1300 1200 1100 900	1800 1700 1600 1500 1400	942.2 785.6 647.3 526.3 421.4 331.4 255.3 ¹ .118.5 139.8 785.6 647.3 526.3	$\begin{array}{c} 1.264 \\ 1.053 \\ 868 \\ 706 \\ 565 \\ 444 \\ 342 \\ 1,500 \\ 187 \\ 1,264 \\ 88 \\ 1,053 \\ 868 \\ 706 \end{array}$	92 92 91 90 90 89 89 88 88 87	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	7 66 55 55 55 54 81 33 81 32 81 80 80	88 87 86 85 84 83 82 82 80 80 80 87 9 79 79	85 83 82 81 79 78 2 77 1 76 0 75 9	87 87 86 85 84 84 83 80 82 79 81 77 80 76	88 86 85 85 84 81 83 81 82 80 81 79 79	85 84 83 81 81 83 80 82 79 80 78 80 79	90 90 88 87 87 85 84 80 83 80 82 78 81 78 77	84 82 81 81
1700 1600 1500 1400 1300 1200 1100 900 700	1800 1700 1600 1500 1400 1300	942.2 785.6 647.3 526.3 421.4 331.4 255.3,1,118.5 139.8 942.2 65.8 785.6 647.3 526.3 421.4	1.264 1.053 868 706 565 444 342 1,500 187 1,264 88 1,053 868 706 565	92 92 91 90 90 89 89 88 87 85	8 8 8 8 8 8 7 8 8 8 8 8 8 8 5 8 8 5 8 8 8 5 8 8 8 3	7 66 57 66 55 66 55 65 55 86 81 81 82 81 80 80 80 80	88 87 86 85 84 83 82 82 82 80 87 77 77 77	85 83 82 81 79 78 77 77 76 75 9 7	87 87 86 85 84 83 80 82 79 81 77 80 76 76 73	88 86 85 85 84 81 83 81 82 80 81 79 79 78	85 84 83 81 81 83 80 82 79 80 78 80 79 79	90 90 88 87 87 85 85 84 80 83 80 82 78 81 78 77 76	84 82 81 81 79
1700 1600 1500 1400 1300 1200 1100 900 700	1800 1700 1600 1500 1400 1300 CettoNICA	942.2 785.6 647.3 526.3 421.4 255.3 ¹ ,118.5 139.8 942.2 65.8 785.6 647.3 526.3 421.4 L Sougt Pre	1.264 1.053 868 706 565 444 342 1,500 187 1,264 88 1,053 868 706 565 565 565	92 92 91 90 90 89 89 88 87 85 (OBCF	8 8 8 8 8 8 7 8 8 8 8 8 8 8 5 8 8 8 5 8 8 8 3 8 3	77 66 75 75 75 75 75 80 81 81 81 80 80 80 80 80 80 80 80 80 80 80 80 80	88 87 86 85 84 83 82 82 80 88 80 88 80 87 79 77 77 77 77 77	85 83 82 81 79 78 77 76 75 9 7 7 7 7 7 7 7 7 7	87 87 86 85 84 84 83 80 82 79 81 77 80 76 76 76 76 76 73 80 76 76 76 77 80 76	88 86 85 85 84 81 83 81 80 81 79 79 79 79 79 79 79 79 79 79 79 79 79	85 84 83 83 81 83 80 82 79 80 79 79 79 79 79 79 79	90 90 88 87 87 85 84 80 83 80 82 78 81 78 77 76 75 74	84 82 81 81 79 78
1700 1600 1500 1400 1300 1200 1100 900 700 ME	1800 1700 1600 1500 1300 CG<u>t</u>tANICA = 1100 900 ENC	942.2 785.6 647.3 526.3 421.4 331.4 255.3 ¹ ,118.5 139.8 942.2 785.6 647.3 526.3 421.4 526.3 421.4 Sougel Pre SINE 255.3 139.8 C	1.264 1.053 868 706 565 444 342 1,500 187 1,264 88 1,053 88 706 565 565 565 565 565 565 565 5	92 92 91 90 90 89 89 88 87 85	87 8 86 8 87 8 86 8 85 8 85 8 85 8 85 8 85 8 85 8 85	77 16 17 16 15 16 15 16 15 16 15 16 15 16 15 16 16 17 18 18 11 12 18 11 12 18 11 12 18 11 12 18 19 12 13 18 11 12 18 19 12 13 18 19 12 13 18 19 12 13 18 19 12 19 10 10 10 10 10 10 10 10 10 10	88 87 86 85 84 82 82 82 82 82 82 83 80 87 77 77 77 77 77 250 77 71 250 77	85 83 82 81 79 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	87 87 86 85 84 83 80 82 79 81 77 80 76 76 76 76 76 76 76 72 20 000	88 86 85 85 84 81 83 81 82 80 81 79 79 79 79 79 79 79 75 2000	85 84 83 83 81 83 80 82 79 80 79 79 79 79 79 79 79 79 79 79 79 79 79	90 90 88 87 87 85 84 80 83 80 82 78 81 78 77 76 75 74 8000 73	84 82 81 81 79
1700 1600 1500 1400 1300 1200 1100 900 700 ME ENGINE SPEE	1800 1700 1600 1500 1300 CGLANICA = 100 900 ENC 900 PO	942.2 785.6 647.3 526.3 421.4 331.4 255.3 ¹ ,118.5 139.8 942.2 785.6 647.3 526.3 421.4 526.3 421.4 526.3 421.4 139.8 647.3 526.3 421.4 526.3 421.4 526.3 421.4 139.8 8 139.8 VER 6 65.8 0 VER 65.8 0	1.264 1.053 868 706 565 444 342 1,500 187 1,264 88 1,053 868 706 565 565 565 565 565 565 565 5	92 92 91 90 89 89 88 87 85 (OBCF 0VERAL	87 88 87 88 86 88 85 88 86 88 86 88 85 88 86 88 86 88 86 88 86 86 86 86 86 86 86 86 86 8	77 16 17 16 15 15 16 15 15 16 15 15 16 15 15 16 15 15 13 13 13 13 13 13 13 13 13 13	88 87 86 85 84 82 82 82 82 82 82 83 80 87 77 77 77 77 250 71 74 74 74 74 74 74 74 74 74 74 74 74 74	85 83 82 81 79 2 77 1 76 7 75 9 7 7 7 15 M 6 5 500 3 HZ	87 87 86 85 84 84 83 80 82 79 81 77 80 76 76 76 76 76 73 etters (72 1000 69 HZ	88 86 85 85 84 81 83 81 82 80 81 79 79 79 79 79 79 79 79 79 79 79 79 79	85 84 83 83 81 83 80 82 79 80 79 79 79 79 79 79 79 79 79 79 79 79 79	90 90 88 87 87 85 84 80 83 80 82 78 81 78 81 77 76 75 74 8000 73 72 HZ	84 82 81 81 79 78 78
1700 1600 1500 1400 1300 1200 1100 900 700 ME ENGINE SPEEL RPM	1800 1700 1600 1500 1300 CGLASNICA = 1100 900 700 PO BI	942.2 785.6 647.3 526.3 421.4 331.4 255.3 ¹ ,118.5 785.6 647.3 526.3 421.4 526.3 421.4 526.3 421.4 526.3 421.4 139.8 Free NER 65.8 65.8 00 WER 65.8 00 WER 65.8 00	1.264 1.053 868 706 565 444 342 1,500 187 1,264 88 1,053 868 706 565 565 565 565 565 565 565 5	92 92 91 90 90 89 89 88 87 85 (OBCF 0VERAL	87 88 87 88 86 88 85 88 80 80 80 80 80 80 80 80 80 80 80 80	77 66 55 66 55 68 13 81 13 80 80 Dist 79 77 77 76 DB	88 87 86 85 84 82 82 82 82 82 82 83 84 83 82 87 77 77 77 77 72 50 71 72 71 72 71 72 71 72 71 72 71 72 71 72 72 72 72 72 72 72 72 72 72 72 72 72	85 83 82 81 79 2 77 1 76 0 75 9 7 7 7 7 7 5 5 00 7 7 5 5 00 5 5 00 5 8 7 8 7 7 7 7 7 7 5 9 9 7 7 5 9 9 7 7 5 9 9 7 7 5 9 7 7 8 1 7 8 1 7 8 1 7 8 1 7 8 1 7 8 1 7 8 1 7 8 1 7 7 8 1 7 7 8 1 7 7 8 1 7 7 8 1 7 7 8 1 7 7 8 1 7 7 8 7 7 7 7	87 87 86 85 84 84 83 80 82 79 81 77 80 76 76 76 76 76 76 76 72 1000 70 HZ DB	88 86 85 85 84 81 83 81 82 80 81 79 79 79 79 79 79 79 79 79 79 79 79 79	85 84 83 83 81 83 80 79 79 79 79 79 79 79 79 79 79 79 79 79	90 90 88 87 87 85 84 80 83 80 82 78 81 78 81 77 76 75 74 8000 73 72 DB	84 82 81 79 78 78 76
1700 1600 1500 1400 1300 1200 1100 900 700 ME ENGINE SPEEL <u>RPM</u> 1800	1800 1700 1600 1500 1300 CGLASNICA = 1100 900 700 PO BI	942.2 785.6 647.3 526.3 421.4 331.4 255.3,1,118.5 139.8 942.2 785.6 647.3 526.3 421.4 Counter for the second secon	1.264 1.053 868 706 565 444 342 1,500 187 1,264 342 1,500 565 565 565 565 565 565 565	92 92 91 90 89 89 88 87 85 (OBCF 0VERAL DB(A) 87	87 88 86 88 85 88 86 88 85 88 86 88 85 88 86 88 85 88 86 88 85 88 86 888	77 66 55 55 66 55 68 55 64 81 13 81 13 80 80 80 80 80 80 80 80 80 80	88 87 86 85 84 82 82 82 82 82 80 83 87 9 7' 7' 7' 7' 7' 7' 7' 7' 7' 250 7' 7' 7' 80 7' 7' 80 7' 7' 80 7' 80 7' 80 7' 80 80 80 80 80 80 80 80 80 80 80 80 80	85 83 82 81 79 78 2 77 1 76 9 75 9 7 7 7 15 M 6 5 500 5 HZ DB 80	87 87 86 85 84 83 80 82 79 81 77 80 76 76 76 76 73 etters (72 1000 70 HZ DB	88 86 85 85 84 81 83 81 82 80 81 79 79 79 79 79 79 79 75 2000 75 74 HZ DB 83	85 84 83 83 81 83 80 82 79 79 79 79 79 79 79 79 79 79 79 79 79	90 90 88 87 87 85 84 80 83 80 82 78 81 77 76 75 74 8000 73 72 HZ DB	84 82 81 79 78 78 76
1700 1600 1500 1400 1300 1200 900 700 ME ENGINE SPEEL <u>RPM</u> 1800 1700	1800 1700 1600 1500 1300 CGLASNICA = 1100 900 700 PO BI	942.2 785.6 647.3 526.3 421.4 255.3,1,118.5 139.8 942.2 785.6 647.3 526.3 421.4 L Sound Pre 51NE 255 3 139.8 WER 65.8 PO (W E	1.264 1.053 868 706 565 444 342 1,500 187 1,264 88 706 565 565 565 565 565 565 565 5	92 92 91 90 90 89 88 88 87 85 (OBCF DVERAL DB(A) 87 86	87 88 86 88 85 88 85 88 84 83 82 1 81 1 80 1 80 1 81 80 83 82 83 84 83 83 84 83 85 84 83 85 84 85 83 85 83 85 83 84 83 83 83 83 83 83 83 83 83 83 83 83 83	7 6 7 6 5 5 6 5 5 8 1 3 81 1 2 80 Digg 79 1 2 79 1 2 79 1 2 79 1 2 79 1 2 79 1 1 1 1 1 1 1 1	88 87 86 85 84 83 82 82 82 82 82 82 87 9 81 71 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	85 83 82 81 79 78 2 77 76 75 9 7 7 7 15 M 6 5 500 5 HZ DB 80 79	87 87 86 85 84 83 80 82 79 81 77 80 76 73 eters (72 70 9 70 9 70 9 81 81 81 81	88 86 85 85 84 81 80 81 79 79 78 4972 Fee 77 75 2000 75 74 DB 83 82	85 84 83 83 81 83 80 82 79 79 79 79 79 79 79 79 79 79 79 79 79	90 90 88 87 87 85 84 80 83 80 82 78 81 77 76 75 74 8000 73 72 HZ DB 84 84	84 82 81 79 78 78 76
1700 1600 1500 1400 1300 1200 900 700 700 ME ENGINE SPEEL RPM 1800 1700 1600	1800 1700 1600 1500 1300 CGLASNICA = 1100 900 700 PO BI	942.2 785.6 647.3 526.3 421.4 255.3,1,118.5 139.8 942.2 785.6 647.3 526.3 421.4 L Sound Pre 139.8 Wer 65.8 65.8 00 Wer 1,118.5 942.2 785.6	1.264 1.053 868 706 565 444 342 1,500 187 1,264 1,503 SSURE BHP 1.500 1.264 1.053	92 92 91 90 90 89 89 88 87 85 (OBCF 0VERAL DB(A) 87 86 85	87 88 86 85 83 83 83 84 83 83 84 83 83 84 83 83 84 83 84 83 83 84 83 83 84 83 83 84 83 83 83 83 83 83 83 83 83 83 83 83 83	77 66 55 55 66 55 66 55 81 13 81 13 81 12 80 80 Dist 79 77 12 79 12 79 14 79 14 70 15 50 80 17 80 17 18 80 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11	88 87 86 85 84 82 82 82 82 83 82 83 84 87 9 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	85 83 82 81 79 78 2 77 76 75 9 7 7 7 7 15 M 6 5 500 3 HZ DB 80 79 77	87 87 86 85 84 83 80 82 79 81 77 80 76 73 80 76 73 eters (72 1000 70 HZ DB 81 81 81 80	88 86 85 85 84 81 80 81 80 81 80 81 79 79 78 4972 Fee 77 75 74 DB 83 82 80	85 84 83 83 81 80 82 79 79 79 79 79 79 79 79 79 79 79 79 79	90 90 88 87 87 85 84 80 83 80 82 78 81 77 76 75 74 8000 73 72 HZ DB 84 84 84 82	84 82 81 79 78 78 76
1700 1600 1500 1400 1300 1200 1100 900 700 ME ENGINE SPEEL <u>PPM</u> 1800 1700 1600 1500	1800 1700 1600 1500 1300 CGLASNICA = 1100 900 700 PO BI	942.2 785.6 647.3 526.3 421.4 331.4 255.3 ¹ ,118.5 785.6 647.3 526.3 421.4 Source A C Source C Source C Source C Source C Source C Source C Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Sou	1.264 1.053 868 706 565 444 342 1,500 187 1,264 1,053 88 706 565 SSURE Data 88 187 WER 88 BHP 1.264 1.264 1.253 868	92 92 91 90 90 89 89 88 87 85 (OBCF DVERAL DB(A) 87 86 85 85 85	87 88 86 88 85 88 85 88 85 88 84 83 83 83 84 83 83 18 81 1 80 1 80 1 80 1 88 88 84 88 83 88 84 88 84 88 84 88 84 88 84 88 85 88 84 88 85 88 86 88 85 88 85 88 86 88 85 88 86 88 85 88 86 88 85 88 86 88 86 88 86 88 86 88 86 88 86 88 88 8	77 166 177 166 155 166 155 166 155 166 167 181 192 10 10 10 11 10 10 10 10 10 10	88 87 86 85 84 82 82 82 82 83 80 82 87 9 77 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	85 83 82 77 77 77 77 715 80 5 500 5 77 715 80 77 715 80 77 715 80 77 77 77 77 77 77 77 77 77 77 77 77 77	87 87 86 85 84 84 83 80 82 79 81 77 80 76 76 76 76 76 76 76 76 76 76 70 9 81 72 000 69 HZ DB 81 81 80 79	88 86 85 85 84 81 83 81 82 79 79 79 79 79 79 79 79 79 79 79 79 79	85 84 83 83 81 83 80 79 79 79 79 79 79 79 79 79 79 78 80 78 78 80 78 80 78 80 80 78 78 78 78 78 78 78 78	90 90 88 87 87 85 84 80 83 80 82 78 81 77 76 75 74 8000 73 72 DB 84 84 82 81	84 82 81 79 78 78 76
1700 1600 1500 1400 1300 1200 1100 900 700 ME ENGINE SPEEL RPM 1800 1700 1600 1500	1800 1700 1600 1500 1300 CGLASNICA = 1100 900 700 PO BI	942.2 785.6 647.3 526.3 421.4 331.4 255.3 ¹ ,118.5 39.8 942.2 65.8 785.6 647.3 526.3 421.4 39.8 785.6 647.3 526.3 421.4 139.8 785.6 647.3 526.3	1.264 1.053 868 706 565 444 342 1,500 187 1,264 88 706 565 565 565 565 565 565 565 5	92 92 91 90 90 89 89 88 87 85 (OBCF 0VERAL DB(A) 87 86 85 85 85 85	87 8 86 8 85 8 85 8 84 8 83 8 84 8 83 8 84 8 83 8 84 8 80 1 80 1 80 1 80 2 88 8 88 8 88 8 88 8 88 8 88 88 8 88 88	77 166 177 166 155 166 155 167 168 168 168 169 169 179 174 174 174 174 174 174 174 174	88 87 86 85 84 82 82 82 82 82 82 83 80 79 77 77 77 77 77 77 77 77 77 77 77 77	85 83 82 77 78 77 77 715 76 5 500 77 715 80 79 77 715 80 79 77 715 80 79 77 76 76 76	87 87 86 85 84 84 83 80 82 79 81 77 80 76 76 76 76 76 76 76 76 76 76 76 76 76	88 86 85 85 84 81 83 81 82 80 81 79 79 79 79 79 79 79 79 79 79 79 79 79	85 84 83 83 81 83 80 79 79 79 79 79 79 79 79 79 79 79 79 79	90 90 88 87 87 85 84 80 83 80 82 78 81 77 76 75 74 73 72 DB 84 84 84 84 82 81 81	84 82 81 79 78 78 76
1700 1600 1500 1400 1300 1200 1100 900 700 ME ENGINE SPEED RPM 1800 1700 1600 1500 1400 1300	1800 1700 1600 1500 1300 CGLASNICA = 1100 900 700 PO BI	942.2 785.6 647.3 526.3 421.4 331.4 255.3 ¹ ,118.5 785.6 647.3 526.3 421.4 Sound Pre SINE 139.8 785.6 647.3 526.3 421.4 Sound Pre 647.3 526.3 421.4	1.264 1.053 868 706 565 444 342 1,500 1,264 1,505 868 706 565 565 565 565 565 565 565 5	92 92 91 90 89 89 88 87 85 (OBCF 0VERAL 0VERAL 87 86 85 85 85 85 85	87 88 86 88 85 88 85 88 85 88 84 83 83 83 81 1 80 1 80 1 80 1 80 1 88 88 88 88 88 88 88 88 88 88 88 88 88	77 16 17 16 15 15 14 13 13 13 13 13 13 14 13 14 14 15 15 15 15 15 15 16 15 15 15 15 15 15 15 15 15 15	88 87 86 85 84 82 82 82 82 82 83 80 83 87 77 77 77 77 77 77 77 77 77 77 77 77	85 83 82 77 78 77 77 77 715 80 7 7 715 80 7 7 7 7 5 500 3 80 79 77 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	87 87 86 85 84 84 83 80 82 79 81 77 80 76 76 76 76 76 76 76 76 76 76 70 80 76 76 76 76 81 81 81 81 80 79 79 79 79 79 79 79 79	88 86 85 85 84 81 83 81 82 80 81 79 79 79 79 79 79 79 79 79 79 79 79 79	85 84 83 83 81 83 80 79 79 79 79 79 79 79 79 79 79 79 79 79	90 90 88 87 87 85 84 80 83 80 82 78 81 77 76 75 74 8000 73 72 DB 84 84 84 82 81 81 79	84 82 81 79 78 78 76
1700 1600 1500 1400 1300 1200 1100 900 700 ME ENGINE SPEE RPM 1800 1700 1600 1500 1400 1300 1200	1800 1700 1600 1500 1300 CGLASNICA = 1100 900 700 PO BI	942.2 785.6 647.3 526.3 421.4 331.4 255.3 ¹ ,118.5 331.4 255.3 ¹ ,118.5 785.6 647.3 526.3 421.4 339.8 WER 647.3 526.3 421.4 139.8 WER 65.8 647.3 526.3 421.4 139.8 WER 65.8 647.3 526.3 421.4 331.4	1.264 1.053 868 706 565 444 342 1,500 1.264 1.500 565 SINE 342 NER 88 88 88 88 88 1.500 1.264 1.505 1.505 1.264 1.505 1.505 1.264 1.505 1.555 1.444 1.505	92 92 91 90 89 89 88 87 85 (OBCF OVERAL DB(A) 87 86 85 85 85 85 84 83 83	87 88 87 88 85 88 87 88 80 1 81 1 81 1 80 1 81 88 87 8 87 88 87 88 87 88 85 88 86 88 85 88 85 88 85 88 85 88 85 88 85 88 86 88 86 88 87 88 85 88 86 88 86 88 87 88 88 85 88 88 7 88 87 88 88 7 88 88 87 88 88 888	77 66 67 66 65 65 65 66 65 65 68 81 80 80 Dist 97 77 76 08 11 11 11 10 10 10 11 11 10 10	88 87 86 85 84 82 82 82 82 82 83 80 84 87 9 79 77 72 50 71 72 50 71 72 50 71 72 72 72 72 72 72 72 72 72 72 72 72 72	85 83 82 81 79 78 2 77 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	87 87 86 85 84 83 80 82 79 81 77 80 76 76 76 76 76 73 etters (72 1000 70 HZ 0B 81 81 81 80 79 79 79 78 77	88 86 85 85 84 81 83 81 82 80 81 79 79 79 79 79 79 79 79 79 79 79 79 79	85 84 83 83 81 83 80 79 79 79 79 79 79 79 79 79 79 79 79 79	90 90 88 87 87 85 84 80 83 80 82 78 81 77 76 75 74 8000 75 74 8000 75 74 84 84 84 84 82 81 79 78	84 82 81 79 78 78 76
1700 1600 1500 1400 1300 1200 900 700 ME ENGINE SPEEL <u>RPM</u> 1800 1700 1600 1500 1400 1300 1200 1100	1800 1700 1600 1500 1300 CGLASNICA = 1100 900 700 PO BI	942.2 785.6 647.3 526.3 421.4 255.3 ^{1,118.5} 139.8 942.2 785.6 647.3 526.3 421.4 139.8 421.4 785.6 647.3 526.3 421.4 139.8 942.2 785.6 647.3 526.3 421.4 139.8 942.2 785.6 647.3 526.3 421.4 331.4 255.3	1.264 1.053 868 706 565 444 342 1,500 187 1,264 88 706 565 565 565 565 565 565 565 5	92 92 91 90 89 88 87 85 (OBCF OVERAL DB(A) 87 86 85 85 85 84 83 83 83 82	87 88 87 88 86 88 85 88 84 83 82 1 81 1 80 1 80 1 80 1 83 88 84 83 88 84 83 88 84 87 7 77	77 66 67 66 65 65 65 65 65 66 65 67 81 83 81 80 Digg 79 25 79 77 76 00 77 76 00 11 11 12 80 80 15 81 81 80 15 81 80 15 81 80 15 80 15 81 80 15 80 15 80 15 80 15 80 15 80 15 80 15 80 15 80 17 77 76 00 17 77 76 00 17 77 76 00 17 77 76 00 17 77 76 00 17 77 79 99 99	88 87 86 85 84 82 82 82 83 82 83 80 87 77 77 7 ance: 7 7 ance: 7 7 b 82 81 80 79 79 79 77 77 76	85 83 82 81 79 78 2 77 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	87 87 86 85 84 84 83 80 82 79 81 77 80 76 76 73 eters (72 70 HZ 00 HZ 0B 81 81 81 81 81 80 79 79 79 70 77 77	88 86 85 85 84 81 83 81 82 80 81 79 79 79 79 75 2000 75 2000 77 75 2000 74 DB 83 82 80 80 79 79 79 79 79 79 79 79 79 79 79 79 79	85 84 83 83 81 83 80 79 79 79 79 79 79 79 79 79 79 79 79 79	90 90 88 87 87 85 84 80 83 80 82 78 81 77 76 75 74 8000 73 72 DB 84 84 84 82 81 79 78 78	84 82 81 79 78 78 76
1700 1600 1500 1400 1300 1200 1100 900 700 ME ENGINE SPEE RPM 1800 1700 1600 1500 1400 1300 1200	1800 1700 1600 1500 1300 CGLASNICA = 1100 900 700 PO BI	942.2 785.6 647.3 526.3 421.4 331.4 255.3 ¹ ,118.5 331.4 255.3 ¹ ,118.5 785.6 647.3 526.3 421.4 339.8 WER 647.3 526.3 421.4 139.8 WER 65.8 647.3 526.3 421.4 139.8 WER 65.8 647.3 526.3 421.4 331.4	1.264 1.053 868 706 565 444 342 1,500 1.264 1.500 565 SINE 342 NER 88 88 88 88 88 1.500 1.264 1.505 1.505 1.264 1.505 1.505 1.264 1.505 1.555 1.444 1.505	92 92 91 90 89 89 88 87 85 (OBCF OVERAL DB(A) 87 86 85 85 85 85 84 83 83	87 88 86 88 85 88 85 88 85 88 84 83 83 1 83 1 83 1 81 1 80 1 83 1 83 1 83 8 84 8 83 8 84 8 83 8 84 8 87 7 77 7 77 7	77 66 67 66 55 66 55 68 81 13 81 13 80 Dist 79 HZ 76 00 11 11 10 10 10 10 10 10 10	88 87 86 85 84 82 82 82 82 82 83 80 84 87 9 79 77 72 50 71 72 50 71 72 50 71 72 72 72 72 72 72 72 72 72 72 72 72 72	85 83 82 81 79 78 2 77 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	87 87 86 85 84 83 80 82 79 81 77 80 76 76 76 76 76 73 etters (72 1000 70 HZ 0B 81 81 81 80 79 79 79 78 77	88 86 85 85 84 81 83 81 82 80 81 79 79 79 79 79 79 79 79 79 79 79 79 79	85 84 83 83 81 83 80 79 79 79 79 79 79 79 79 79 79 79 79 79	90 90 88 87 87 85 84 80 83 80 82 78 81 77 76 75 74 8000 75 74 8000 75 74 84 84 84 84 82 81 79 78	84 82 81 79 78 78 76

	Perfor	mance Numbe	r: DM8428	CI	nange Level:	01					
Sales Model:	3512800	1,174.5	1,575	114	119	Rated	Spee@7(RPM) 1051,8	800 106	106	104
		ROPULS	1,327	112	117					105	103
	1600	8.74 0	1,106	111	116	111 111	104	3KW) ¹⁰⁴ 1,	174.04	105	101
Rating Level:		(HEAVY ₆ , DUT)		110	115			BHP) ₁₀₁ 1,		103	100
	1400	552.6	741	108	113	109	101	100	102	102	99
	1300 100 FXH	AUST Sound	Pressure Da	ta (OBCE)	112 Dist	107 ancę ₀₆	1.5 Mgete	ers (⁹⁹ ₉₈ 4.9	Feet)	100	98
			250		140	105				99	97 06
	ENGINE	ENGINE 268.0	ENGINE 359 197	OVER ALS	125 ¹¹⁰	250 ¹⁰⁵	500 ⁹⁸	1000 ⁹⁶	2000 ⁰⁰	4000 ⁹⁸	8000 ⁹⁶
	SPEED	POWER 146.8 69.1	POWER 93	103	HZ ¹⁰⁷ 105	HZ ¹⁰¹ 99	HZ 97 95	HZ 96 94	HZ 99 97	HZ 92 90	HZ 86
	RPM	BKW	BHP	DB(Å)	DB	DBŨ	DB	DB	DB	DB	DB
	1800	1.174.5	1.575	114	119	115	107	105	106	106	104
	1700	989.4	1.327	112	117	113	105	104	105	105	103
	1600	824.9	1.106	111	116	111	104	102	104	105	101
	1500 1400	679.7 552.6	911 741	110 108	115 113	110 109	103 101	101 100	103 102	103 102	100 99
	1300	442.5	593	108	113	109	101	99	102	102	99 98
	1200	348.0	467	107	112	107	99	99 98	102	99	90 97
	1100800	268.074.5	359575	105100	110 ¹⁰⁸	105102	98 94	96 92	100 93	98 93	96 90
	9001700	146989.4	197,327	103 99	107107	101101	97 92	96 91	<u>9</u> 9 92	az 91	88 89
	700 ¹⁶⁰⁰	69.824.9	9 1 3106	101 ⁹⁸	105 ¹⁰⁵	99 99	95 90	94 90	97 91	₉₀ 91	86 ⁸⁷
	1500	679.7	911	96	104	98	89	88	89	90	85
	1400	552.6	741	95	103	97	88	87	88	89	84
	1300 120 5 XH	AUST Sound	Pressure ₄ Da	ta (OBČF)		95 ance;4	7 Mgete	ers (⁸⁸ / ₈₆ 23.0) Feeet)	88 87	83 82
	1200-	268.0	250			250 ⁹³	500 ⁸⁶	1000 ⁸⁵		4000 ⁸⁶	22 8000 ⁸¹
	ENGINE ⁹⁰⁰	ENGINE 268.0 POWER 146.8 69.1	LINGINE 107	OVERAL	125 ⁹⁸	250 °°	500 00	1000 84	2000 ⁸⁶	4000 ⁹⁰ 79	8000
		POWER 69.1	POWER 93	88	HZ 98 96	HZ 89 87	HZ 86 84	HZ 84 82	HZ ⁸⁴ 82	HZ 79 HZ 77	HZ 75 73
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1800	1,174.5	1.575	100	108	102	94	92	93	93	90
	1700 1600	989.4 824.9	1.327 1,106	99 98	107 105	101 99	92 90	91 90	92 91	91 91	89 87
	1500	679.7	911	96 96	103	99 98	90 89	90 88	91 89	90	85
	1400	552.6	741	90 95	104	90 97	88	87	88	90 89	84
	1300	442.5	593	94	100	95	88	88	88	88	83
	1200	348.0	467	93	99	94	87	86	87	87	82
	1100800	268.174.5	359575	92 94	₉₈ 102	gg 96	86 ⁸⁷	85 86	86 86	86 86	81 ⁸³
	₉₀₀ 1700	146.989.4	197,327	an 92	₉₈ 100	89 94	86 86	₈₄ 84	₈₄ 85	79 85	75 82
	7001600	69824.9	<u>9</u> 13106	88 91	96 98	87 92	84 83	82 83	82 84	77 85	73 80
	1500	679.7	911	90	97	91 90	82	82 80	83 82	83	79
	1400 1300	552.6 442.5	741 593	88 87	96 94	90 88	81 81	Q1	82	82 81	77 76
	120 EXH	AUST Sound	Pressure ₄ Da	ta (OBĞF)	_∂ Ðist	ance ₃₇	15 Mgete	ers (₈ 49.2	2 Feçent)	80	75
		ENGINE 268.0	ENGINE 359	OVER ⁸⁵ L	125 ⁹²	250 ⁸⁶	500 ⁷⁹ ₇₀	40079	080	4000 79	8000 ⁷⁴
	SPEED	DOWED 140.0	POWER 197	83	HZ 91 89	HZ 82 80	HZ 79 HZ 77	u7 ^{/8}	u7 ^{//}	4000 HZ 72 70	H7 ⁶⁸
	RPM	69.1 BKW	BHP 93	81 DB(A)	DB 89	DB 80	DB ^{//}	DB 76	75 DB	DB ⁷⁰	DB 66
	1800	1,174.5	1.575	94	102	96	87	86	86	86	83
	1700	989.4	1.327	92	100	94	86	84	85	85	82
	1600	824.9	1,106	91	98	92	83	83	84	85	80
	1500	679.7	911	90	97	91	82	82	83	83	79
	1400	552.6	741	88	96	90	81	80	82	82	77
	1300	442.5	593	87	94	88	81	81	82	81	76
	1200	348.0	467	86	93	87	80	80	81	80	75
	1100	268.0	359	85	92	86	79 70	79 70	80 77	79 72	74 69
	900 700	146.8 69.1	197 93	83 81	91 89	82 80	79 77	78 76	77 75	72 70	68 66
	700	09.1	93	01	09	00		10	75	10	00

Perfor	nance Number:	DM8428	Cha	nge Level	01			
ENGINE 1100	(HEAVY D& 552.6 552.6 442.5 IICAL Sound P ENGINE 268.0	741 593 ressure Data NGINE ³⁵⁹	104 104 103 102 102 01 (OBCF)01 overal	125 96	Rated Rated Rated tance: 9	Speed (RPM): Power (BKW): Power (BKW): 9 Power (BHP): 93 4 91 4 1 Meters (3 91 4 500 89 4 500 89	99174.5 100 98 97 96 97 96 97 96 96 3,3 Feet ge 94 2000 95 400	98 102 97 101 96 100 95 99 95 98 93 97 93 96 92 8000 95
SPEED 700	POWER 69.P	OWER 93	97	HZ 92	⁹ HZ 9	² HZ ⁸⁸ HZ	93 HZ 94 HZ	$\begin{array}{cccc} 91 & 94 \\ 90 & HZ & 93 \end{array}$
RPM	BKW	BHP	DB(A)	DB	DB	DB DB	DB DB	
1800 1700 1600 1500 1400 1300 1200 1100 1700 900 1700 1600 1500 1400 1300	1.174.5 989.4 824.9 679.7 552.6 442.5 348.0 268.0 ¹ ,174.5 146.8 989.4 69.1 824.9 69.1 824.9 679.7 552.6 442.5	1.575 1.327 1.106 911 741 593 467 359 1,575 197 1,327 93 1,106 911 741 593	104 104 102 102 101 101 100 99 92 97 91 97 90 90 89	99 98 99 97 98 97 96 87 95 86 95 86 94 87 84 86 84 86 84 86	394 928 918 388 588	98 99 97 99 95 98 94 97 93 96 91 96 90 95 88 89 86 90 95 88 85 93 6 87 83 92 5 82 4 3 79 81	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	102 101 99 97 96 86 95 90 85 94 90 84 93 88 83 83 87 83 87 81
	IICAL Sound P				tance: 8	27 Meters (2330 Feet8)4	81 84
ENGINE 900 SPEED 700 RPM	ENGINE 268.0 146.8 POWER 69.₽ BKW	NGINE 359 197 OWER 93 BHP	OVERALI⁸⁸ 87 DB(A)	125 84 HZ 82 DB	3 250 8	2 500 77 1000 76 HZ 75 HZ DB DB	⁸² 2000 ⁸³ 400 81 HZ 82 HZ 80 DB DB	$\frac{79}{78}$ HZ $\frac{82}{81}$
1800 1700 1600 1500 1400 1300 1200 1100 1700 900 1700 1600 1500 1400 1500 1400 MEGLAAN	1.174.5 989.4 824.9 679.7 552.6 442.5 348.0 268.0 ¹ ,174.5 146.8 989.4 69.1 824.9 679.7 552.6 442.5 146.8 989.4 69.1 824.9 679.7 552.6 146.8 989.4 69.1 146.8 1824.9 146.8 1824.9 146.8 1824.9 146.8 1824.9 1825.8 1826.9 18	1.575 1.327 1.106 911 741 593 467 359 1,575 197 1,327 93 1,106 93 1,106 911 741 593 ressure Data	92 92 91 90 89 88 87 85 85 85 85 85 85 84 83 85 85 84 83	87 86 87 85 86 85 84 83 83 82 83 82 83 84 81 82 81 81 81 81 81 81 81 81 81 81 81 81 81	82 8 80 8 79 8 79 7 7	86 87 85 87 83 86 82 85 81 84 79 84 2 78 83 80 2 77 9 84 1 76 9 76 9 76 9 76 7 73 715 <metgars<(< td=""></metgars<(<>	88 86 88 85 86 84 85 83 85 81 84 81 81 82 82 80 81 80 81 82 82 79 80 81 80 78 79 80 81 80 79 80 81 80 79 80 81 80 79 80 81 80 79 80 81 80 79 80 81 80 79 80 81 80 78 79 80 78 9 78 79 79 4972 Feet78 5 5	90 90 88 87 87 85 84 80 83 84 80 82 84 78 81 82 78 81 77 81 76 79 75 78
ENGINE 900 SPEED 700 RPM	ENGINE 268.0 POWER 146.8 BKW	NGINE 359 OWER 197 93 93	OVERALI ⁸² 81 DB(A)	125 79 125 77 HZ 76 DB	250 7	6 500 72 1000 5 HZ 69 HZ DB DB	77 2000 78 400 75 HZ 76 HZ 74 DB DB	$\begin{array}{ccccc} & 74 & 8000 & 78 \\ & 73 & HZ & 76 \\ & 72 & HZ & 75 \end{array}$
1800 1700 1600 1500 1400 1300 1200 1100 900 700	1.174.5 989.4 824.9 679.7 552.6 442.5 348.0 268.0 146.8 69.1	1.575 1.327 1.106 911 741 593 467 359 197 93	87 86 85 85 84 83 83 83 82 81 80	81 81 80 80 80 79 79 79 77 76	82 81 80 79 79 77 77 76 75 73	80 81 79 81 77 80 76 79 73 78 72 77 70 75 69 74	83 80 82 80 80 78 80 78 79 76 78 74 76 73 75 72	84 84 81 81 79 78 78 78 76 75

DM8779-06

	Perfor	mance Number	: DM8429	Ch	ange Level:	01					
Sales Model:	3512800	1,230.5	1,650	114	119	Pat15	Speed	DM).106	800 107	107	105
Sales Wouel.			1,390	113	118	Rateu 114 Datad	Speed in	104, 104	220 5	105	103
		PROPULŚKŐĽ	1,159	111	116		Power ₀ (Bl			105 104	102
Rating Level:	C-RAPUNIC 1400	G (MAXIMUTM2.CO 579.0	200 UN HINU 0495) 110 109	115 114	109	I Power 102	HP): 101, 100	650 103 102	104	100 99
	1300	463.5	622	107	112	107	100	99	102	100	98
		AUST Sound I					1.5 Meter			99	97
	1100 ENGINE900	280.8	377		110	105	98 500 97	97 97 1000	100 2000 99	98 4000 92	96 88 8000
	SPEED700	ENGINE 153.8 I POWER 72.4		OVERA 0 3 101	125 ₁₀₇ HZ 105	250 ₁₀₁ HZ 99	HZ 95	HZ 94	HZ 97	HZ 90	HZ 86
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1800	1.230.5	1.650	114	119	115	107	106	107	107	105
	1700	1,036.6	1,390	113	118	114	106	104	105	105	103
	1600	864.2	1,159	111	116	112	104	103	104	105	102
	1500 1400	712.1 579.0	955 776	110 109	115 114	110 109	103 102	101 100	103 102	104 102	100 99
	1300	463.5	622	109	114	109	102	99	102	102	99 98
	12001800	364,6230.5	489,650	¹⁰⁶ 101	111 109	106 103	99 ₉₄	98 ₉₃	101 93	99 93	97 ₉₀
	11001700	280,8 ₁₃₆ 6	377,390	105 99	110 107	105 101	98 93	97 91	100 ₉₂	98 92	96 ₈₉
	900 1600	153.8864.2	²⁰⁰ 1.159	103 98	107 105	101 99	97 ₉₀	96 90	⁹⁹ 91	92 ₉₂	⁸⁸ 87
	⁷⁰⁰ 1500	^{72.4} 712.1	97 ⁹⁵⁵	101 97	¹⁰⁵ 104	99 98	95 89	94 89	97 90	90 90	86 86
	1400	579.0	776	95	103	97	88	87	88	89	84
	1300	463.5	622	94 • (ODC)53	101	95	88 7 M97au	88 - (877)	89 5 - 87	88 87	83 82
	1100	IAUST Sound I 280.8	377	a (UBC179) 92	9 8	ance ⁹⁴ 93	7 Mêter 86	s (2273.0 86	0 Feêt)	86	81
	ENGINE 00	ENGINE 153.8	ENGINE 206	OVERA	125 98	250 89	500 86	1000 84	2000 84	4000 79	8000 ₇₅
	SPEED700	POWER 72.4		88	HZ 96	HZ 87	HZ 84	HZ 83	HZ 82	HZ 77	HZ 73
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1800	1.230.5 1.036.6	1,650	101 99	109 107	103 101	94 93	93 91	93 92	93 92	90 89
	1700 1600	864.2	1.390 1,159	99 98	107	99	93 90	90	92 91	92 92	89 87
	1500	712.1	955	97	104	98	89	89	90	90	86
	1400	579.0	776	95	103	97	88	87	88	89	84
	1300	463.5	622	94	101	95	88	88	89	88	83
	1200 ₁₈₀₀	364.6230.5	489,650	93 94 92 93	99 102 98 101	94 96 93 05	87 88 86 86	87 86 86 85	87 87 86 85	87 87 86 85	82 84 81 82
	1100 ₁₇₀₀ 900 1600	280,8036.6 153.864.2	377 _{1,390} 206 _{1,159}	92 93 90 91	⁹⁸ 101 98 99	93 95 89 93	86 86 86 84	⁸⁶ 85 84 83	⁸⁶ 85 84 84	⁸⁶ 85 79 85	⁸¹ 82 75 80
	700 1500	72.4712.1	97 955	88 ₉₀	96 97	87 91	84 82	83 82	82 83	77 84	73 79
	1400	579.0	776	89	96	90	81	81	82	82	78
	1300	463.5	622	87	94	88	81	81	82	81	76
		IAUST Sound I				ance ⁸⁷	15 Meter		2 Feet)	80	75
	1100 ENGINE900	280.8 ENGINE 153.8	377 ENGINE 206	85 OVERA&	92 125 91	86 250 82	79 500 79	79 1000 78	80 2000 77	79 4000 72	74 8000 ₆₈
	SPEED700	100.0	POWER 97	81	HZ 89	HZ 80	HZ 77	HZ 76	HZ 75	HZ 70	HZ 66
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1800	1,230.5	1,650	94	102	96	88	86	87	87	84
	1700	1.036.6	1.390	93	101	95	86	85	85	85	82
	1600	864.2	1,159	91 90	99 97	93 91	84 82	83 82	84 83	85 84	80 79
	1500 1400	712.1 579.0	955 776	90 89	97 96	91 90	82 81	82 81	83 82	84 82	79 78
	1300	463.5	622	87	90 94	90 88	81	81	82	81	76
	1200	364.6	489	86	93	87	80	80	81	80	75
	1100	280.8	377	85	92	86	79	79	80	79	74
	900	153.8	206	83 81	91 89	82 80	79 77	78 76	77 75	72 70	68 66
	700	72.4	97	01	09	00	11	10	10	10	00

Sound Performance Number:

	Perforr	nance Nur	nber: DM8429		Change Le	vel:	01									
Sales Model: Application: Rating Level:	MARINGPI	ROPULSIC	230.5 1,6)36.6 1,3)64.2 1,1 M2CIONTINUO 19	90 1 59 1	04 04 03 02	99 98 99 98	Rateg	Spee Powe	er∦jβl	KW):		230.5 ₉₈)	98 97 96 95		102 101 100 99
J	1400	5	579.0 7	76 1	02	97	9		93	,	96	97		95		98
	1300				01	98	9		91		96 052	96		93 93		97 96
	1100		280.8 3		00	96	ance: 94 94		89 89	s (353 94	Feet9 95		93 92		96 95
	ENGINE 900	ENGINE 1		000 OVERAL		95	250 9		88	1000	93	2000 94	4000		8000	
	SPEED 700	POWER		97 9	97 HZ	94	HZ 9	1 HZ	87	ΗZ	92	HZ 93	ΗZ	90	ΗZ	93
	RPM	BKW	BHP	DB(A)	DB		DB	DB		DB		DB	DB		DB	
	1800 1700	1.230.5 1.036.6	1.650 1,390	104 104	99 98		100 99	98 97		99 99		100 100	98 97		102 101	
	1600	864.2	1,390	104	98 99		99 98	97 95		99 98		98	97 96		101	
	1500	712.1	955	102	98		97	94		97		97	95		99	
	1400	579.0	776	102	97		96	93		96		97	95		98	
	1300	463.5	622	101	98		95	91		96		96	93		97	
	1200 1800	364.6,2	230.5 489 1,6	50 101 g	92 97	87	94 8	8 90	86	95	87	96 88	93	86	96	90
	1100 1700	280.8	acc 3// 10	an 100 g	96	86	94 8	7 89	85	94	87	95 88	92	85	95	90
	900 1600 700 1500	153.8 e	864.2 206 1,1 12 1 97 0		95 91 94	87	92 8 91 8		83	93 92	86	94 86 93 85	91 90	84	94 93	88
	1500	72.4 7		55 3	<i>1</i> 0	86	0	5	82	92	85	60	90	83	90	87
	1400 1300				90 39	85 86	84 83		81 79		84 84	85 85		83 81		87 85
			MadoPressure D				ance: 8		/eter	s (233.0			81		84
	1100	2	280.8 3	77 È 8	38	84	8	2	77	- (82	83		80		83
	ENGINE 900			OVERAL		83	250 8		76	1000	81	2000 82	4000	79	8000	02
	SPEED 700 RPM	POWER BKW	72.4 POWER BHP	97 8 DB(A)	35 HZ DB	82	HZ 79 DB	9 HZ DB	75	HZ DB	80	HZ 81 DB	HZ DB	78	HZ DB	81
	1800	1,230.5	1,650	92	87		88	86		87		88	86		90	—
	1700	1.036.6	1.390	92	86		87	85		87		88	85		90	
	1600	864.2	1,159	91	87		86	83		86		86	84		88	
	1500	712.1	955	90	86		85	82		85		85	83		87	
	1400	579.0	776	90	85		84	81		84		85	83		87	
	1300	463.5	622	89 -0 89	86 		83 82 o	79		84 83		85 84 oo	81 81		85	
	1200 1800 1100 1700	364.6	230.5 ⁴⁸⁹ 1,6	50 ⁶⁹ 8	D/ 04	81	~~ °	77	80	82	81	<u> </u>	80	80	84 83	84
	000 1700	280.8,0 153.8 8	377 1,3 36.6 206 1,3		00 00	81	~~ ⁰	1 76	79	81	81	~ 02	79	80	82	84
	⁹⁰⁰ 1600 700 1500	72.4 7	864.2 200 1,1 12.1 97 a	, , , , , , , , , , , , , , , , , , ,	35 82 35 82	81 80	⁸⁰ 8 79 7	·	77 76	80	80 79	82 80 81 80	78	78 78	81	82 81
	1400				34	80	7		76		79	79		77		81
	1300				33	80	7		73		78	79		76		79
			pressure D				ance: 7			rs (2 Feeta		75		78
	1100 ENGINE ₉₀₀	ENGINE 1		77 06 OVERAL {	32 4 125	79 77	250 7		72 70	1000	77 75	78 2000 76	4000	74 73	8000	78 76
	SPEED 700				30 HZ	76	HZ 7		69	ΗZ	74	HZ 75	ΗZ	72	ΗZ	75
	RPM	BKW	BHP	DB(A)	DB		DB	DB		DB		DB	DB		DB	
	1800	1,230.5	1,650	87	81		82	80		81		83	80		84	
	1700	1.036.6	1.390	86	81		81	79 77		81		82	80		84	
	1600 1500	864.2 712.1	1,159 955	85 85	81 80		80 79	77 76		80 79		80 80	78 78		82 81	
	1400	579.0	955 776	83 84	80		79 79	76		79 79		80 79	78		81	
				0-1				10								
	1300	463.5	622	83	80		77	73		78		79	76		79	
			622 489	83	80 79		77 77	73 72		78 77		79 78	75		79 78	
	1300 1200 1100	463.5 364.6 280.8	489 377	83 82	79 79		77 76	72 72		77 77		78 78	75 74		78 78	
	1300 1200	463.5 364.6	489	83	79		77	72		77		78	75		78	

Sound Performance Number:

DM8779-06

	Perfo	rmance Numbe	r: DM8466	Cł	nange Level:	03					
Sales Model:	35112600	1,044.0	1,400	113	118	Rátêd	Speé@	RPM) ¹⁰⁴ 1	, 600 ¹⁰⁶	106	103
		PROPULS	1,154	111	116	Rated	Power (1		,044. ¹⁰⁴	105	102
		G (UNRESTERIC			115			BHP)1001		103	100
Rating Level.	1200	440.4	591	107	114 112	107	1 FOWN⊜⊵(100	99	, 4 00 103 102	102 100	100 98
	1100	339.2	455	107	111	107	99	97	102	99	97
		HAUST Sound	Pressure Da	ta (OBQE)	1 Deist	ance ₀₃	1.5 Mete		9 Feet)	94	89
	900 ENGINE	ENGINE 185.8 130.5	ENGINE 475		125	250 102	500 ⁹⁸ 97	1000 ₉₆	2000 ₉₉	4000 ₉₂	8000
	SPEE	POWER 87.4	POWER 175		125 ₁₀₇ HZ ₁₀₆	HZ100	нг ₉₆	HZ 95	HZ 98	HZ ₉₁	8000 ₈₇ HZ 86
	RPM	BKW	BHP	102 DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1.044.0	1.400	113	118	113	106	104	106	106	103
	1500	860.2	1,154	111	116	112	104	103	104	105	102
	1400	699.4	938	110	115	110	103	101	103	103	100
	1300	560.0	751	109	114	109	102	100	103	102	100
	1200	440.4	591	107	112	107	100	99	102	100	98
	1100	339.2	455	106	111	106	99	97 08	101	99	97 80
	1000 900 ¹ 600	254.9 185,860.2	342 249400	105 104 99	109 108 107 105	103 102 101	99 98 92	98 97 91	101 100 92	94 93 93	89 88 88
	900 ¹⁵⁰⁰ 800 ¹⁵⁰⁰	185,814.0 130,5 	249 ⁴⁰⁰ 175 175 17938	104 103 98	108	102 99	98 97 90	97 96 90	99 91	93 92 92	87 87
	700 ¹⁴⁰⁰ 1300	87%	11/	104 98 103 98 102 96	108 107 ¹⁰⁵ 106 ₁₀₂	102 99 101 99 100 98	oe 89	os 88	og 90	o1 90	86 85
		560.0	/51	95	102	90	89	89	90	89	84
	1200	440.4	591	94	100	95	88	88	88	88	83
	1100	339.2	455	93	99	94	87	86	8 7	87	82
		HAUST Speared		• •	00	ancen	7 Maete		.0 Feest)	80	76
	ENGINE		ENGINE 249 175		125 ₉₇	250 ⁸⁹	500 ⁸⁶ 85	1000 ⁸⁵ 84	2000 ⁸⁴	4000 79 78	8000 ₇₄
	SPEEPOO	POWER 87.4	POWER 117	88	нz ₉₆	нz ₈₇	нz 84	HZ 83	HZ 82	HZ_{77}^{70}	HZ 73
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1,044.0	1,400	99	107	101	92	91	92	93	88
	1500	860.2	1.154	98	105	99	90	90	91	92	87
	1400	699.4	938	96	104	98	89	88	90	90	85
	1300	560.0	751	95	102	96	89	89	90	89	84
	1200	440.4	591	94	100	95	88 87	88	88 87	88	83
	1100	339.2	455	93 91	99 99	94 90	87 87	86 86	87 85	87 80	82 76
	1000 9001600 8001500 7001400 1300	254.9 1044.0 185.8	342 249400	90 93 90 93	99 98 100	90 89 94	86 85	85 85	84 86	79 86	75 82
	8001500	130,5 130,5 876,99.4	249 ⁴⁰⁰ 1154 175 14-938	80 91	07 99	88 93	85 84	84 83	83 84	78 85	74 80
	7001400	87499.4	11/	88 90	oe 97	₉₇ 91	₉₄ 82	₂₂ 82	83	77 84	73 /9
	1300	560.0	751	89	95	90	83	82	83	83	78
	1200	440.4	591	87	94	88	81	81	82	81	76
	1100 100 FX	339.2 HAUST Speared	455 Prossuro Da	86 ta (OB@E)	93 d Diet	87 ances:4	80 15 Maete	80 are (7 /19	81 .2 Ferent)	80 74	75 70
			2/0	· · · /				•	. ,		
	ENGINE	ENGINE 130 F	ENGINE 175	over84	125 ₉₁	250 ⁸³ ₈₂	500 79	1000 ₇₇	2000 78	4000 73 72	8000 ⁶⁹
	SPEEP00 RPM	POWER 87.4 BKW	POWER 117 BHP	82 DB(A)	HZ 90 DB	HZ 81 DB	HZ 78 DB	HZ 76 DB	HZ ₇₆ DB	HZ 71 DB	HZ 67 DB
	1600	1,044.0	1,400	93	100	94	85	85	86	86	82
	1500	860.2	1.154	91	99	93	84	83	84	85	80
	1400	699.4	938	90	97	91	82	82	83	84	79
	1300	560.0	751	89	95	90	83	82	83	83	78
	1200	440.4	591	87	94	88	81	81	82	81	76
	1100	339.2	455	86	93	87	80	80	81	80	75
	1000	254.9	342	85	93	84	81	79	79	74	70
	900	185.8	249	84	92	83	80	78	78	73	69
	800	130.5	175	83	91	82	79	77	77	72	68
	700	87.4	117	82	90	81	78	76	76	71	67

	Perform	nance Numbe	r: DM8466	C	hange Level:	03					
Sales Model:		1,044.0	1,400	103	99		Spe@d (I			96	100
Application:	MAR BE PR	ROPULS®	1,154	102	98	Rated	Powers (E	3 KW) ⁹⁷ 1	.044.87	95	99
Rating Level:	A RAJING (UOUS ₁₀₁	97 98	Bated	93 (Powger (, 96 BHP)ბი 1	400 97	95 93	98 97
Rating Level.	1200	440.4	591	101	98 97	94	90	95 · ·	96 , 100 98	93 93	97 96
	1100	339.2	455	100	96	94	89	04	05	92	95
	MEGHANI	CAL Sound	Pressure⊉at	ta (OBĜĴ)	₉ Dista	anceja	1 Meste		3 Fejet)	91	95
F	NGINE 800	ENGINE 185.8 POWER 130.5 87.4	ENGINE 249	OVERALL	125 ⁹⁵	250 92	500 ⁸⁸	1000 ⁹³	2000 94	4000 91	8000 ⁹⁴
S	SPEED	POWER ^{130.5}	DOWED 1/5		HZ ₉₅ HZ ₉₄	HZ ₉₁	HZ ⁸⁸ HZ ⁸⁷	HZ ₉₂	HZ ₉₃	HZ ₉₀	HZ ₉₃
-	RPM	BKW 87.4	BHP 117	97 DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1.044.0	1.400	103	99	98	95	98	98	96	100
	1500	860.2	1,154	102	98	97	94	97	97	95	99
	1400	699.4	938	102	97	96	93	96	97	95	98
	1300	560.0	751	101	98	95	91	96	96	93	97
	1200	440.4	591	101	97	94	90	95	96	93	96
	1100	339.2	455	100	96	94	89	94	95	92	95
	1000 900 ¹ 600	254.9 185044.0	342 249 ⁴⁰⁰	99 99 91	96 95 87	93 92 86	89 88 83	94 93 86	95 94 86	91 91 ⁸⁴	95 94 88
	8001500	130860.2	175154	<u>08</u> 90	95 86 95 86	02 02	88 82	02 02	og 85	00 83	Q1 81
	700 ¹⁴⁰⁰	87699.4	117 ⁹³⁸	97 ⁹⁰	94 85	91 ⁸⁴	₈₇ 81	92 84	93 85	90 ⁸³	93 ⁸⁷
	1300	560.0	751	89	86	83	79	84	85	81	85
	1200	440.4	591	89	85	82	78	83	84	81	84
	1100 MEGHANI		⁴⁵⁵ Pressure₄⊉at	ta (OB ₆ #)	⁸⁴ 8 ⊉ist a	82 ance:	77 7 M∳¢te	ers (82 82 23	.0 Feget)	80 80	83 83
F	NGINE	ENGINE 185.8	ENGINE 249	OVER 87	125 ⁸³	250 ⁸⁰ нz ₇₉	500 76	1000 81	2000 ⁸² нz ₈₁	4000 ⁷⁹ нz ₇₈	8000 ⁸²
S	PEED	DOW/ED	DOWED 1/5		HZ ₈₂	HZ_	HZ ₇₅	HZ ₈₀	HZ 81	HZ	HZ ₈₁
-	RPM	BKW 87.4	BHP 117	85 DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1,044.0	1,400	91	87	86	83	86	86	84	88
	1500	860.2	1.154	90	86	85	82	85	85	83	87
	1400	699.4	938	90	85	84	81	84	85	83	87
	1300	560.0	751	89	86	83	79	84	85	81	85
	1200	440.4	591	89	85 84	82 82	78	83	84 83	81 80	84 83
	1100 1000	339.2 254.9	455 342	88 87	84 84	Q1	77 77	82 82	83 83	80 80	83 83
	001600	165044.0	2/10400	07 85	83 81	00 80	76 77	81 ⁸⁰	82 ⁸⁰	70 78	82 82
	8005 pus	130 ^{860.2}	175154	og 85	02 80	en 79	76 ⁷⁶	81 ⁷⁹	81 80	70 /8	82 ⁸¹
	700 ¹⁴⁰⁰	87 ^{699.4}	117 ⁹³⁸	85 ⁸⁴	82 80	79 79	75 76	₈₀ 79	81 79	78 //	81 81
	1300	560.0 440.4	751 591	83 83	80 79	77	73 72	78 77	79 78	76 75	79
	1200 1100				79 79	76			78 78	75 74	78 78
	MEGHANI	CAL South d	⁴⁵⁵ Pressure₄⊉at		₇ ₽ista	ance ₅	⁷² 15 M∳ete		.2 Fejet)	74	77
E		ENGINE 185.8	ENGINE 249 175	OVER	125 ⁷⁷	250 ⁷⁵ HZ ₇₃	500 ⁷⁰ HZ ₆₉	1000 ⁷⁵ Н2 ₇₅ Н2 ₇₄	2000 ⁷⁶	4000 ⁷³ HZ ₇₂	8000 ⁷⁶ HZ ₇₅
S	SPEED	POWER 87.4	POWER 117	80	HZ ₇₆	HZ_{73}^{74}	HZ ⁷⁰	HZ_{74}^{73}	2000 HZ ₇₅	HZ_{72}^{2}	HZ_{75}^{70}
	RPM	BKW	BHP	DB(Ă)	DB	DB	DB	DB	DB	DB	DB
	1600	1,044.0	1,400	85	81	80	77	80	80	78	82
	1500	860.2	1.154	85	80	79	76	79	80	78	81
	1400	699.4	938	84	80	79 77	76	79 70	79 70	77	81
	1300 1200	560.0 440.4	751 591	83 83	80 79	77 77	73 72	78 77	79 78	76 75	79 78
	1200	440.4 339.2	455	83	79 79	77 76	72 72	77	78 78	75 74	78 78
	1000	254.9	342	82	78	70 75	71	76	77	74	77
	900	185.8	249	81	70	75	70	75	76	73	76
	800	130.5	175	80	77	74	70	75	76	72	76
	700	87.4	117	80	76	73	69	74	75	72	75

	Perfor	mance Numbe	er: DM8467	Ch	ange Level:	04					
Sales Model:	351/260	1,118.5	1,500	113	118	Rated	Speeds	(RPM) 1051	.600 106	107	104
		ROPULSHON	1,236	112	117		•	BKW) ¹⁰³ 1		107	104
				110	115	D ¹¹¹	103	(BHP) ¹⁰² ₁₀₀ 1	,500 ¹⁰³ ₁₀₃	104	101
Rating Level:		6 (HEAVY ^{749.3} T		109	114			100	100	102	100
	1200	471.9	633	108	113	108	101	99	102	101	99
		AUST Sound	Pressure Dat	a (OBCE)	Dist	ance ¹⁰⁶	1.5 Met	ers (⁹⁸ 4.	9 Feet)	99 94	97 90
		ENGINE ^{199.1}		OVERIAL	125 ¹⁰⁸	250 102	500 ⁹⁸	1000 ⁹⁷	2000 ⁰⁰	94 4000 ⁹³	90 8000 ⁸⁸
I		POWER ^{139.8}	ENGINE ²⁶⁷ POWER ¹⁸⁷	103	107	101	97			4000 ⁹⁰ HZ ⁹²	117 87
	RPM	BKW 93.7	BHP 126	102 DB(A)	HZ107 DB ¹⁰⁶	HZ101 DB ¹⁰⁰	HZ 96 DB	HZ 00 DB 95	HZ 00 DB 98	DB ⁹¹	DB ⁸⁶
	1600	1.118.5	1.500	113	118	114	106	105	106	107	104
	1500	921.6	1,236	113	116	114	105	105	105	107	104
	1400	749.3	1,005	110	115	111	103	102	103	103	101
	1300	599.9	805	109	114	109	102	100	103	102	100
	1200	471.9	633	108	113	108	101	99	102	101	99
	1100	363.5	487	106	111	106	99	98	101	99	97
	1000	273.1	366	105	109	103	99	98	101	94	90
	9001600	199.118.5	267,500	104100	108107	102101	98 92	97 92	100 93	93 94	88 89
	8001500	1399821.6	1817,236	103 98	107106	101100	97 91	96 90	99 91	92 92	87 87
	7001400 1300	93 <u>7</u> 49.3 599.9	1 <i>2</i> 6005 805	102 97 96	106104 102	100 98 97	96 89 90	95 89 89	98 90 90	91 91 90	86 86 85
	1200	471.9	633	94	102	95	88	88	89	88	83
		<u>.</u>								87	82
	1100 100 5 XH		Pressure ⁴⁸⁷ 866	а (ОВС ₂)		ance ⁹⁴	7 Nget		.0 Feet)	81	77
	ENGIN ^{E00}	ENGINE 199.1	ENGINE 267	OVERALL	125 ⁹⁹	250 ⁹⁰	500 ⁸⁷	1000 ⁸⁵	2000 ⁸⁵	4000 ⁸⁰	8000 ⁷⁶
	SPEE ⁸⁰⁰	POWER 139.8	POWER 187	90	HZ 98	HZ ⁸⁹	HZ 86		HZ ⁸⁴	HZ 79	HZ 74
	RPM	BKW 93.7	BHP 126	89 DB(A)	DB 97	HZ 88 DB	HZ 85 DB	HZ 83 DB	HZ 83 DB	HZ 78 DB	DB 73
	1600	1,118.5	1,500	100	107	101	92	92	93	94	89
	1500	921.6	1.236	98	106	100	91	90	91	92	87
	1400	749.3	1.005	97	104	98	89	89	90	91	86
	1300	599.9	805	96 94	102	97	90 88	89	90	90 88	85
	1200 1100	471.9 363.5	633 487	94 93	101 99	95 94	88 87	88 87	89 87	88 87	83 82
	1000	273.1	366	93 92	100	94 91	88	86	86	81	82 77
	9001600	1919,1118.5	2617,500	91 93	99 101	90 95	87 86	85 85	85 86	80 87	76 82
	8001500	139921.6	187,236	90 92	98 99	89 93	86 84	84 84	84 85	79 85	74 81
	7001400	93749.3	126005	89 90	97 98	88 92	85 83	83 82	83 83	78 84	73 79
	1300	599.9	805	89	95	90	83	83	83	83	78
	1200	471.9	633	88	94	89	82	81	82	82	77
	1000	AUST Sound	Pressure 366			ance ⁸⁷	15 Mget			80 74	75 70
I		ENGINE 199.1	ENGINE 267	OVERAL 83	125 ⁹²	250 83	500 ⁸⁰	1000 ⁷⁸	2000 78	4000 73	8000 ⁶⁹
	SPEE ⁸⁰⁰	POWER 139.8 93.7	FOWER 126		HZ 91	HZ ⁸²	HZ 79 78	HZ_{76}^{77}	HZ 77	HZ 72	HZ 68
	RPM ⁷⁰⁰	BKW	BHP	DB(Å)	HZ 90 DB	HZ 81 DB 81	HZ 78 DB 78	HZ 77 DB ⁷⁶	HZ 76 DB 76	HZ 71 DB	DB ⁶⁷
	1600	1,118.5	1,500	93	101	95	86	85	86	87	82
	1500	921.6	1.236	92	99	93	84	84	85	85	81
	1400 1300	749.3 599.9	1.005 805	90 89	98 95	92 90	83 83	82 83	83 83	84 83	79 78
	1200	599.9 471.9	633	88	95 94	90 89	82	81	82	82	76 77
	1100	363.5	487	86	93	87	80	80	81	80	75
	1000	273.1	366	85	93	84	81	80	79	74	70
	900	199.1	267	84	92	83	80	78	78	73	69
	800	139.8	187	83	91	82	79	77	77	72	68
	700	93.7	126	82	90	81	78	76	76	71	67

Sound Performance Number:

DM8779-06

	Performanc	ce Number:	DM8467	Chang	e Level:	04					
Sales Model: 3	51/2600	1,118.5	1.500	103	99	Rated	Speed (RP	PM)98 1.6	600 98	96	100
Application: M			1,236	102	98	Dated B	Powof (BK	MA 97 1	18 87	95	99
			1,005	102	97		Power (BK	96	-00.97	95	98
Rating Level: B			805	101	98		Power (Bl			93	97
	1200	471.9	633	101	97	94	90	95	96	93	96
		Sound Pr	487 essure Data	(OBGF)	96 Dista	94 ance ₃	1 Meters	6 (⁹⁴ ₉₄ 3.3	95 Feget)	92	95
					95.000			03	· -955- /	91 01	95 04
EN		SINE 199.1 EN	GINE 107	overägl	125 ⁹⁵	250 ⁹²	500 ⁸⁸	1000 ⁹³	2000 ⁹⁴	4000 91	8000 ⁹⁴
		937	126	97	HZ ⁹⁵ HZ ⁹⁴	HZ 92 91	HZ 87	HZ 92 92	HZ 93	HZ 90	HZ ⁹⁴ 93
		(W CON	BHP	DB(Ă)	DB	DB	DB	DR	DB	DB	DB
		1.118.5	1.500	103	99	98	95	98	98	96	100
	500	921.6 749.3	1,236	102	98 97	97 96		97 96	97 97	95 95	99 98
	400 300	749.3 599.9	1.005 805	102 101	97 98	96 95		96 96	97 96	95 93	98 97
	200	471.9	633	101	98 97	95 94	90	90 95	90 96	93 93	97 96
	100	363.5	487	100	96	94 94	90 89	93 94	90 95	93 92	90 95
	000	273.1	366	99	96	93	89	94	95	91	95 95
C	₉₀₀ 1600	199.418.5	26 ^{17,500}	99 91	95 87	92 86	88 83	93 86	94 86	91 ⁸⁴	94 88
e P	3001500	139921.6	187,236	98 90	95 86	92 85	88 82	92 85	93 85	90 83	94 87
	700 ¹ 400	93.749.3	126005	97 90	94 85	91 ⁸⁴	87 81	92 ⁸⁴	93 85	90 ⁸³	93 87
	1300	599.9	805	89	86	83	79	84	85	81	85
	1200	471.9	633	89	85	82	78	83	84	81	84
		363.5	essure₀₽ata		84 a ⊉ ista	82	7 Meters	82 8 2 3.0	East)	80	83
					841516	111C68-1			Feet)	80	83
EN		SINE 199.1 EN	GINE 267 187	overål	125 ⁸³	250 ⁸⁰	500 ⁷⁶	1000 ⁸¹	2000 ⁸²	4000 ⁷⁹	8000 ⁸²
SP	PEED 00 POV		WER 107 126	85	HZ ⁸³ HZ ⁸²	HZ ⁸⁰ 79	HZ 76 HZ 75	HZ ⁸¹ ₈₀	HZ ⁸¹ ₈₁	HZ 78 HZ 78	HZ ⁸² 81
R	PM BK	(W 95.7	BHP	DB(Å)	DB	DB	DB	DB	DB	DB	DB
1	600 1	1,118.5	1,500	91	87	86	83	86	86	84	88
1	500	921.6	1.236	90	86	85	82	85	85	83	87
	400	749.3	1.005	90	85	84		84	85	83	87
	300	599.9	805	89	86	83	79	84	85	81	85
	200	471.9	633	89	85	82		83	84	81	84
	100	363.5	487	88	84	82		82	83	80	83
1	000 900 ¹ 600	273.1 199.118.5	366 26 ¹ 7500	87 87 ⁸⁵	84 83 81	81 80 ⁸⁰		82 81 80	83 82 80	80 79 78	83 82 82
ç	300 ¹ 500	199.110.0 139.921.6	187,236	87 00 86 85	83 81 83 80	80 00 80 79	10	01	02	79 78 78 78	82 81 82 81
	₇₀₀ 1400	139 :8 1.0 937 / 49.3	126005	85 84	83 80 82 80	80 79 79 79	75 76	81 ⁷⁹ 80 ⁷⁹	81 ⁸⁰ 81 79	78 70 78 77	82 81
1	1300	599.9	805	83	80	79 70	73	78	79	76	79
	1200	471.9	633	83	79	77	72	77	78	75	78
		363.5	487	(OP OP OP OP)	79 Diete	76 anc e/ 5	72	(7740.0	78	74	78
	MECHANICA	L Somana Pro	essured				15 Mę́ters			74	77
EN		SINE 199.1 EN	GINE 267		125 ⁷⁷	250 75	500 70	1000 ⁷⁵	2000 ⁷⁶	4000 ⁷³	8000 ⁷⁶
SP			WER 187 126	80	HZ ⁷⁷ HZ ⁷⁶	HZ 74 73	HZ 69	HZ 75 HZ 74	2000 HZ 76 75	4000 HZ 72 72	ни ⁷⁶ ни ⁷⁶
R	PM BK	(W 95.7	BHP	DB(Å)	DB	DB	DB	DB (DB	DB	DB
1	600 1	1,118.5	1,500	85	81	80	77	80	80	78	82
	500	921.6	1.236	85	80	79		79	80	78	81
	400	749.3	1.005	84	80	79		79	79	77	81
	300	599.9	805	83	80	77		78	79	76	79
	200	471.9	633	83	79	77		77	78	75	78
	100	363.5	487	82	79	76		77	78	74	78
	000	273.1	366	82	78	75		76	77	74	77
	000	199.1	267	81	77	75		75	76	73	76
	300	139.8	187	80	77 76	74 72		75 74	76 75	72	76 75
1	700	93.7	126	80	0	73	09	14	75	72	75

	Perfor	mance Numbe	er: DM8468	Ch	ange Level:	03					
Sales Model:	351126000	1,193.0	1,600	114	119	Rated	Spee@7(F	RPM)1 051	.600 107	107	104
		ROPULS	1,318	112	117	Patrad	Power (E	104 1	103 105	106	103
Application.				、 111	116			102	, 133.0 600 ¹⁰⁴	104	101
Rating Level:					114		l Power (l			102	100
	1200	503.3	675	108	113	108	101	99	102	101	99
	1100 100 EXH	AUST South	Pressure Dat		112 ₁Dvist	107 anc ę ġ3	1.5 Mgete	rs (₉₈ 4.9	9 Feet)	100 94	98 90
-		212.3	005			250 ¹⁰²					8000 ⁸⁹
		ENGINE 212.3 POWER 149.1 99.9	ENGINE 200		125 ¹⁰⁸ HZ ¹⁰⁷	250	500 98	1000 ⁹⁷	2000 00	4000 ⁹³ HZ 92 91	8000°
	ENGINE SPEED	POWER 99.9	POWER 134	102	HZ ₁₀₆	HZ ¹⁰¹ HZ ¹⁰⁰	HZ 96	н г ₉₅	2000 ⁰⁰ нг ₉₉	HZ 91	HZ 88 HZ 87
	RPIN	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1.193.0	1.600	114 112	119 117	114 113	107 105	105 104	107 105	107 106	104 103
	1500 1400	983.0 799.2	1,318 1.072	112	117	113	105	104	105	106	103
	1300	639.9	858	109	114	109	104	102	104	104	100
	1200	503.3	675	108	113	108	101	99	102	101	99
	1100	387.7	520	107	112	107	100	98	101	100	98
	1000	291.3	391	105	109	103	99	98	101	94	90
	900 ¹⁶⁰⁰	212.393.0	285600	103 104 ¹⁰⁰	108108	102102	98 93	97 92 97 01	100 93	93 94 93 02	89 89
	800 ¹ 500 700 ¹ 400	149983.0 99799.2	200318 134072	103 99 102 97	107106 106105	101 ¹⁰⁰ 100 ⁹⁹	97 91 96 90	96 91 95 89	99 92 98 90	92 93 91 91	88 88 87 86
	1300	639.9	134072	102 97	106103	100 ⁹³ 97	96 90 90	95 ⁸⁹ 90	98 90 90	91 91 90	87 ⁸⁶ 85
	1200	503.3	675	95	101	96	89	88	89	89	84
	110 <u>0</u>	387.7	Pressure 9	$(22)^{93}$	100	94	87	,87	6 6 8	87	82
	100 EXH				1 Wist	ance ₁	7 Mete			81	77
I	ENGINE SPEED	ENGINE 212.3	ENGINE 285	OVERALL	125 ⁹⁹ HZ 98 97	250 ⁹⁰ 89	500 ⁸⁷	1000 ⁸⁵	2000 ⁸⁵	4000 ⁸⁰ HZ 79 78	8000 ⁷⁶
	SPEED	POWER 149.1 99.9	POWER 200 134	90 89	HZ 98	HZ 88	HZ 85	HZ ⁸⁴ 83	HZ 84 BB	HZ_{78}^{79}	HZ_{74}^{75}
	RPM	BKW	BHP	DB(Ă)	DB	DB	DB	DB	DB	DB '	DB [']
	1600	1.193.0	1.600	100	108	102	93	92	93	94	89
	1500	983.0	1.318	99	106	100	91	91	92	93	88
	1400 1300	799.2 639.9	1,072 858	97 96	105 102	99 97	90 90	89 90	90 90	91 90	86 85
	1200	503.3	675	90 95	102	96	90 89	88	90 89	89	83 84
	1100	387.7	520	93	100	94	87	87	88	87	82
	1000	291.3	391	92	100	01	88	86	86	81	77
	9001600	212.393.0	285600	91 ⁹⁴	99 101	90 ⁹⁵	87 86	85 86	85 87	80 ⁸⁷	76 ⁸³
	8001500	149983.0	200318	90 92 91	98 100 98 100	89 94	86 85 85 83	84 84	84 85 83 84	79 86	75 81 74 80
	700 ¹⁴⁰⁰ 1300	99.799.2 639.9	134072 858	89 91 89	97 98 96	88 92 90	85 83 83	83 83 83	83 ⁸⁴ 84	78 84 83	74 ⁸⁰ 78
	1200	503.3	675	88	94	89	82	82	82	82	77
	110 <u>0</u>	387.7	520	(0 D 87)	93	88	81	80	e = ⁸¹	81	76
	100 FXH	AUSI Sound	Pressure			ance ₃₄	15 Mete			74	70
-	900		ENCINE 285		125 92 91	250 ⁸³	500 ⁸⁰ ₇₉	1000 ⁷⁹	2000 ⁷⁸	4000 ⁷³	8000 ⁶⁹
	ENGINE	ENGINE 140.1		OVERAL	01	20000					
	ENGINE SPEED	ENGINE 212.3 POWER 99.9	POWER 200		HZ 91	HZ 82 HZ 81	HZ 79 HZ 78	HZ_{77}^{78}	HZ 76	HZ_{71}^{72}	HZ 67
	RPM	BKW	POWER 200 134 BHP	82 DB(A)	2 90 DB	HZ 81 DB	HZ 78 DB	HZ 78 DB	HZ 76 DB	HZ 72 DB	HZ 67 DB
	RPM 1600	POWER 99.9 BKW 1,193.0	POWER 200 134 BHP 1,600	82 DB(A) 94	DB 101	HZ 81 DB 95	HZ 78 DB 86	HZ 77 DB 86	HZ 76 DB 87	HZ 72 DB 87	HZ 67 DB 83
	RPM 1600 1500	POWER 99.9 BKW 1.193.0 983.0	200 POWER BHP 1,600 1.318	82 DB(A) 94 92	101 100	HZ 81 DB 95 94	HZ 78 DB 86 85	HZ 78 DB 86 84	HZ 76 DB 87 85	HZ 72 DB 87 86	HZ 67 DB 83 81
	RPM 1600 1500 1400	POWER 99.9 BKW 1,193.0 983.0 799.2	POWER 200 134 BHP 1.600 1.318 1.072	82 DB(A) 94 92 91	101 98	HZ 81 DB 95 94 92	HZ 78 DB 86 85 83	HZ 78 DB 86 84 83	HZ 76 DB 87 85 84	HZ 72 DB 87 86 84	HZ 67 DB 83 81 80
	RPM 1600 1500 1400 1300	POWER 99.9 BKW 1,193.0 983.0 799.2 639.9	200 134 BHP 1.600 1.318 1.072 858	82 DB(A) 94 92 91 89	101 100 98 96	HZ 81 DB 95 94 92 90	HZ 78 DB 86 85 83 83 83	HZ 78 DB 86 84 83 83	HZ 76 DB 87 85 84 84	HZ 72 DB 87 86 84 83	HZ 67 DB 83 81 80 78
	RPM 1600 1500 1400	POWER 99.9 BKW 1,193.0 983.0 799.2	POWER 200 134 BHP 1.600 1.318 1.072	82 DB(A) 94 92 91	101 98	HZ 81 DB 95 94 92	HZ 78 DB 86 85 83	HZ 78 DB 86 84 83	HZ 76 DB 87 85 84	HZ 72 DB 87 86 84	HZ 67 DB 83 81 80
	SPEED O RPM 1600 1500 1400 1300 1200	POWER 99.9 BKW 1.193.0 983.0 799.2 639.9 503.3	POWER 200 BHP 1.34 1.600 1.318 1.072 858 675 675	82 DB(A) 94 92 91 89 88	101 100 98 96 94	HZ 81 DB 95 94 92 90 89	HZ 78 DB 86 85 83 83 83 82	HZ 70 DB 86 84 83 83 83 82	HZ 76 DB 87 85 84 84 84 82	HZ 72 DB 87 86 84 83 82	HZ 67 DB 83 81 80 78 77
	SPEED0 RPM 1600 1500 1400 1300 1200 1100 900	POWER 99.9 BKW 1.193.0 983.0 799.2 639.9 503.3 387.7 291.3 212.3	POWER 200 BHP 134 1.600 1.318 1.072 858 675 520 391 285	82 DB(A) 94 92 91 89 88 87 85 85 84	PZ 90 DB 101 100 98 96 94 93 93 93 92	HZ 81 DB 95 94 92 90 89 88 88 84 83	HZ 78 DB 86 85 83 83 83 82 81 81 81 80	HZ 78 DB 86 84 83 83 82 80 80 79	HZ 76 DB 87 85 84 84 84 82 81 79 78	HZ 72 TDB 87 86 84 83 82 81 74 73	HZ 67 DB 83 81 80 78 77 76 70 69
	SPEED0 RPM 1600 1500 1400 1300 1200 1100 1000	POWER 99.9 BKW 1.193.0 983.0 799.2 639.9 503.3 387.7 291.3	ENGINE 200 POWER 134 BHP 1.600 1.318 1.072 858 675 520 391	82 DB(A) 94 92 91 89 88 88 87 85	PZ 90 DB 101 100 98 96 94 93 93	HZ 81 DB 95 94 92 90 89 88 88 84	HZ 78 DB 86 85 83 83 83 82 81 81	HZ 78 77 DB 86 84 83 83 83 82 80 80 80	HZ 76 DB 87 85 84 84 84 82 81 79	HZ 72 TDB 87 86 84 83 82 81 74	HZ 67 DB 83 81 80 78 77 76 70

Sound Performance Number:

DM8779-06

	Perfor	mance Numbe	r: DM8468	Cł	nange Level:	03					
Sales Model:		1,193.0	1,600	103	99		Speed (F			96	100
Application:	MAREP	ROPULS	1,318	102	98	Rated	Power3(B	KW) ⁹⁷ 1	,193. <u>07</u>	95	99
			2011012072	102	97	Rated	l Power (I	3HP) 50 1	600 %	95	98
Rating Level.	1200	503.3	675) 101 101	98 97	94	90	95 95	,000 g ₆ 96	93 93	97 96
							90 89	95 94	96 95	93 92	96 95
	MEGHAN	NICAL Sound	Pressure	ta (OBGF)	d Dista	94 ance ₃ 3	1 Meete	rs (₉₄ 3.)	3 Feget)	92 91	95 95
		212.3	ENGINE 285	OVERAL	125 ⁹⁵	25092	88	1000 ⁹³	2000 ⁹⁴	4000 ⁹¹	8000 ⁹⁴
	SPEED	POWER 99.9	POWER 200 134	98 97	HZ 95 94	HZ 92 HZ 91	500 ⁸⁸ HZ ₈₇	HZ 92	HZ 93	HZ 90	HZ 94 93
	RPM	BKW ^{99.9}	BHP	DB(Å)	DB	DB	DB°'	DB	DB	DB	DB
	1600	1.193.0	1.600	103	99	98	95	98	98	96	100
	1500	983.0	1,318	102	98	97	94	97	97	95	99
	1400	799.2	1,072	102	97	96	93	96	97	95	98
	1300	639.9	858	101	98	95	91	96	96	93	97
	1200	503.3	675	101	97	94	90	95	96	93	96
	1100	387.7	520	100	96	94	89	94	95	92	95
	1000	291.3	391	99	96	93	89	94	95	91	95
	9001600	212.393.0	285600	99 91	95 87	92 86	88 83	93 86	94 86	91 ⁸⁴	94 88
	8001500	149983.0	200318	98 90	95 86	92 85	88 82	92 85	93 85	90 83	94 87
	7001400	99799.2	134072	97 90	94 85	91 ⁸⁴	87 81	92 84	93 85	90 ⁸³	93 87
	1300	639.9	858	89	86	83	79	84	85	81	85
	1200	503.3	675	89	85	82	78	83	84	81 80	84
	МБ6НАМ		⁵²⁰ Pressure	ta (OBĜF)		82 ance ₃₁	77 7 Myşte	102		80	83 83
		ENGINE 212.3	ENGINE 285	OVER	125 ⁸³	250 ⁸⁰	500 76	1000 ⁸¹	2000 82	4000 ⁷⁹	8000 ⁸²
	SPEED		DOWED 200		HZ 83 HZ 82	HZ 79	HZ 75	HZ 81 80	HZ 81 81	HZ 78 HZ 78	HZ 82 81
	RPM	BKW	BHP 134	85 DB(A)	DB 82	DB	DB	DB 80	DB	DB 78	DB 81
	1600	1,193.0	1,600	91	87	86	83	86	86	84	88
	1500	983.0	1.318	90	86	85	82	85	85	83	87
	1400	799.2	1,072	90	85	84	81	84	85	83	87
	1300	639.9	858	89	86	83	79	84	85	81	85
	1200	503.3	675	89	85	82	78	83	84	81	84
	1100	387.7	520	88	84	82	77	82	83	80	83
	1000	291.3	391	87	84	81	77	82	83	80	83
	9001600	215,193.0	285600	g7 85	83 81	80 ⁸⁰	76 ⁷⁷	81 ⁸⁰	82 ⁸⁰	79 78	82 ⁸²
	800 ¹⁵⁰⁰	149 ^{983.0}	20h318	86 85	83 80	₈₀ 79	76 ⁷⁶	81 ⁷⁹	81 ⁸⁰	78 78	82 ⁸¹
	7001400	₉₉ 799.2	134072	85 ⁸⁴	82 ⁸⁰	₇₉ 79	75 76	₈₀ 79	81 79	78 77	81 ⁸¹
	1300	639.9	858	83	80	77	73	78	79	76	79
	1200	503.3	675	83	79	77	72	77	78	75	78
			⁵²⁰ Pressure	ta (OBĞ́́́F)	⁷⁹ ≁Qista	76 anc q :5	15 Mjęte	rs (₇ 49	.2 Fe;e;t)	74 74	78 77
		ENGINE 212.3	ENGINE 285	OVERALL	125 ⁷⁷ 77	250 ⁷⁵	500 70	1000 ⁷⁵	2000 76	4000 ⁷³ HZ 72 72	8000 ⁷⁶
	SPEE ⁸⁰⁰		POWER 200		HZ_{76}^{77}	HZ 73	нz ₆₉	HZ 75	2000 HZ 76 75	HZ_{-2}^{72}	/0
	RPM	BKW	BHP 134	80 DB(A)	DB 76	DB ⁷³	DB 69	п 2 74 DB	DB 75	DB ⁷²	н 2 75 DB
	1600	1,193.0	1,600	85	81	80	77	80	80	78	82
	1500	983.0	1.318	85 85	80	80 79	76	79	80 80	78 78	82 81
	1400	799.2	1,072	84	80	79 79	76	79	79	77	81
	1300	639.9	858	83	80	77	73	78	79	76	79
	1200	503.3	675	83	79	77	72	77	78	75	78
	1100	387.7	520	82	79	76	72	77	78	74	78
	1000	291.3	391	82	78	75	71	76	77	74	77
	900	212.3	285	81	77	75	70	75	76	73	76
	800	149.1	200	80	77	74	70	75	76	72	76
	700	99.9	134	80	76	73	69	74	75	72	75

	Perform	ance Number	: DM8712	Cha	inge Level:	01					
Sales Model:	351122000	1,118.5	1,500	113	118	Rátêd	Speé@6(R	(PM)1051.	200 108	106	104
Application:		SODAT ଅନ୍ୟୁକ୍ତ କାର୍ଯ୍ୟ	1,155	111	116		Power3(B			104	102
Rating Level:				109 108	113 112		lPowee⊉(B			98 97	94
Rating Level.	800	331.4	444	108	112	104	100	99	102	97 95	92 90
	700	222.0	298	104	108	102	98	97	100	93	89
		UST Sound F		ı(OBC₀E)		ance ₀₁	1.5 Mgeter	-	-	92	87
I	450	59.0	ENGINE ¹⁰⁹ 79 POWER	OVERALL	125 ¹⁰⁶ 105 HZ	250 ₉₉ нz	500 ⁹⁶ НZ	1000 ₉₄ нz	2000 ₉₇ НZ	4000 91 НZ	8000 ⁸⁶ HZ
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1200	1.118.5	1.500	113	118	113	106	105	108	106	104
	1100 1000	861.5 647.3	1,155 868	111 109	116 113	111 107	104 103	103 102	106 105	104 98	102 94
	900	471.9	633	109	113	107	103	102	105	98 97	94 92
	800	331.4	444	106	112	100	102	99	104	95	90
	700	222.0	202	104	100	100	98	97	100	93	89
	600 ¹²⁰⁰	139.818.5	290 187500	103 100	108 107 ¹⁰⁶	102 101	97 94 96 92	96 94 96 92	99 94 99 92	92 94 91 92	87 89 86 87
	500 ¹ 100 450 ¹ 000	80.861.5 59.647.3	187,000 109,155 79,868	103 98 102 98 101 96	107 ¹⁰⁰ 106 ¹⁰⁴ 105 ¹⁰⁴	101 99 100 99 00 95	90	90	90 00	91 05	00
	450,000	59.011.0	633	101 00 94	105 101	99 95 93	95 92 90	94 90 89	97 90 88	90 85 83	86 81 79
	800	331.4	444	93	101	92	89	87	87	82	77
		222.0	298	91 (OPCE)	99 Diet	90	87	85	85 N	80	76
		UST Sound F		, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		ance;9	7 Meeter		0 Feget)	79 77	74
I	- 450	59.0	ENGINE ¹⁰⁹ 79 POWER	OVER	125 ⁹⁶ НZ	250 ⁸⁷ HZ	500 ⁸⁴ HZ	1000 ⁸³ НZ	2000 ⁸² HZ	4000 ₇₇ HZ	8000 ⁷³ HZ
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1200	1.118.5	1.500	100	106	101	94	94	94	94	89
	1100	861.5	1.155	98	104	99	92	92	92	92	87
	1000 900	647.3 471.9	868 633	96 94	104 102	95 93	92 90	90 89	90 88	85 83	81 79
	800	331.4	444	93	102	93 92	90 89	87	87	82	75
	700	222.0	000	91	99	90	87	85	85	80	76
	600 ¹²⁰⁰	139.818.5	298 187500	90 93	98 ¹⁰⁰	89 ⁹⁴	86 87	84 87 84 05	84 88	79 87	74 82
	500 ¹ 100 450 ¹ 000	80.861.5 50.647.3	109155 79 ⁸⁶⁸	88 91 88 89	96 98 96 97	87 92 87 88	84 85 84 85	83 85 82 84	82 86 82 83	77 85 77 78	73 80 73 74
	450 900	59.0 ^{47.3} 471.9	79 ⁶⁰⁰ 633	88 89 88	96 97 96	87 ⁰⁰ 87	84 ⁶⁵ 84	82 ⁸⁴ 82	82 83 82	77 ⁷ 8 77	73 74 72
	800	331.4	444	86	94	85	82	80	80	75	71
	700	222.0	298	84 (OPCE)	92	83	80	79	78	73	69
		UST Sound F				ance <u>s</u> 2	15 Meter	-	2 Ferent)	72 71	68 67
I	450	59.0	POWER	OVER	125 ⁹⁰ НZ	250 ⁸¹ НZ	500 ⁷⁸ НZ	1000 <mark>7</mark> 6 НZ	2000 ⁷⁶ НZ	4000 71 НZ	8000 ⁶⁷ HZ
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1200	1,118.5	1.500	93	100	94	87	87	88	87	82
	1100	861.5	1.155	91	98	92	85	85	86	85 79	80
	1000 900	647.3 471.9	868 633	89 88	97 96	88 87	85 84	84 82	83 82	78 77	74 72
	800	331.4	444	86	90 94	87 85	82	82 80	82 80	75	72
	700	222.0	298	84	92	83	80	79	78	73	69
	600	139.8	187	83	91	82	79	77	77	72	68
	000	155.0	107		91	02				12	
	500 450	80.9 59.0	109 79	82 81	90 89	81 80	78 77	76 76	76 75	71 70	67 66

	Performan	ce Number: [DM8712	Change L	.evel: 01				
Sales Model: 3	51200	1,118.5	1.500	101	97 Ra%	ed Speed (RF	DM)95 1 20	0 96	93 96
Application: N			1,155						92 95
	1999					d Power (BK	94 1,11	95	91 95
Rating Level: C						əd Poweer (Bl		00 ₉₄	91 94
	800	331.4	444		95 92	88	92	93	90 94
		L Spynd Pres	298 Suro Data (O	BCE)	⁹⁴ ₉ Distance	1 Meters	s (⁹² ₉₁ 3.3	Feget)	90 93
		00.0							89 92
SF	PEED PO	GINE ^{80.9} ENG WER ^{59.0} POW	70	ERALL 128 96 HZ	5 ⁹³ 250 ⁹⁰ 2 ⁹² HZ ⁹⁰	500 ⁸⁶ НZ ⁸⁵	1000 ⁹¹ 2 HZ ⁹⁰ 1	000 ⁹¹ 400 HZ ⁹¹ HZ	о ⁸⁸ 8000 ⁹² 2 ⁸⁸ нz ⁹¹
F	RPM B	KW B	HP DI	B(A) DB		DB	DB I	DB DE	B DB
			1.500 10			90		96 93	96
	100	861.5	1.155 10			89		95 92	95
	000	647.3	868 99			89	• •	95 91	95
	900 300	471.9 331.4	633 99 444 90			88 88		94 91 93 90	94 94
	700	222.0	298 9			87		93 90 93 90	94 93
	500 ²⁰⁰	139188.5	1 /17/500 g	7 89 93	85 90 82	86 78	91 83 c	az 84 – 89	81 gg 84
Į	500 ¹⁰⁰	80861.5	10 ¹ 9155 9	₆ 88 93	84 ₉₀ 82	86 77	91 82 c	91 ⁸³ 88	80 ₉₂ 83
4	450 ⁰⁰⁰	596 6 17.3	79868 9	6 87 92	84 90 81	85 77	90 ⁸² g	91 ⁸³ 88	80 9 <u>1</u> 83
	900	471.9	633		83 80	76	81	82	79 82
	800	331.4	444		83 80	76	81	81	78 82 78 81
	MEGHANICA		ssure ²⁹⁸ #Pata (O		⁸² ⁸ Pistanc ç ₉	7 Meters		Feet)	77 80
EN SF	GINE ⁰⁰ ENG PEED PO	GINE ^{80.9} ENG WER ^{59.0} POW		ERALL 125 84 HZ	5 ⁸¹ 250 ⁷⁸ 2 ⁸⁰ HZ ⁷⁸	500 ⁷⁴ нz ⁷³	1000 ⁷⁹ 2 HZ ⁷⁸ 1	000 ⁸⁰ 400 Hz ⁷⁹ Hz	и ⁷⁶ 8000 ⁸⁰ 2 ⁷⁶ н2 ⁷⁹
		KW B	HP DI	B(A) DB		DB			
					5 00	DB	DB I	DB DE	B DB
			1.500 8	9 85	82	78	83 8	34 81	84
1	100	861.5	1.155 8	9 85 8 84	82 82	78 77	83 8 82 8	34 81 33 80	84 83
1 1	100 000	861.5 647.3	1,155 8 868 8	9 85 8 84 7 84	82 82 81	78 77 77	83 8 82 8 82 8	34 81 33 80 33 80	84 83 83
1 1 5	100 000 900	861.5 647.3 471.9	1,155 8 868 8 633 8	9 85 8 84 7 84 7 83	82 82 81 80	78 77 77 76	83 8 82 8 82 8 82 8 81 8	34 81 33 80 33 80 32 79	84 83 83 82
1 1 5 8	100 000 900 800	861.5 647.3 471.9 331.4	1.155 8 868 8 633 8 444 8	9 85 8 84 7 84 7 83 6 83	82 82 81 80 80	78 77 77 76 76	83 8 82 8 82 8 81 8 81 8	34 81 33 80 33 80 32 79 31 78	84 83 83 82 82
1 1 5 7	100 000 900 800 700	861.5 647.3 471.9 331.4 222.0	1.155 8 868 8 633 8 444 8 298 8	9 85 8 84 7 84 7 83 6 83 5 82	82 82 81 80 80 79	78 77 77 76 76 76 75	83 8 82 8 82 8 81 8 81 8 80 8	34 81 33 80 33 80 32 79 31 78 31 78	84 83 83 82 82 81
1 1 5 8 7 7	100 000 900 800 700 500 200	861.5 647.3 471.9 331.4 222.0 139!88.5	1,155 8, 868 8 633 8 444 8 298 8 147500 8	9 85 8 84 7 84 7 83 6 83 5 82 5 83 81	82 82 81 80 80 79 79 79 79	78 77 76 76 76 75 74 72	83 8 82 8 82 8 81 8 80 8 79 77	34 81 33 80 33 80 32 79 31 78 30 78 30 78 30 78 30 78	84 83 82 82 81 75 80 78 74 80 78
1 1 5 7 7 8	100 000 900 300 700 500 ⁴ 200 500 ⁴ 100	861.5 647.3 471.9 331.4 222.0	1.155 8: 868 8: 633 8: 444 8: 298 8: 187 ⁵⁰⁰ 8: 109155 8:	9 85 8 84 7 84 7 83 6 83 5 82 5 83 4 82	82 82 81 80 80 79 79 79 79 78 76 78 76	78 77 76 76 76 75 74 72 74 72 74 72	83 8 82 8 82 8 81 8 80 8 79 77	34 81 33 80 33 80 32 79 31 78 30 78 30 78 30 78 30 78	84 83 82 82 81 75 80 78 74 80 78
1 1 5 7 7 8	100 000 300 500 500 500 500 400 500 400 900	861.5 647.3 471.9 331.4 222.0 139188.5 80%91.5 59%77.3 471.9	1.155 8: 868 8: 633 8: 444 8: 298 8: 1⋬7500 8: 1⋬9155 8: 79868 8: 633	9 85 8 84 7 84 7 83 6 83 5 82 5 83 4 82 81 81	82 82 81 80 79 79 79 79 79 78 76 78 78 78 75	78 77 76 76 75 74 72 74 72 74 72 73 71 70	83 8 82 8 82 8 81 8 80 8 79 77 78 76 75 7	34 81 33 80 33 80 34 79 31 78 30 78 77 30 78 76	84 83 82 82 75 80 78 74 80 78 74 79 77 73 76
1 1 5 7 7	100 000 300 500 500 500 500 500 450 900 800	861.5 647.3 471.9 331.4 222.0 139188.5 80%91.5 50%77.3 471.9 331.4	1.155 8 868 8 633 8 444 8 298 8 1₫7 ⁵ 00 8 1₫9 ¹⁵⁵ 8 79 ⁸ 68 8 633 444	9 85 8 84 7 84 7 83 6 83 5 82 5 81 4 82 81 4 82 80	82 82 81 80 79 79 79 79 79 78 76 78 77 75 77 74	78 77 76 76 75 74 72 74 72 73 71 70 70	83 8 82 8 81 8 81 8 80 8 79 77 8 78 76 7 75 75	34 81 33 80 33 80 32 79 31 78 31 78 30 78 30 78 30 78 30 78 30 78 79 77 70 76	84 83 82 82 75 80 78 74 80 78 74 79 77 73 76 72 76
1 1 5 6 6 7 7	100 000 300 500 500 500 500 450 900 800 MEGHANICA	861.5 647.3 471.9 331.4 222.0 139188.5 80%91.5 59%97.3 471.9 331.4 222.0 L Spygd Pres	1.155 8 868 8 633 8 444 8 298 8 187 ⁵⁰⁰ 8 109155 8 79 ⁸⁶⁸ 8 633 444 298 5sure Pata (O	9 85 8 84 7 84 7 83 6 83 5 83 81 4 82 81 4 82 80 81 80 80 80 80 80 80 80 80 80 80	82 82 81 80 79 79 79 79 78 76 77 75 77 75 77 75 77 75 77 75 77 75 77 75	78 77 76 76 75 74 72 74 72 73 71 70 70 70 15 Meters	83 8 82 8 81 8 81 8 79 77 8 79 77 8 79 77 8 75 75 75 75 75 75 75 75	34 81 33 80 32 79 31 78 30 78 30 78 70 76 75 76 75 75 Fçeşt) 1	84 83 82 82 81 75 80 74 80 74 70 73 76 72 76 72 75 71 75
1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	100 000 000 000 000 000 000 000	861.5 647.3 471.9 331.4 222.0 139188.5 80%91.5 50%77.3 471.9 331.4	1.155 86 868 8 633 8 444 86 298 8 187500 8 187500 8 187500 8 187500 8 633 444 298 633 444 298 5sure Pata (O INE 109 OVE	9 85 8 84 7 84 7 83 6 83 5 83 81 4 82 81 4 82 80 80 80 80 80 80 80 80 80 80	82 82 81 80 79 79 79 79 79 78 76 78 77 75 77 74	78 77 76 76 75 74 72 74 72 73 71 70 70 70 15 Netters	83 8 82 8 81 8 80 8 79 77 8 78 76 7 75 75 74 74 74 74 74 9.2	34 81 33 80 33 80 32 79 31 78 30 78 30 78 70 76 76 76 76 76 75 76 75 76 75 76 75 76 75 76	84 83 82 82 81 75 80 74 80 74 70 73 76 72 76 72 75 71
1 1 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	100 000 000 000 000 000 000 000	861.5 647.3 471.9 331.4 222.0 139188.5 80%91.5 50%97.3 471.9 331.4 222.0 139188.5 80%91.5 50%97.3 471.9 331.4 222.0 331.4 222.0 331.4 222.0 331.4 222.0 331.4 222.0 331.4 222.0 331.4 222.0 331.4 222.0 59.0 ENG WER POW	1.155 86 868 8 633 8 444 86 298 8 187500 8 187500 8 187500 8 109155 8 79868 8 633 444 298 ssure Pata (O INE 109 OVE 79 VER	9 85 8 84 7 84 7 83 6 83 5 83 81 4 82 81 4 82 80 80 80 80 80 80 80 80 80 80	82 82 81 80 79 79 79 79 79 79 79 79 78 76 77 74 76 77 74 76 75 75 250 72 25 75 42 75 42 75 77 77 75	78 77 76 76 75 74 72 74 72 73 71 70 70 69 15 Meters 506 ⁶⁸	83 € 82 € 81 € 80 € 79 77 € 79 77 € 75 75 75 75 75 74 74 73 1000 ³ 2 HZ ⁷³	34 81 33 80 32 79 31 78 30 78 30 78 76 76 76 76 75 76 76 76 75 76 75 76 76 76 75 76 76 76 75 76 76 76 75 76 76 76 75 76	84 83 82 82 75 80 78 74 79 77 73 76 72 75 71 75 71 75 71 75 71 75 70 HZ
1 1 9 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	100 000 300 300 500 500 500 500 5	861.5 647.3 471.9 331.4 222.0 13918 8.5 80% 1.5 59% 7.3 471.9 331.4 222.0 13918 8.5 80% 1.5 59% 7.3 471.9 331.4 222.0 Comparison of the second sec	1.155 8 868 8 633 8 444 8 298 8 1d7500 8 1d7500 8 1d750 8 79868 8 633 4 444 298 Sure Pata (O INE 109 OVE 79 HP DI 1.500 8	9 85 8 84 7 83 6 83 5 82 5 83 4 82 80 80 81 125 82 12 83 12<	82 82 81 80 79 79 79 77 79 78 76 78 78 75 77 75 77 75 77 74 76 575 25072 275 HZ ⁷² 3 DB	78 77 76 76 75 74 72 74 72 73 71 70 70 15 Meters 500 ⁶⁸ HZ ⁶⁸ DB	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	34 81 33 80 33 80 32 79 31 78 30 78 76 76 75 76 75 76 75 76 75 76 75 76 75 76 75 76 75 76 75 76 75 76 75 76 75 76 75 76 75 76 75 76 76 75 00074 400 HZ HZ DB DE 78 75	84 83 83 82 82 82 81 75 80 78 74 80 78 74 79 77 73 76 72 76 72 75 71 75 71 75 71 75 71 800₹4 70 HZ ⁷⁴ 3 DB
1 1 5 6 6 5 7 7 7 7 7 7 7 7 1 1	100 000 300 300 300 300 300 300	861.5 647.3 471.9 331.4 222.0 13918.5 80%51.5 59%77.3 471.9 331.4 222.0 L Soying Pres Sine ^{80.9} WER ^{80.9} POW KW E 1.118.5 861.5	1.155 8 868 8 633 8 444 8 298 8 109155 8 79868 8 633 4 444 298 8 8 444 298 8 0 0 0 0 0 0 0 0 0 0 0 0 0	9 85 8 84 7 83 6 83 5 82 5 83 4 82 80 80 BCF 128 80 HZ 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 81 128 82 128 83 79 2 79	82 82 81 80 79 79 79 79 78 76 77 78 78 78 78 78 78 78 77 75 77 74 76 575 250 72 75 42 75 42 75 42 75 42 75 42 75 77 77 77 73 78 78 78 78 78 78 78 78 78 78 78 78 78	78 77 76 76 75 74 72 73 71 70 70 15 Meters 500 ⁶⁸ HZ ⁶⁸ DB 72 72	83 8 82 8 81 8 81 8 79 77 8 79 77 8 75 75 74 76 7 75 75 74 9.2 1000 ⁷³ 2 HZ ⁷³ 1 DB 1 77 7 77 7	33 80 33 80 32 79 31 78 30 78 78 77 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 77 76 76 76 76 76 76 76 76 76 76 76 77 76 78 74 DB DE 78 74	84 83 83 82 82 82 75 80 78 74 79 77 73 76 72 76 72 76 75 71 75 71 75 76 80074 4 20 HZ 74 80074 14 3 DB 78 78 78
1 1 5 6 6 5 7 7 7 7 7 7 7 7 1 1 1 1	100 000 300 300 300 300 300 300	861.5 647.3 471.9 331.4 222.0 13918.5 80% 1.5 59% 7.3 471.9 331.4 222.0 L Soying Pres SINE ^{80.9} WER ^{80.9} WER ^{80.9} WER ^{80.9} WER ^{80.9} MER ^{90.9} KW E	1.155 8: 868 8: 633 8: 444 8: 298 8: 1d9155 8: 79868 8: 633 444 298 sure Pata (O NE 109 OVE 79 HP DI 1.500 8: 1.155 8: 868 8:	9 85 8 84 7 83 6 83 5 82 5 83 4 82 81 80 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 81 83 82 81 83 78 84 79 2 78	82 82 81 80 79 79 79 79 78 76 77 78 78 78 75 77 75 77 75 250 72 75 250 72 75 42 75 77 77 76 75 77 77 75 77 75 75 77 75 75 77 75 75	78 77 76 76 75 74 72 74 72 73 71 70 70 15 Meters 500 ⁶⁸ HZ 68 DB 72 72 71	83 8 82 8 81 8 81 8 80 7 79 77 8 77 75 7 75 7 74 7 75 7 74 7 74 9.2 1000 ⁷³ 2 HZ ⁷³ 7 77 7 76 7	33 80 33 80 32 79 31 78 30 78 76 76 77 74 00074 400 400 40 78 74 78 74	84 83 83 82 82 81 75 80 78 74 80 78 74 79 77 73 76 72 76 72 75 71 75 71 75 71 75 71 75 71 75 71 75 71 75 76 72 76 72 76 72 76 72 76 72 76 72 76 72 76 75 76 72 76 72 76 75 76 72 76 75 76 72 76 75 76 72 76 75 76 77 76 77 76 72 76 75 76 72 76 75 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 77
1 1 5 6 6 7 7 7 8 7 8 7 8 7 7 1 1 1 1	100 000 000 000 000 000 000 000	861.5 647.3 471.9 331.4 222.0 13918.5 80%1.5 50%7.3 471.9 331.4 222.0 L Spygd Pres Sine ^{80.9} WER ^{80.9} POW KW B 1.118.5 861.5 647.3 471.9	1.155 84 868 8 633 8 444 84 298 8 1₫7 ⁵⁰⁰ 8 1₫7 ⁵⁰⁰ 8 1₫7 ⁵⁰⁰ 8 1₫7 ⁵⁰⁰ 8 79 ⁸⁶⁸ 8 633 444 5 5 5 10 ⁹ 5 8 8 8 10 ⁹ 5 79 79 79 79 79 79 79 79 79 79 79 79 79	9 85 8 84 7 84 7 83 6 83 5 82 5 82 81 80 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 81 80 82 91 78 HZ 83 79 2 78 2 78 2 78 1 77	82 82 81 80 79 79 79 79 78 76 77 77 74 76 75 250 72 25 75 42 75 77 75 42 75 77 75 77 76 75 77 76 75 75 75 75	78 77 76 76 75 74 72 74 72 74 72 73 71 70 70 70 15 Nesters 500 ⁶⁸ HZ 68 HZ 68 DB 72 72 71 70	83 8 82 8 82 8 81 8 80 8 79 77 8 79 77 8 79 77 8 75 75 74 75 75 74 75 75 74 1000 ³ 2 HZ ⁷³ 1 DB 1 77 7 77 7 77 7 77 7 75 7 77 7 75 7 75 7 75 7 75 7 74 1000 ³ 2 77 7 77 7 77 7 77 7 77 7 77 7 77 7 77 7 75 7 75 7 74 77 7 77 7 75 7 77	33 80 33 80 32 79 34 78 30 78 30 78 76 76 75 76 75 76 76 76 75 76 76 76 76 75 76 75 76 75 78 74 76 73 78 74 76 73	84 83 83 82 82 81 75 80 78 74 80 78 74 79 77 73 76 72 75 71 75 71 75 71 75 71 75 71 75 71 75 71 75 71 75 71 75 76 72 75 71 75 76 72 75 77 76 72 75 77 76 72 75 77 76 72 75 77 76 72 75 77 76 72 75 77 76 72 75 77 76 72 75 77 76 72 75 77 76 72 75 77 76 72 75 77 76 75 77 76 77 75 76 77 75 76 72 75 77 76 75 77 76 77 75 76 77 75 76 77 75 77 76 72 75 77 76 72 75 77 76 72 75 77 76 72 75 77 76 77 75 77 76 77 75 77 76 77 75 77 76 77 75 77 76 77 75 77 76 72 75 77 76 77 75 77 76 77 75 77 76 77 75 77 76 77 75 77 76 77 76 77 75 77 76 77 76 77 77 76 77 77 76 77 77 76 77 77
1 1 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	100 000 300 700 500 100 450 000 900 800 MEGHANICA GINEO ENC PED PO RPM BI 200 100 000 300	861.5 647.3 471.9 331.4 222.0 139188.5 80%91.5 50%77.3 471.9 331.4 222.0 L Sound Pres Sine 80.9 WER 59.0 POW KW E 1.118.5 861.5 647.3 471.9 331.4	1.155 86 868 8 633 8 444 8 298 8 187 ⁵⁰⁰ 8 187 ⁵⁰⁰ 8 187 ⁵⁰⁰ 8 187 ⁵⁰⁰ 8 633 444 298 633 444 298 Sure D 1.55 8 Sure D 1.55 8 868 8 633 8 444 8	9 85 8 84 7 83 6 83 5 82 5 82 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 125 80 125 80 125 80 125 80 178 1 77 0 77	82 82 81 80 79 79 79 79 79 78 76 77 77 74 76 75 77 75 47 75 75 77 75 47 75 77 75 77 75 77 75 77 75 77 76 75 75 77 75 77 75 77 74	78 77 76 76 75 74 72 74 72 74 72 73 71 70 70 69 15 Nesters 500 ⁶⁸ HZ 68 HZ 72 72 72 71 70 70	83 8 82 8 81 8 80 8 79 77 75 74 75 74 100073 2 HZ 7 76 7 77 7 76 7 77 7 76 7 77 7 76 7 75 7 76 7 75 7 75 7 76 7 75 7 75 7 75 7 75 7	34 81 33 80 33 80 32 79 31 78 30 78 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 72 00074 400 HZ HZ DB DE DB DE 78 74 77 74 76 73 76 73 76 73 76 73 76 73 76 73 76 72	84 83 83 82 82 81 75 80 74 80 78 74 79 77 73 76 72 75 71 75 71 75 71 75 71 75 71 75 71 75 71 75 71 75 71 75 76 78 78 78 77 76 76 76 76 77 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 77 77 76 75 77 76 75 77 76 75 77 76 77 75 77 76 77 76 77 77 76 77 77 76 77 77 76 77 77
1 1 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	100 000 300 700 500 200 500 100 450 000 900 800 700 MEGHANICA GINEO PED PO RPM BI 200 100 000 300 700 200 200 200 200 200 200 2	861.5 647.3 471.9 331.4 222.0 139188.5 80%1.5 50%7.3 471.9 331.4 222.0 L Soyad Pres SINE ^{80.9} WER ^{80.9} FNG WER ^{80.9} POW KW B 1.118.5 861.5 647.3 471.9 331.4 222.0	1.155 8 868 8 633 8 444 8 298 8 1d9155 8 79868 8 633 444 298 8 633 444 298 8 633 444 298 8 MP 0 1.155 8 868 8 633 8 444 8 298 8	9 85 8 84 7 83 6 83 5 82 5 83 4 82 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 81 78 92 78 1 77 0 76	82 82 81 80 79 79 79 79 78 76 77 77 76 577 77 74 76 575 250 72 476 75 77 77 74 76 575 250 72 477 75 77 75 77 75 77 75 77 75 77 75 77 75 77 75 77 73	78 77 77 76 76 75 74 72 74 72 73 71 70 70 15 Mg ters 500 ⁶⁸ HZ 68 HZ 68 DB 72 72 72 71 70 69	83 8 82 8 82 8 81 8 80 8 79 77 76 7 75 74 700 7^3 2 H273 1000 7^3 DB 1000 7^7 75 7 76 7 77 7 76 7 77 7 76 7 77 7 76 7 75 7 76 7 77 7 76 7 75 7 75 7 76 7 75 7 75 7 74 7	34 81 33 80 33 80 32 79 31 78 30 78 76 76 75 76 75 76 76 75 78 74 76 75 78 75 78 75 78 75 78 75 76 73 77 74 76 72 76 72 75 72	$\begin{array}{c} 84\\ 83\\ 83\\ 82\\ 82\\ 82\\ 82\\ 81\\ 75\\ 80\\ 74\\ 80\\ 78\\ 74\\ 79\\ 77\\ 73\\ 76\\ 72\\ 76\\ 72\\ 76\\ 72\\ 76\\ 72\\ 76\\ 76\\ 78\\ 78\\ 78\\ 78\\ 76\\ 76\\ 76\\ 75\\ \end{array}$
1 1 9 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	100 000 300 700 500 100 450 000 900 800 MEGHANICA GINEO ENC PED PO RPM BI 200 100 000 300	861.5 647.3 471.9 331.4 222.0 139188.5 80%91.5 50%77.3 471.9 331.4 222.0 L Sound Pres Sine 80.9 WER 59.0 POW KW E 1.118.5 861.5 647.3 471.9 331.4	1.155 86 868 8 633 8 444 8 298 8 187 ⁵⁰⁰ 8 187 ⁵⁰⁰ 8 187 ⁵⁰⁰ 8 187 ⁵⁰⁰ 8 633 444 298 633 444 298 Sure D 1.55 8 Sure D 1.55 8 868 8 633 8 444 8	9 85 8 84 7 83 6 83 5 82 5 83 4 82 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 80 81 79 2 78 1 77 0 76 9 76	82 82 81 80 79 79 79 79 79 79 79 79 79 79 79 79 79	78 77 76 76 75 74 72 74 72 74 72 73 71 70 70 69 15 Nesters 500 ⁶⁸ HZ 68 HZ 72 72 72 71 70 70	83 8 82 8 82 8 81 8 80 79 77 8 79 77 76 7 74 73 100 $\sqrt{3}$ 2 HZ 1 77 7 75 7 76 7 77 7 76 7 77 7 75 7 76 7 75 7 75 7 75 7 75 7 75 7 75 7 75 7 75 7 73 7	34 81 33 80 33 80 32 79 31 78 30 78 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 76 72 00074 400 HZ HZ DB DE DB DE 78 74 77 74 76 73 76 73 76 73 76 73 76 73 76 73 76 72	84 83 83 82 82 81 75 80 74 80 78 74 79 77 73 76 72 75 71 75 71 75 71 75 71 75 71 75 71 75 71 75 71 75 71 75 76 78 78 78 77 76 76 76 76 77 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 76 75 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 77 77 76 75 77 76 75 77 76 75 77 76 77 75 77 76 77 76 77 77 76 77 77 76 77 77 76 77 77

Data Date: 3/29/2011

	mance Numbe	er: DM8713	Ch	ange Level:	01					
Sales Model: 35112200	1,044.0	1,400	113	118	Rátêd	Speé@6(RPM) ¹⁰⁴ 1,	200 107	106	104
Application: MARINE F	ROPUL SIGN	1,078	111	116	Rated	Power (BKW) ¹⁰² 1,	044 105	104	102
Rating Level: B-R		×) 810	109	113	Dated		BHP)1001,	400400	98 96	93
800	309.3	Y) 591 415	107 106	111 110	104	100 1 00	99	102	96 95	92 90
700	207.2	278	100	108	102	98	97	102	93	89
60 ÆXH	AUST Second	Pressure Da	ta (OBQE)		ance ₀₁	1.5 Met	ers (964.9) Feget)	92	87
$\operatorname{Engin}_{F_{50}}^{500}$	ENGINE 75.5	ENGINE 101	OVERALL	125 106	250 99	500 96 95	1000_{94}^{95}	2000 ₉₇	4000 91	8000 ₈₅
SPEED	POWER	POWER		HZ	HZ	HZ	HZ	HZ	HZ	HZ
RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
1200	1.044.0	1.400	113	118	113	106	104	107	106	104 102
1100 1000	804.1 604.2	1,078 810	111 109	116 113	111 107	104 103	102 102	105 105	104 98	93
900	440.4	591	103	111	107	103	102	103	96 96	93 92
800	309.3	415	107	110	103	100	99	102	95	90
	207,2 13h044.0	070	104	400		98	97	100	93	89
700 600 ¹ 200		⊿-jL400	103 99	$108 \\ 107 \\ 107 \\ 104 \\ 104$	102 101 100 98	97 93 97 01	96 93	99 94	92 93	87 88
	75.5 55604.2	175 101 74810	102 97 101 96	106 07		96 91 95 92	95 91 95 90	98 92 97 90	91 91 91 85	86 86 85 80
450 ¹ 000 900	55.004.2 440.4	74 ⁶¹⁰ 591	101 96 94	105 ¹⁰⁴ 105 ¹⁰²	100 95 99 95 93	95 92 90	94 90 88	97 90 88	90 83	85 ⁸⁰ 79
800	309.3	415	92	100	91	88	87	86	81	77
700	207.2	278	91	99	90	87	85	85	80	76
	AUST Sound		ta (OBG₽)		ances:8	7 Maete		0 Feget)	78	74
ENGINE SPEED	ENGINE 55.1 POWER	ENGINE 74 POWER	OVERALL	125 ⁹⁶ HZ	250 ⁸⁷ НZ	500 ⁸⁴ HZ	1000 ₈₂ нz	2000 ₈₂ нz	4000 ₇₇ HZ	8000 ₇₂ HZ
RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
1200	1.044.0	1.400	99	106	100	93	93	94	93	88
1100	804.1	1,078	97	104	98	91	91	92	91	86
1000	604.2	810	96	104	95	92	90	90	85	80
900	440.4	591	94	104 102	93	90	88	88	83	79
900 800	440.4 309.3	591 415	94 92 91	104 102 100	93 91 90	90 88 87	88 87 85	88 86 85	83 81 80	79 77 76
900 800 700 cod1200	440.4 309.3 207.2 130.5	591 415 278 4-5400	94 92 91 89 93	104 102 100 99 97 99	93 91 90 88 94	90 88 87 85 87	88 87 85 84 86	88 86 85 83 87	83 81 80 78 87	79 77 76 74 82
900 800 700 600 ¹ 200 600 ¹ 100	440.4 309.3 207.2 13b(544.0 75.5 204.1	591 415 278 175 ⁴⁰⁰ 10 ¹ 078	94 92 91 89 93 88 91	104 102 100 99 97 99 96 97	93 91 90 88 94 87 92	90 88 87 85 87 85 85	88 87 85 84 83 84	88 86 85 83 87 82	83 81 80 78 87 77 85	79 77 76 74 82 73 ⁸⁰
900 800 700 600 200 500 100 450	440.4 309.3 207.2 130.5 75804.1 55604.2	591 415 278 175 400 175 078 74 ⁸¹⁰	94 92 91 89 93 88 91 88 89	104 102 100 99 97 99 96 97 96 97	93 91 90 88 94 87 92 87 88	90 88 87 85 87 84 85 84 85	88 87 85 84 86 83 84 83 83	88 86 85 83 87 82 85 82 83	83 81 78 87 77 85 77 78	79 77 76 74 82 73 80 72 74
900 800 700,200 600,100 500,100 450,000 900	440.4 309.3 207.2 130.044.0 75804.1 55604.2 440.4	591 415 278 175 ⁴⁰⁰ 17 ⁵ 400 17 ⁶ 078 10 ⁴ 078 74 ⁸¹⁰ 591	94 92 91 93 89 91 88 89 88 89 87	104 102 100 99 97 99 97 97 96 97 96 97 95	93 91 90 88 94 87 92 87 88 87 88 86	90 88 87 85 85 85 84 85 84 83	88 87 85 84 83 84 83 83 82 83	88 86 85 83 87 82 85 82 83 82 83	83 81 78 87 77 85 77 78 77 78 76	79 77 76 74 82 73 80 73 74 72 72
900 800 700,200 600,200 500,100 450,000	440.4 309.3 207.2 130544.0 75804.1 55604.2 5440.4 309.3	591 415 278 175400 175078 101078 74810 74810 591 415	94 92 91 89 93 88 91 88 89	104 102 100 99 97 99 97 97 97 97 97 95 95 94	93 91 90 88 94 87 92 87 88	90 88 87 85 87 84 85 84 85	88 87 85 84 83 83 82 80 79	88 86 85 83 82 85 82 83 82 83 81 80 78	83 81 80 78 87 77 85 77 78 76 75	79 77 76 74 82 73 80 73 74 72 72 71
900 800 700 6001200 5001100 4501000 4501000 800 700	440.4 309.3 207.2 130.044.0 75804.1 55604.2 440.4	591 415 278 175400 104078 104078 104078 104078 591 415 278	94 92 91 93 89 91 88 89 88 89 87 86 84	104 102 100 99 99 96 97 96 97 95 94 92	93 91 90 88 92 87 88 87 88 86 85 83 ance2	90 88 87 85 84 85 84 85 83 82	88 87 85 84 83 83 82 80 79	88 86 85 83 87 82 85 82 83 81 80	83 81 78 87 77 85 77 78 77 78 76	79 77 76 74 82 73 80 73 74 72 72
900 800 700 6001200 5001100 450 900 800 700 60 (EXH	440.4 309.3 207.2 130.944.0 75604.2 55604.2 55604.2 55404.4 309.3 207.2 207.2 207.2 207.2 207.2 50000 207.2 207.5	591 415 278 175 400 175 078 101 74 810 74 810 74 811 415 278 Pressure Ba Encine 101	94 92 91 93 89 91 88 89 88 89 87 86 87 86 84 ta (OBGF)	104 102 100 99 99 96 97 96 97 95 94 92 94 92	93 91 90 88 92 87 88 87 88 86 85 83 ance2	90 88 87 85 84 85 84 85 84 83 82 80 15 Met	88 87 85 84 83 82 83 82 80 79 90 (7 49.	88 86 85 82 82 83 82 83 81 80 78 2 Feet)	83 81 80 78 85 77 78 76 75 73 72	79 77 76 82 74 80 73 74 72 72 71 69 68
900 800 700 500 100 450 900 800 700 60 (EXH ENGIN 500 SPEED	440.4 309.3 207.2 130.944.0 75.804.1 55.604.2 55.604.2 440.4 309.3 207.2 AUST Sound FORME 75.5 55.1 POWER	591 415 278 173 101 74 810 74 810 74 810 74 810 591 415 278 Pressure Dat ENGINE 74 POWER	94 92 91 93 89 91 88 89 88 89 87 86 84	104 102 100 99 97 96 97 95 94 92 92 92 92 92 92 92 91 95 125 89 HZ	93 91 90 88 92 87 87 88 86 85 85 83 ances2 250 81 HZ	90 88 87 85 84 85 84 85 83 82 80 15 Mete 500 ⁷ 8 HZ	88 87 85 84 83 82 83 82 80 79 ers (7 49 . 1000 75 HZ	88 86 85 83 82 85 82 83 82 83 81 80 78	83 81 80 87 85 77 85 77 78 76 75 73	79 77 76 82 73 80 73 74 72 71 69 68 66 8000 66 HZ
900 800 700 500 100 450 900 800 700 60 (EXH ENGIN 500 SPEED RPM	440.4 309.3 207.2 130.944.0 75.804.1 55.604.2 440.4 309.3 207.2 AUST Sound FORME FORME 55.1 POWER BKW	591 415 278 173 078 101 74 810 74 810 74 591 415 278 Pressure Dat ENGINE 74 POWER BHP	94 92 91 93 89 91 88 89 88 89 88 87 86 ta (OBGF) over81 L DB(A)	104 102 100 99 99 96 97 96 97 95 94 92 90 125 89 HZ DB	93 91 90 88 92 87 88 87 88 87 88 85 83 87 80 81 250 80 HZ DB	90 88 87 85 84 85 84 85 84 85 80 15 Meto 77 HZ DB	88 87 85 84 83 82 83 82 80 79 9 9 9 9 9 9 9 1000 75 HZ DB	88 86 85 82 82 83 82 83 81 80 78 2 Feet) 200075 HZ DB	83 81 80 78 85 77 78 76 75 73 72 71 400070 HZ DB	79 77 76 82 73 80 73 74 72 71 69 68 68 8000 66 HZ DB
900 800 700 600 1200 600 100 450 900 800 700 60 EXH ENGIN 500 SPEED RPM 1200	440.4 309.3 207.2 13b 44.0 75.5 440.4 309.3 207.2 440.4 309.3 207.2 AUST Sound ENGINE 75.5 55.1 POWER BKW 1.044.0	591 415 278 175400 175400 74810 591 415 278 Pressure 129 ENGINE 101 POWER 101 POWER BHP 1.400	94 92 91 93 89 91 88 89 87 86 86 84 ta (OBGF) OVERSTL DB(A) 93	104 102 100 99 97 96 97 96 97 95 94 92 90 125 89 HZ 90 125 89 HZ	93 91 90 88 92 87 87 88 86 85 83 anCe 2 250 81 HZ DB	90 88 87 85 84 85 84 85 83 82 80 15 Met 78 500 78 500 77 HZ DB	88 87 85 84 83 82 80 79 ers (7 49 . 100076 100075 HZ DB 86	88 86 85 82 82 83 82 83 81 80 78 2 76 76 2000 75 HZ 87	83 81 80 78 85 77 78 75 73 72 71 4000 70 HZ DB 87	79 77 76 74 82 73 80 73 74 72 72 71 69 68 68 66 800 66 HZ DB
900 800 700 600 ¹ 200 600 ¹ 200 500 100 450 900 800 700 60 EXH 500 ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 1100 450 900 800 700 900 800 700 900 800 8	440.4 309.3 207.2 130.44.0 75.5 440.4 309.3 207.2 44.0 309.3 207.2 2	591 415 278 175400 175400 101078 10178 410 591 415 278 Pressure Dat ENGINE 101 POWER BHP 1.400 1.078	94 92 91 93 89 91 88 89 86 86 86 86 84 ta (OBGF) OVER87 L DB(A) 93 91	104 102 100 99 97 97 96 97 95 94 92 92 94 92 92 91 125 89 HZ BB	93 91 90 88 92 87 88 85 83 ance2 250 81 HZ DB 94 92	90 88 87 85 84 85 84 85 82 80 15 Meta 500 77 HZ DB 87 85	88 87 85 84 83 82 80 79 ers (7 49. 79 100075 HZ DB 86 84	88 86 85 82 82 83 82 83 82 80 78 2 76 2000 75 HZ DB 87 85	83 81 80 77 85 77 78 77 76 75 73 72 71 4000 70 HZ DB 87 85	79 77 76 82 73 80 73 74 72 71 69 68 69 68 66 8000 66 HZ DB 82 80
900 800 700 600/200 600/200 500/100 450 900 800 700 60(EXH ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 1100 1000	440.4 309.3 207.2 130.944.0 75.604.2 55.404.2 55.404.2 207.2 207.2 207.2 207.2 207.2 207.2 207.2 207.2 55.0 207.2 55.0 207.2 55.0 207.2 55.0 207.2 55.0 207.2 55.1 207.2 55.1 804.1 55.1 804.1 604.2 207.	591 415 278 400 179 400 74 810 74 907 278 Pressure Dar 278 Pressure Dar 101 74 POWER BHP 1.400 1.078 810	94 92 91 93 89 91 88 89 88 87 86 84 ta (OBGF) OVER 87 L DB(A) 91 89	104 102 100 99 97 97 96 97 96 97 95 94 92 92 94 92 92 91 91 125 89 HZ 99 95 97 97	93 91 90 88 87 87 88 87 88 86 83 86 85 83 80 HZ 94 92 88	90 88 87 85 84 85 84 85 84 80 15 Meta 500 77 HZ DB 87 85 85 85 85 85 82 80 78 78 78 78 78 78 78 78 78 78	88 87 85 84 83 83 82 80 79 ers (7 49. 76 100075 HZ DB 86 84 83	88 86 85 82 82 83 82 83 82 80 78 2000 76 2000 76 HZ 76 BB 87 85 83	83 81 80 78 87 77 85 77 78 77 76 75 73 72 71 4000 70 HZ BB 87 85 78	79 77 76 82 74 80 73 74 72 71 69 68 66 8000 66 HZ DB 82 80 74
900 800 700 600 200 600 200 500 100 450 900 800 700 60 ENGIN 50 ENGIN 50 ENGIN 50 ENGIN 50 ENGIN 50 ENGIN 50 ENGIN 50 ENGIN 50 1200 60 200 800 700 800 800 700 60 800 700 800 800 700 60 EXH 50 800 800 800 800 800 800 800 800 800	440.4 309.3 207.2 130.944.0 75.5 440.4 309.3 207.2 440.4 309.3 207.2 207.2 207.2 207.2 207.2 55.0 44.0 309.3 207.2 55.0 44.0 309.3 207.2 55.0 44.0 309.3 207.2	591 415 278 175400 175400 101078 10178 410 591 415 278 Pressure Dat ENGINE 101 POWER BHP 1.400 1.078	94 92 91 93 89 91 88 89 86 86 86 86 84 ta (OBGF) OVER87 L DB(A) 93 91	104 102 100 99 97 97 96 97 95 94 92 92 94 92 92 91 125 89 HZ BB	93 91 90 88 92 87 88 85 83 ance2 250 81 HZ DB 94 92	90 88 87 85 84 85 84 85 82 80 15 Meta 500 77 HZ DB 87 85	88 87 85 84 83 82 80 79 ers (7 49. 79 100075 HZ DB 86 84	88 86 85 82 82 83 82 83 82 80 78 2 76 2000 75 HZ DB 87 85	83 81 80 77 85 77 78 77 76 75 73 72 71 4000 70 HZ DB 87 85	79 77 76 82 73 80 73 74 72 71 69 68 69 68 66 8000 66 HZ DB 82 80
900 800 700 600/200 600/200 500/100 450/900 800 700 60(EXH ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 1 00 100 100 1000	440.4 309.3 207.2 130.944.0 75.604.2 55.404.2 55.404.2 207.2 207.2 207.2 207.2 207.2 207.2 207.2 207.2 55.0 207.2 55.0 207.2 55.0 207.2 55.0 207.2 55.0 207.2 55.1 207.2 55.1 804.1 55.1 804.1 604.2 207.	591 415 278 175 400 175 400 74 591 415 278 Pressure 10 Power BHP 1.400 1.078 810 591	94 92 91 88 91 88 87 86 84 ta (OBGF) OVERSTL DB(A) 93 91 89 87	104 102 100 99 97 96 97 95 94 92 93 94 92 93 94 92 94 92 94 92 94 92 94 92 97 95	93 91 90 88 87 87 88 88 83 88 85 83 86 85 83 80 HZ 94 92 88 88 86	90 88 87 85 84 85 84 85 83 80 15 Meta 500 77 HZ DB 87 85 85 83 83 80 78 500 77 HZ 50 87 87 85 83 80 80 80 80 80 80 80 80 80 80	88 87 85 84 83 82 80 79 77 9 77 9 77 49. 76 1000 76 1000 75 HZ DB 86 84 83 82	88 86 85 82 82 82 83 82 83 82 83 81 80 78 2000 76 2000 76 2000 76 2000 75 HZ 75 BB 87 85 83 83 81	83 81 80 78 87 77 78 77 78 77 73 72 71 4000 70 HZ DB 87 85 77 85 77 85 73 72 73 72 73 72 73 73 72 73 73 72 73 73 72 73 73 72 73 73 72 73 73 72 73 73 72 73 73 73 72 73 73 73 75 73 75 73 76 75 73 72 73 72 73 72 73 72 73 72 73 76 75 75 75 75 75 75 75 75 75 75	79 77 76 82 74 80 73 74 72 71 69 68 8000 66 HZ DB 82 80 74 72
900 800 700 600 200 600 100 450 900 800 700 60 ENGIN 500 ENGIN 500 ENGIN 500 ENGIN 500 SPEED RPM 1200 1100 1000 900 800 800 800 800 800 800	440.4 309.3 207.2 130 944.0 75 604.2 55 604.2 440.4 309.3 207.2	591 415 278 175 400 175 400 74 810 74 591 415 278 Pressure 128 278 Pressure 128 74 POWER 8HP 1.400 1.078 810 591 415	94 92 91 88 91 88 87 86 84 ta (OBGF) OVERSTL DB(A) 93 91 89 87 86	104 102 100 99 97 97 97 96 97 95 94 92 92 94 92 92 94 92 94 92 94 92 97 95 99 97 95 94	93 91 90 88 87 87 88 88 86 85 83 ances 83 250 80 HZ 94 94 92 88 86 85	90 88 87 85 84 85 84 85 80 15 Meto 78 500 77 HZ DB 87 85 85 85 83 82 83 82	88 87 85 84 83 82 80 79 79 77 100075 HZ DB 86 84 83 82 80	88 86 85 82 82 83 82 83 82 83 81 80 78 2000 76 2000 76 2000 76 BB 87 85 83 81 80	83 81 80 78 87 78 87 78 77 78 77 78 77 73 72 71 4000 70 HZ DB 87 85 78 77 78 76 75 73 72 71 4000 70 HZ 75 76 75 73 75 73 75 73 75 73 75 73 75 73 75 75 73 75 73 75 73 75 73 75 73 75 73 75 75 73 75 73 75 75 75 75 75 75 75 75 75 75	79 77 76 82 74 80 73 74 72 71 69 68 8000 66 HZ DB 82 80 74 72 71
900 800 700 600 1200 600 100 450 900 800 700 60 /EXH ENGIN 500 ENGIN 500 SPEED RPM 1200 1100 1000 900 800 700	440.4 309.3 207.2 130 044.0 75 604.2 55 604.2 440.4 309.3 207.2 AUST Source POWER BKW 1.044.0 804.1 75.5 55.1 POWER 1.044.0 804.1 604.2 440.4 309.3 207.2	591 415 278 175 078 101 74 810 74 810 74 591 415 278 Pressure Par 74 POWER 1.400 1.078 810 591 415 278	94 92 91 89 93 88 91 88 87 86 84 ta (OBGF) over§1 L DB(A) 93 91 89 87 86 87 86 84	104 102 100 99 97 97 96 97 95 94 92 GPist 125 89 HZ 90 125 89 97 97 97 97 97 95 94 92	93 91 90 88 87 87 88 88 83 86 83 ance 250 80 HZ 94 92 88 86 85 83	90 88 87 85 84 85 83 82 80 15 Meta 78 500 78 500 78 500 78 500 78 500 78 500 78 500 78 500 78 500 78 500 78 500 78 500 78 500 78 500 78 500 78 500 78 500 78 500 78 500 78 500 500 78 500 78 500 78 500 78 500 78 500 78 500 78 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500	88 87 85 84 83 82 80 79 ers (7749. 100075 HZ DB 86 84 83 82 80 79	88 86 85 82 82 83 82 83 82 83 81 80 76 2000 76 2000 75 HZ DB 87 85 83 81 80 78	83 81 80 78 87 77 78 77 78 75 73 72 71 4000 70 HZ DB 87 85 78 76 75 73 72 71 400 70 71 70 70 71 70 70 71 70 70 73 72 73 73 72 73 72 73 73 72 73 73 72 73 73 72 73 73 72 73 73 72 70 70 70 70 70 70 70 70 70 70	79 77 76 82 74 80 73 74 72 71 69 68 8000 66 HZ DB 82 80 74 72 71 69

	Performa	nce Numbe	r: DM8713	Char	nge Level:	01					
Sales Model: Application: Rating Level:	MA常服臣 PRC B-R会J/NG (H ⁸⁰⁰ 700 MEGHANIC	EAVY 4404 309.3 207.2 AL Sound	415 278 Pressure ₁ Dat			Rated Rated 92 91 ance90	Speed Powe 9 Powe 8 8 8 1 Meter	KW): ⁹⁴ 1, SHP): ₉₄ 1, 92 rs (9 3 .3	044.0 ⁹⁵ 400 ₉₄ 93 Fe<u>st</u>)	93 92 91 90 90 89	96 95 94 94 93 92
EI S	450	NGINE 75.5 55.1 OWER	ENGINE 74 POWER	OVERAJE	125 ⁹³ 92 HZ	250 ⁹⁰ HZ	500 ⁸⁶ HZ	1000 ⁹¹ HZ	2000 ⁹¹ HZ	4000 ⁸⁸ НZ	8000 ⁹² HZ
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1200	1.044.0	1.400	101	97	94	90	95	96	93	96
	1100	804.1	1,078	100	96	94	89	94	95	92	95
	1000	604.2	810	99	96	93	89	94	95	91	95
	900	440.4	591	99	95 95	92 92	88	93	94 93	91 00	94
	800 700	309.3	415 278	98 97	95 94	92 91	88 87	92 92	93 93	90 90	94 93
	coo1200	207.2 130:544.0	1 71 .400	97 89	94 93 85	90 82	87 86 78	92 91 83	93 92 ⁸⁴	89 81	93 92 84
	E001100	75.504.0	101,078	96 ⁸⁸	93 84	90 ⁸²	86 77	91 ⁸²	91 ⁸³	88 80	92 83
	4501000	55 904.2	74 810	96 ⁸⁷	92 ⁸⁴	₉₀ 81	85 77	₉₀ 82	91 83	₈₈ 80	91 ⁸³
	900	440.4	591	87	83	80	76	81	82	79	82
	800	309.3	415	86	83	80	76	81	81	78	82
		207.2	278 Pressure ₁ Dat	85 a (OBGE)	82 Dist	79 ance 7 9	75 7 Mheeter	s (72 3.	81 0 Feget)	78 77	81 80
		75 5	101		81	78	74	79	80	76	80 80
El	450	NGINE 55.1	ENGINE 74 POWER		125 81 80 HZ	250 78 HZ	500 73 HZ	1000 ⁷⁹ HZ	2000 ⁸⁰ HZ	4000 ⁷⁶ HZ	8000 ⁸⁰ HZ
		•••••			ΠZ	112	112			116	Π Ζ
	RPM	BKW	BHP	DB(A)	nz DB	DB	DB	DB	DB	DB	DB
				DB(A) 89							
	RPM	BKW	BHP	. ,	DB	DB	DB	DB	DB	DB	DB
	RPM 1200 1100 1000	BKW 1.044.0 804.1 604.2	BHP 1.400 1.078 810	89 88 87	DB 85 84 84	DB 82 82 81	DB 78 77 77	DB 83 82 82	DB 84 83 83	DB 81 80 80	DB 84 83 83
	RPM 1200 1100 1000 900	BKW 1.044.0 804.1 604.2 440.4	BHP 1.400 1.078 810 591	89 88 87 87 87	DB 85 84 84 83	DB 82 82 81 80	DB 78 77 77 76	DB 83 82 82 81	DB 84 83 83 82	DB 81 80 80 79	DB 84 83 83 82
	RPM 1200 1100 1000 900 800	BKW 1.044.0 804.1 604.2 440.4 309.3	BHP 1.400 1.078 810 591 415	89 88 87 87 87 86	DB 85 84 84 83 83	DB 82 82 81 80 80	DB 78 77 77 76 76 76	DB 83 82 82 81 81	DB 84 83 83 82 81	DB 81 80 80 79 78	DB 84 83 83 82 82
	RPM 1200 1100 900 800 700	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 421.044.0	BHP 1.400 1.078 810 591 415 278 400	89 88 87 87 86 85 82	DB 85 84 83 83 83 82 70	DB 82 82 81 80 80 79 77	DB 78 77 77 76 76 75 72	DB 83 82 82 81 81 80 77	DB 84 83 83 82 81 81 81 78	DB 81 80 80 79 78 78 78 78	DB 84 83 83 82 82 82 81 78
	RPM 1200 1100 900 800 700 6001200 5001100	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 421.044.0	BHP 1.400 1.078 810 591 415 278 177,400	89 88 87 87 86 85 85 85 85	DB 85 84 83 83 83 82 81 79 81 70	DB 82 82 81 80 80 79 79 79 77 70	DB 78 77 77 76 76 76 75 74 72	DB 83 82 82 81 81 81 80 79 77	DB 84 83 83 82 81 81 80 78	DB 81 80 80 79 78 78 78 77 75 77	DB 84 83 83 82 82 82 81 80 78
	RPM 1200 1100 900 800 700 6001200 5001100	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 130.844.0 75.804.1 75.804.1	BHP 1.400 1.078 810 591 415 278 175,400 101,078 101,078	89 88 87 87 86 85 85 85 82 82 82	DB 85 84 83 83 83 82 81 79 81 79 81 79 80 78	DB 82 82 81 80 80 79 79 77 76 76 76	DB 78 77 76 76 76 75 74 72 74 72 74 72 73 71	DB 83 82 82 81 81 80 79 77 79 77 79 76	DB 84 83 83 82 81 81 81 80 78 80 78 70 77	DB 81 80 79 78 77 75 77 76 74 76 74 76 74	DB 84 83 82 82 81 80 78 80 78 80 78
	RPM 1200 1100 900 800 700 6001200 5001100 5001100 900	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 130.8 44.0 130.8 44.0 15.8 04.1 5.6 04.2 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 45.0 44.0 44.0 45.0 44.0 45.0 44.0	BHP 1.400 1.078 810 591 415 278 175,400 101,078 101,078 74 810 591	89 88 87 87 86 85 85 83 84 82 84 82 84 82 84 81	DB 85 84 83 83 83 82 79 81 79 81 79 81 78 80 77	DB 82 82 81 80 80 79 79 77 79 77 76 78 76 75 75	DB 78 77 76 76 75 74 72 74 73 70	DB 83 82 82 81 81 80 79 77 77 77 77 77 76 76 75	DB 84 83 83 82 81 81 80 78 80 78 80 77 77 76	DB 81 80 79 78 77 76 74 76 74 76 74 73	DB 84 83 82 81 80 78 80 77 76
	RPM 1200 1100 1000 900 800 700 1200 600 1200 600 1000 500 1000 900 800	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 130.544.0 75.804.1 75.804.1 55.604.2 440.4 309.3	BHP 1.400 1.078 810 591 415 278 175,400 101,078 74,810 591 415	89 88 87 87 86 85 85 85 83 84 82 84 82 84 81 80	DB 85 84 83 82 79 81 79 81 78 77	DB 82 82 81 80 80 79 79 77 78 76 78 76 75 75 75 75 74	DB 78 77 76 75 74 73 70 70	DB 83 82 81 81 80 79 77 77 77 77 76 76 75 75	DB 84 83 82 81 81 80 78 80 78 80 77 79 76 76 76	DB 81 80 79 78 77 75 76 74 76 74 76 74 73 72	DB 84 83 82 82 81 80 78 80 78 80 78 80 77 76 76 76
	RPM 1200 1100 900 800 700 600 1200 600 1200 500 1100 450 1000 450 900 800 700	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 130.844.0 130.804.1 75.804.1 55.604.2 55.604.2 309.3 207.2	BHP 1.400 1.078 810 591 415 278 175,400 101,078 101,078 101,078 101,078 591 415 278	89 88 87 87 86 85 85 83 85 83 84 82 84 82 84 81 80 80	DB 85 84 83 83 82 79 81 79 81 79 80 78 77 77 76	DB 82 81 80 80 79 79 77 76 76 75 75 75 74 73	DB 78 77 77 76 76 76 75 74 72 74 72 74 72 74 70 70 69	DB 83 82 81 81 79 77 79 77 78 75 74	DB 84 83 83 82 81 80 78 80 78 80 78 80 78 80 77 79 76 76 75	DB 81 80 79 78 77 76 74 76 74 73 72	DB 84 83 82 81 78 80 78 80 77 76 76 75
	RPM 1200 1100 900 800 700 600 1200 600 1200 600 1200 500 1100 900 800 700 MEGHANIC	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 130.5 804.1 55.604.2 55.604.2 440.4 309.3 207.2 440.4 309.3 207.2 440.4 309.3 207.2 440.4 309.3 207.2 55.604.2 440.4 309.3 207.2 55.604.2 440.4 309.3 207.2 55.604.2 440.4 309.3 207.2 55.604.2 440.4 309.3 207.2 55.604.2 55.604.2 55.604.2 55.604.2 55.604.2 55.604.2 55.604.2 55.604.2 55.604.2 55.604.2 55.604.2 55.604.2 55.604.2 55.604.2 55.604.2 55.604.2 55.604.2 50.72 55.604.2 55.604.2 55.604.2 50.72 55.604.2 50.72 55.604.2 50.72 55.604.2 50.72	BHP 1.400 1.078 810 591 415 278 175,400 101,078 74,810 591 415 278 Pressure Date 101	89 88 87 87 86 85 85 85 85 83 84 82 84 82 84 82 84 82 84 82 80 80 a (OBGE)	DB 85 84 84 83 82 79 81 79 81 79 80 78 77 76 29 51 75 75	DB 82 81 80 80 79 79 77 78 76 75 75 75 75 75 74 73 ance 7 3	DB 78 77 77 76 76 75 74 72 74 72 74 72 74 72 74 72 74 70 70 9 15 Matter 68	DB 83 82 82 81 81 80 79 77 79 77 79 77 78 76 75 75 74 74 74 74 74 74 74 74 74 74	DB 84 83 83 82 81 80 78 80 78 80 78 80 78 80 78 70 76 76 75 2 Feet)	DB 81 80 80 79 78 77 75 76 74 76 74 76 72 71	DB 84 83 82 81 80 78 80 79 76 75 75
EF	RPM 1200 1100 1000 900 800 700 6001200 6001200 5001100 900 800 700 900 800 700 MESCHANIC NGINERSO	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 130.844.0 130.804.1 75.804.1 55.604.2 55.604.2 309.3 207.2	BHP 1.400 1.078 810 591 415 278 175,400 101,078 101,078 101,078 101,078 591 415 278	89 88 87 87 86 85 85 83 85 83 84 82 84 82 84 81 80 80	DB 85 84 83 83 82 79 81 79 81 79 80 78 77 77 76	DB 82 81 80 80 79 79 77 76 76 75 75 75 74 73	DB 78 77 77 76 76 76 75 74 72 74 72 74 72 74 70 70 69	DB 83 82 81 81 79 77 79 77 78 75 74	DB 84 83 83 82 81 80 78 80 78 80 78 80 78 80 77 79 76 76 75	DB 81 80 79 78 77 76 74 76 74 73 72	DB 84 83 82 81 78 80 78 80 77 76 76 75
EF	RPM 1200 1100 1000 900 800 700 6001200 6001200 5001100 900 800 700 900 800 700 MESCHANIC NGINERSO	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 130.944.0 130.944.0 130.944.1 55.604.2 55.604.2 440.4 309.3 207.2 440.4 309.3 207.2 440.4 309.3 207.2 55.5 NGINE 75.5 55.1	BHP 1.400 1.078 810 591 415 278 175,400 101,078 74 810 591 415 278 Pressure Pressure 101 ENGINE 74	89 88 87 87 86 85 85 85 85 83 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 80 80 80 80 80	DB 85 84 83 83 82 79 81 79 81 79 80 75 75 75 75	DB 82 82 81 80 79 79 77 78 76 75 74 73 ance ⁷³ 250 72 72	DB 78 77 77 76 75 74 72 74 72 74 72 74 72 74 72 74 70 69 15 Mater 500 68	DB 83 82 81 81 80 79 77 77 76 75 75 75 74 9. 74 9. 73 1000 73	DB 84 83 83 82 81 81 80 78 80 78 80 78 80 78 80 78 80 77 76 76 76 75 2 Feet) 2000 74 2000 74	DB 81 80 80 79 78 77 75 76 74 76 74 76 74 72 72 72 71 4000 70	DB 84 83 82 82 81 80 78 80 78 80 77 76 76 75 75 8000 74 8000 74
Ef	RPM 1200 1100 1000 900 800 700 6001200 5001100 5001000 450 700 MESCHANIC NGINE PEED	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 130.944.0 75.804.1 75.804.1 55.604.2 440.4 309.3 207.2 440.4 309.3 207.2 55.604.2 55.5 55.1 WER	BHP 1.400 1.078 810 591 415 278 175,400 101,078 74 810 591 415 278 Pressure Pressure Pressure 101 POWER	89 88 87 87 86 85 85 85 83 84 82 84 82 84 81 80 80 a (OBC/6) 0VERA/8	DB 85 84 84 83 82 79 81 79 81 79 81 79 80 77 76 24 75 HZ 75 HZ	DB 82 82 81 80 79 79 77 78 76 75 75 74 73 ance ⁷³ 250 72 HZ	DB 78 77 77 76 75 74 72 74 72 74 72 74 72 74 72 74 70 69 15 Mæter 500 ⁶⁸ HZ	DB 83 82 82 81 81 80 79 77 76 76 75 75 75 74 9. 1000 73 HZ	DB 84 83 83 82 81 81 80 78 80 78 80 78 80 78 80 78 80 77 76 76 76 76 76 76 76 76 76	DB 81 80 80 79 78 77 75 76 74 76 74 76 73 72 72 71 4000 71 HZ	DB 84 83 82 82 81 78 80 78 80 78 80 77 76 76 76 75 75 8000 74 HZ
Ef	RPM 1200 1100 1000 900 800 700 6001200 6001200 5001100 5001100 450900 800 700 MESCHANIC NGINE PEED RPM	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 130.844.0 75.804.1 75.804.1 55.604.2 440.4 309.3 207.2 440.4 309.3 207.2 55.604.2 55.1 Source S5.1 BKW	BHP 1.400 1.078 810 591 415 278 175,400 101,078 74 810 591 415 278 Pressure Pressure Pressure 101 POWER BHP	89 88 87 87 86 85 85 85 83 84 82 84 81 80 80 a (OBC/6) 0VERA/8 DB(A)	DB 85 84 83 82 79 81 79 81 78 80 77 76 Pist 75 HZ DB	DB 82 82 81 80 79 79 77 78 76 75 74 73 ance73 72 72 HZ DB	DB 78 77 77 76 76 75 74 72 74 72 74 72 74 72 74 70 69 15 Meter 500 68 HZ DB	DB 83 82 82 81 80 79 77 76 76 75 75 75 74 9. 1000 73 HZ DB	DB 84 83 83 82 81 81 80 78 80 78 80 78 80 78 80 78 80 77 76 76 76 75 2 Feet) 2000 74 HZ DB	DB 81 80 80 79 78 77 75 76 74 76 74 76 74 72 72 71 4000 71 HZ DB	DB 84 83 82 82 81 78 80 78 80 78 80 77 76 76 75 75 75 8000 74 HZ DB
Et S	RPM 1200 1100 1000 900 800 700 500 1100 500 1100 450 900 800 700 MEGHANIC NGINE 500 P RPM 1200 1100 1000	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 207.2 804.1 75.8 04.2 55.6 04.2 55.7 55.1 0 0 0 0 0 0 0 0 0 0 0 0 0	BHP 1.400 1.078 810 591 415 278 175,400 101,078 810 591 415 278 Pressure1Dat 101 74 90WER BHP 1.400 1.078 810	89 88 87 87 86 85 85 85 82 84 82 84 82 81 80 80 a (OBC5) OVERA 8 DB(A) 83 82 82 82	DB 85 84 84 83 83 82 79 81 79 80 78 77 76 95 125 75 125 75 125 75 125 75 75 75 75 75 75 75 75 75 7	DB 82 82 81 80 80 79 77 78 76 75 75 72 HZ DB 77 76 75	DB 78 77 77 76 76 74 72 74 72 74 72 74 70 69 15 Meter 68 b B 72 72 71	DB 83 82 82 81 81 80 79 77 79 77 78 76 74 73 1000 73 HZ 77 77 76	DB 84 83 83 82 81 80 78 80 78 79 76 76 76 76 76 76 76 76 76 76	DB 81 80 80 79 78 77 75 77 74 76 74 76 74 72 71 4000 70 HZ DB 74 74 74 71 70 71 70 71 70 71 70 71 70 71 70 71 72 72 71 72 72 71 72 72 71 72 72 71 72 72 72 71 72 72 72 72 71 72 72 72 72 72 72 72 72 72 72	DB 84 83 82 82 80 78 80 79 76 75 75 8000 74 HZ DB 78 77
Et S	RPM 1200 1100 1000 900 800 700 600 1200 600 1200 500 1100 900 800 700 ME6CHANIC NGINE500 P RPM 1200 1100 1000 900	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 130.94.0 75.8 04.1 55.7 04.2 55.7 04.2 55.7 04.2 55.7 04.2 75.5 04.2 75.5 05.1 0WER BKW 1.044.0 804.1 604.2 440.4	BHP 1.400 1.078 810 591 415 278 400 101,078 74 810 74 810 591 415 278 Pressure1 Pate ENGINE BHP 1.400 1.078 810 591	89 88 87 87 86 85 85 85 82 84 82 84 82 81 0VERA 78 DB(A) 83 82 82 81	DB 85 84 83 82 81 79 80 78 77 76 95 125 75 DB 79 79 78 77	DB 82 82 81 80 79 79 77 76 75 72 72 72 72 72 77 76 75 75 75 75	DB 78 77 76 76 75 74 72 74 72 74 70 70 69 15 Meter 500 68 HZ 72 72 72 72 73 70 70 70 69 15 50 68 HZ 72 72 71 70 70 70 70 70 70 70 70 70 70	DB 83 82 82 81 81 80 79 77 77 76 75 74 92 75 75 74 75 75 74 92 75 75 75 75 74 92 75 75 75 75 75 75 75 75 75 75	DB 84 83 83 82 81 81 80 78 80 78 76 76 76 76 76 76 76 76 76 76	DB 81 80 80 79 78 77 75 76 74 76 74 76 74 72 72 72 72 71 4000 71 4000 70 HZ 75 74 73 75 74 73 75 74 73 75 74 75 74 75 74 75 74 75 74 75 74 75 75 74 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 75 74 75 75 75 74 75 75 75 75 74 75 75 75 74 75 75 75 74 75 75 75 75 74 75 75 75 75 75 75 74 75 75 75 75 75 74 75 75 75 75 75 75 75 75 74 75 75 75 75 75 75 75 75 74 70 75 75 75 75 75 76 74 70 70 70 70 70 70 70 70 70 70	DB 84 83 82 82 81 80 78 80 77 76 76 75 75 8000 74 HZ 78 78 78 77 76
Et S	RPM 1200 1100 1000 900 800 700 6001200 6001200 6001000 4501000 900 800 700 MEGGHANIC NGINÉO PEED PRM 1200 1100 900 800	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 130.944.0 75.904.1 75.904.2 55.604.2 55.604.2 207.2 AL Sound NGINE 75.5 55.1 BKW 1.044.0 804.1 604.2 440.4 309.3	BHP 1.400 1.078 810 591 415 278 175,400 101,078 74 810 74 810 Fressure Pressure Pressure BHP 1.400 1.078 810 591 415 278 Pressure 101 74 80 591 415 278 101 591 415 278 101 591 415 278 101 591 415 278 101 591 415 278 101 591 415 278 101 591 415 278 101 591 415 278 101 591 415 278 101 591 415 278 101 591 415 278 101 74 810 591 415 278 101 591 415 278 101 74 810 591 415 278 101 74 810 591 415 278 101 74 810 591 415 278 101 74 810 591 415 278 101 74 810 591 415 278 101 74 810 591 415 278 101 74 810 101 74 810 101 74 810 101 74 810 101 74 810 101 74 810 101 74 810 101 74 810 101 74 810 591 415 278 810 101 74 810 591 415 278 810 101 74 810 591 415 278 810 101 74 810 591 415 591 415 591 415 591 415 591 415 591 415 591 415 591 415 591 415 591 415 591 415 591 415 591 415 591 415 591 415 591 415 591 415 591 415 591 415 501 501 501 501 501 501 501 5	89 88 87 87 86 85 85 85 83 84 82 84 81 80 a (OBCF) OVERA 78 DB(A) 83 82 82 81 80	DB 85 84 83 82 79 80 77 76 125 HZ 79 79 79 79 79 78 77 76 125 75 126 79 79 78 77 77 77 76 125 126 79 79 78 77 77 77 77 77 77 77 77	DB 82 82 81 80 79 79 77 76 75 74 72 72 HZ 77 76 75 74 75 74 75 74 75 74 75 74 75 74 75 74 76 75 76 76 75 72 72 76 75 76 77 76 76 75 72 72 72 75 74 76 75 72 72 72 72 72 72 72 72 72 72	DB 78 77 76 76 75 74 72 74 70 70 69 15 Meter 500 68 HZ 72 72 72 72 72 71 70 70 70 69 15 50 68 HZ 75 72 74 70 70 70 70 70 70 70 70 70 70	DB 83 82 82 81 81 80 79 77 77 76 75 75 75 75 75 75 75 75 75 75	DB 84 83 83 82 81 81 80 78 79 76 76 76 76 75 200074 HZ 78 78 78 77 76 76 76 75 76 76 76 76 75 76 76 76 76 76 76 76 76 76 76	DB 81 80 80 79 78 77 75 74 70 72 72 71 4000 70 HZ 75 74 73 72 73 72 73 72	DB 84 83 82 82 81 80 78 80 76 76 76 76 75 75 8000 74 HZ 78 78 78 78 77 76 76 76 74 HZ 78 78 78 78 78 74 78 78 78 78 76 76 76 76 76 76 76 76 76 76
Et S	RPM 1200 1100 1000 900 800 700 6001200 5001100 5001100 450 900 800 700 MESCHANIC NGINE PEED PRM 1200 1100 900 800 700	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 130.844.0 75.804.1 55.604.2 440.4 309.3 207.2 AL Segnd NGINE 75.5 55.1 BKW 1.044.0 804.1 604.2 440.4 309.3 207.2	BHP 1.400 1.078 810 591 415 278 278 175,400 101,078 591 415 278 Pressure Pressure Pressure 101 POWER BHP 1.400 1.078 810 591 415 278	89 88 87 87 87 85 85 85 83 84 82 84 81 80 overa 78 78 overa 78 78 DB(A) 83 82 81 80 80 80 83 82 81 80 80 80 80 80 81 80 80 80 81 83 82 82 81 80 80 80 80 80 80 80 80 80 80 80 80 80	DB 85 84 83 82 79 80 77 76 125 HZ 79 79 79 79 79 78 77 76 125 75 72 73 77 76	DB 82 82 81 80 79 79 77 78 76 75 75 74 75 75 74 73 80 72 72 72 72 72 72 72 72 72 72	DB 78 77 77 76 76 75 74 72 74 72 70 69 15 Meter 500 68 HZ 72 72 72 71 70 69 15 17 70 70 69 15 70 70 70 70 70 70 70 70 70 70	DB 83 82 82 81 81 80 79 77 76 75 75 75 75 75 75 75 75 75 75	DB 84 83 83 82 81 81 80 78 80 78 76 76 75 2 Feet) 2000 74 HZ 78 78 78 77 76 76 75 75 77 76 75 77 76 75 77 76 75 78 78 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 78 78 78 78 77 76 75 77 76 75 77 76 75 77 76 75 77 76 77 76 75 77 76 75 77 77 76 75 77 76 75 77 77 76 77 76 75 77 76 77 77 76 77 77 76 77 77	DB 81 80 79 78 77 76 74 76 71 4000 71 BDB 75 74 73 72 72 73 72 72	DB 84 83 82 81 80 78 70 76 75 75 76 75 76 77 78 77 76 76 76 77 76 76 77 76 75
Et S	RPM 1200 1100 1000 900 800 700 6001200 6001200 6001200 6001200 6001200 900 800 700 MEECHANIC NGIN200 PRM 1200 1100 900 800 700 600	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 130.8 804.1 75.8 04.1 55.6 04.2 440.4 309.3 207.2 440.4 309.3 207.2 55.1 BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 1.044.0 804.1 55.5 55.1 8 0 8 1.044.0 8 1.044.0 8 1.044.0 1.044.0 8 1.044.0 1.045.0	BHP 1.400 1.078 810 591 415 278 175,400 101,078 101,078 591 415 278 Pressure1Pat ENGINE 101 POWER 74 BHP 1.400 1.078 810 591 415 278 101 107 278 101 101 278 101 107 278 101 107 278 101 107 278 101 107 107 107 107 107 107 107	89 88 87 87 86 85 85 85 83 84 82 84 82 84 82 80 a (OBCF) over 878 80 a (OBCF) over 878 80 a (OBCF) over 878 80 80 80 80 81 83 82 82 81 80 83 82 82 81 80 79	DB 85 84 83 82 79 81 79 76 205 125 75 125 75 DB 79 78 77 76 79 78 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 76 76 76 76	DB 82 82 81 80 80 79 79 77 78 75 74 73 72 72 72 72 72 72 72 72 72 72	DB 78 77 77 76 76 75 74 72 74 72 70 69 68 HZ 72 72 71 70 68 68 68 HZ 72 72 71 70 69 69 69	DB 83 82 82 81 80 79 77 79 77 76 75 75 75 75 75 77 76 75 75 77 77 76 75 75 77 77 77 76 75 75 75 77 77 76 75 75 75 75 75 75 75 75 75 75	DB 84 83 83 82 81 81 78 79 76 76 76 76 76 75 2000 ⁷⁴ 12000 ⁷⁴ 12000 ⁷⁴ 12000 78 78 77 76 75 77 76 75 77 77 76 76 75 77 77 76 76 75 77 77 76 76 75 77 77 76 76 75 77 77 76 76 75 77 77 76 76 75 77 77 76 76 75 77 77 76 76 75 77 77 76 76 75 77 77 76 76 75 77 77 76 75 77 77 76 76 75 77 77 76 75 77 77 76 75 77 77 76 75 77 77 76 75 77 77 76 75 77 77 76 75 77 77 76 75 77 77 76 75 77 77 76 75 77 77 76 75 77 77 76 75 77 77 76 75 77 77 76 77 77 77 76 75 77 77 77 76 77 77 77 76 75 77 77 77 77 77 77 77 77 77	DB 81 80 80 79 78 77 75 76 74 70 72 71 4000 70 HZ 75 74 74 74 73 72 72 71 71 4000 71 72 72 71 73 72 72 71 73 72 73 72 71 73 72 72 71 73 72 72 71 73 72 72 71 73 72 72 71 73 72 72 71 71 73 72 72 71 71 72 72 71 73 75 72 72 71 72 72 71 72 72 71 72 72 71 72 72 72 71 72 72 71 72 72 72 72 72 71 72 72 72 72 72 72 72 72 72 72	DB 84 83 82 81 80 80 79 76 75 76 77 76 77 78 77 76 75 76 77 76 77 76 75 75 77 76 75 75 75
Et S	RPM 1200 1100 1000 900 800 700 6001200 5001100 5001100 450 900 800 700 MESCHANIC NGINE PEED PRM 1200 1100 900 800 700	BKW 1.044.0 804.1 604.2 440.4 309.3 207.2 130.844.0 75.804.1 55.604.2 440.4 309.3 207.2 AL Segnd NGINE 75.5 55.1 BKW 1.044.0 804.1 604.2 440.4 309.3 207.2	BHP 1.400 1.078 810 591 415 278 278 175,400 101,078 591 415 278 Pressure Pressure Pressure 101 POWER BHP 1.400 1.078 810 591 415 278	89 88 87 87 87 85 85 85 83 84 82 84 81 80 overa 78 78 overa 78 78 DB(A) 83 82 81 80 80 80 83 82 81 80 80 80 80 80 81 80 80 80 81 83 82 82 81 80 80 80 80 80 80 80 80 80 80 80 80 80	DB 85 84 83 82 79 80 77 76 125 HZ 79 79 79 79 79 78 77 76 125 75 72 73 77 76	DB 82 82 81 80 79 79 77 78 76 75 75 74 75 75 74 73 80 72 72 72 72 72 72 72 72 72 72	DB 78 77 77 76 76 75 74 72 74 72 70 69 15 Meter 500 68 HZ 72 72 72 71 70 69 15 17 70 70 69 15 70 70 70 70 70 70 70 70 70 70	DB 83 82 82 81 81 80 79 77 76 75 75 75 75 75 75 75 75 75 75	DB 84 83 83 82 81 81 80 78 80 78 76 76 75 2 Feet) 2000 74 HZ 78 78 78 77 76 76 75 75 77 76 75 77 76 75 77 76 75 78 78 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 75 77 76 75 77 76 75 77 76 75 77 76 75 77 76 75 78 78 78 78 77 76 75 77 76 75 77 76 75 77 76 75 77 76 77 76 75 77 76 75 77 77 76 75 77 76 75 77 77 76 77 76 75 77 76 77 77 76 77 77 76 77 77	DB 81 80 79 78 77 76 74 76 71 4000 71 BDB 75 74 73 72 72 73 72 72	DB 84 83 82 81 80 78 70 76 75 75 76 75 76 77 78 77 76 76 76 77 76 76 77 76 75

Perfor	mance Numbe	er: DM8714	Ch	ange Level:	01					
Sales Model: 3512200 Application: MARINE P	969.5 ROPULS	1,300 1,001	112 110 109	117 115 113		Speed5(F Powef53B			105 103 98	103 101 93
Rating Level: A Rad NG		TED CONTIN		113	Ratec	I Power1(E	3HP):102	300 103	96 96	93 91
800	287.3	385	105	109	103	99	98	101	94	90
700	192.4	258		108	102	98	97		93	88
	AUST Soperned	94	•		ance 01	1.5 Meter	• • •	,	92	87
ENGIN ⁵⁰⁰ 450 SPEED	ENGINE 70.1 51.1 POWER	POWER 69	over	125 ¹⁰⁵ 105 HZ	250 ⁹⁹ 99 HZ	500 ⁹⁵ 95 HZ	1000 ⁹⁴ HZ	2000 ⁹⁷ HZ	4000 ₉₀ нz	8000 ⁸⁶ HZ
RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
1200	969.5	1.300	112	117	112	105	104	107	105	103
1100 1000	746.8 561.1	1.001 752	110 109	115 113	110 107	103 103	102 102	105 105	103 98	101 93
900	409.0	548	103	111	107	103	102	103	96	91
800	287.3	385	105	109	103	99	98	101	94	90
700	192.4	258	104 00	108 105	102	98 07 93	97 06 92	100 02	93 02	88 。。
6001200 5001100	192.4 121.269.5 70.746.8	258 163,300 94,001	103 99 101 97	108 107 105 105 103	101 ¹⁰⁰ 98	91	90 04	99 93 07 91	92 93 90 91	87 88 86 86
450 ¹⁰⁰⁰	70.110.0 51.561.1	94,001 69 752	101 95 101 95	105 103 105 103	99 98 99 94	95 91 95 91	94 91 94 90	97 ⁹¹ 97 ⁸⁹	90 ⁹¹ 90 ⁸⁴	86 ⁸⁶ 85 ⁸⁰
450 900	409.0	548	93	105 101	99 92	95 89	⁹⁴ 88	87	90 82	78
800	287.3	385	92	100	91	88	86	86	81	77
700 20 51 1	192.4 AUST Soperned	258 Proceuro Dat		98 Dict	89 ance ₈₈	86 7 Meste	⁸⁵ rs (823.	0 East)	79	75
60 6~U	70.1	94				7 Nggle		,	78 77	74 73
ENGINE SPEED	ENGINE 51.1	ENGINE 69	OVERAL	125 ⁹⁶ 95	250 ⁸⁷ ₈₆	500 ₈₃	1000 ⁸³ 82	2000 ⁸²	4000 ⁷⁷ ₇₆	8000 ⁷³
SPEED	POWER	POWER	01	HZ	HΖ ÕÕ	HZ Õ	HZ	HZÖ	HΖ΄	HZ
RPM	POWER BKW	BHP	DB(A)	HZ ³³ DB	HZ ⁰⁰ DB	HZ OO DB	HZ ^{OL} DB	HZ T DB	HZ DB	HZ DB
		POWER BHP 1.300	99	DB 105	HZ	HZ DB 93	HZ DB 92	HZ	HZ	HZ DB 88
	BKW 969.5 746.8	POWER BHP 1.300 1,001	99 97	HZ DB 105 103	DB 100 98	HZ DB 93 91	HZ DB 92 91	HZ DB 93 91	HZ DB 93 91	HZ DB 88 86
RPM 1200 1100 1000	BKW 969.5 746.8 561.1	POWER BHP 1.300 1,001 752	99 97 95	HZ DB 105 103 103	HZ DB 100 98 94	HZ DB 93 91 91	HZ DB 92 91 90	HZ DB 93 91 89	HZ DB 93 91 84	HZ DB 88 86 80
RPM 1200 1100 1000 900	BKW 969.5 746.8 561.1 409.0	POWER BHP 1.300 1.001 752 548	99 97 95 93	HZ DB 105 103 103 101	HZ DB 100 98 94 92	HZ DB 93 91 91 89	HZ DB 92 91 90 88	HZ DB 93 91 89 87	HZ DB 93 91 84 82	HZ DB 88 86 80 78
RPM 1200 1100 1000 900 800 700	BKW 969.5 746.8 561.1 409.0 287.3	POWER BHP 1.300 1.001 752 548 385	99 97 95 93 92 90	HZ DB 105 103 103 101 100 98	HZ DB 100 98 94 92 91 89	HZ DB 93 91 91 89 88 88 86	HZ DB 92 91 90 88 86 85	HZ DB 93 91 89 87 86 84	HZ DB 93 91 84 82 81 79	HZ DB 88 86 80 78 77 75
RPM 1200 1100 900 800 700 6001200	BKW 969.5 746.8 561.1 409.0 287.3 192.4 192.4 402.969.5	POWER BHP 1.300 1.001 752 548 385 258 453 300	99 97 95 93 92 90 89 92	HZ DB 105 103 103 101 100 98 97 99	HZ DB 100 98 94 92 91 89 88 93	HZ DB 93 91 91 89 88 86 85 86	HZ DB 92 91 90 88 86 85 84 86	HZ DB 93 91 89 87 86 84 83 87	HZ DB 93 91 84 82 81 79 78 86	HZ DB 88 86 80 78 77 75 74 81 74 81
RPM 1200 1100 900 800 700 6001200 6001200 6001100	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.999.5 70.746.8 70.746.8	POWER BHP 1.300 1.001 752 548 385 258 163,300 cl.001	99 97 95 93 92 90 90 92 89 90 88 90	HZ DB 105 103 103 101 100 98 97 99 96 97 97 97 97 97 97 97	HZ DB 100 98 94 92 91 89 88 93 88 93 87 91	HZ DB 93 91 91 89 88 86 85 86 85 86 85	HZ DB 92 91 90 88 86 85 84 85 84 86 83 84 84	HZ DB 93 91 89 87 86 84 83 87 82 85 82 82	HZ DB 93 91 84 82 81 79 78 86 77 84 77	HZ DB 88 86 80 78 77 75 74 81 73 79 73 79
RPM 1200 1100 900 800 700 6001200 5001100 4501000	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 51.561.1	POWER BHP 1.300 1.001 752 548 385 258 163,300 163,300 94,001 69,752	99 97 95 93 92 90 92 89 90 87 89 87 89 87 89	HZ DB 105 103 103 101 100 98 97 99 96 97 96 97 95 97	HZ DB 100 98 94 92 91 89 88 93 88 93 87 91 86 88	HZ DB 93 91 91 89 88 86 85 86 85 86 85 84 84 83 85	HZ DB 92 91 90 88 86 85 85 84 85 84 83 84 83	HZ DB 93 91 89 87 86 84 83 87 82 85 81 83	HZ DB 93 91 84 82 81 79 86 78 86 77 84 76 78	HZ DB 88 86 80 78 77 75 74 81 73 79 73 79 72 73
RPM 1200 1100 900 800 700 6001200 6001200 6001100	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.999.5 70.746.8 70.746.8	POWER BHP 1.300 1.001 752 548 385 258 163,300 cl.001	99 97 95 93 92 90 90 92 89 90 88 90	HZ DB 105 103 103 101 100 98 97 99 96 97 97 97 97 97 97 97	HZ DB 100 98 94 92 91 89 88 93 88 93 87 91	HZ DB 93 91 91 89 88 86 85 86 85 86 85	HZ DB 92 91 90 88 86 85 84 85 84 86 83 84 84	HZ DB 93 91 89 87 86 84 83 87 82 85 82 82	HZ DB 93 91 84 82 81 79 78 86 77 84 77	HZ DB 88 86 80 78 77 75 74 81 73 79 73 79
RPM 1200 1100 900 800 700 6001200 6001200 5001100 4501000 900 800 700	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 70.746.8 51.561.1 51.561.1 409.0 287.3 192.4	POWER BHP 1.300 1.001 752 548 385 258 163 300 94 001 94 001 94 052 69 752 69 752 69 752 548 385 258	99 97 95 93 92 90 92 89 92 88 90 87 89 87 87 85 84	HZ DB 105 103 101 101 100 98 97 99 97 99 97 95 97 95 93 93 92	HZ DB 100 98 94 92 91 89 93 88 93 87 91 86 88 86 86 84 83	HZ DB 93 91 89 88 86 85 86 85 86 85 84 84 84 84 83 83 81 80	HZ DB 92 91 90 88 86 85 84 86 85 84 83 84 83 84 83 82 81 80 78	HZ DB 93 91 89 87 86 84 83 87 82 85 82 85 83 81 83 81 79 78	HZ DB 93 91 84 82 81 79 78 86 77 88 77 88 76 76 76 74 73	HZ DB 88 86 78 77 75 74 81 73 79 73 72 73 72 70 69
RPM 1200 1100 1000 900 800 700 6001200 6001200 5001100 4501000 900 800 700 606 EXH	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.999.5 70.746.8 70.746.8 70.746.8 70.746.8 70.746.8 151.561.1 51.561.1 287.3 192.4 AUST Sound	POWER BHP 1.300 1.001 752 548 385 258 163 300 94 051 69 752 548 385 258 Pressure	99 97 95 93 92 90 92 89 92 88 90 87 89 87 87 85 84	HZ DB 105 103 101 100 98 97 99 97 99 97 95 97 95 97 95 93 92 92 92 92	HZ DB 100 98 94 92 91 88 93 87 91 86 88 87 81 86 88 88 84 84 83 anceg2	HZ DB 93 91 91 89 88 86 85 86 85 86 85 84 85 83 83 83 81 80 15 Meter	HZ DB 92 91 90 88 86 85 84 86 85 84 86 83 82 81 80 78 rs (7 49 .	HZ DB 93 91 89 87 86 84 83 87 82 85 83 81 83 81 79 78 2 Feet)	HZ DB 93 91 84 82 81 79 86 78 86 77 78 76 74 73 72	HZ DB 88 80 78 77 75 74 81 79 73 72 73 72 70 69 67
RPM 1200 1100 900 800 700 6001200 6001200 5001100 4501000 900 800 700	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 70.746.8 51.561.1 51.561.1 409.0 287.3 192.4	POWER BHP 1.300 1.001 752 548 385 258 163 300 94 001 94 001 94 052 69 752 69 752 69 752 548 385 258	99 97 95 93 92 90 92 89 92 88 90 87 89 87 87 85 84	HZ DB 105 103 101 101 100 98 97 99 97 99 97 95 97 95 93 93 92	HZ DB 100 98 94 92 91 89 93 88 93 87 91 86 88 86 86 84 83	HZ DB 93 91 89 88 86 85 86 85 86 85 84 84 84 84 83 83 81 80	HZ DB 92 91 90 88 86 85 84 86 85 84 83 84 83 84 83 82 81 80 78	HZ DB 93 91 89 87 86 84 83 87 82 85 82 85 83 81 83 81 79 78	HZ DB 93 91 84 82 81 79 78 86 77 88 77 88 76 76 76 74 73	HZ DB 88 86 78 77 75 74 81 73 79 73 72 73 72 70 69
RPM 1200 1100 900 800 700 6001200 6001200 5001100 4501000 4501000 900 800 700 60 EXH ENGIN ⁵⁰⁰ 250	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 51.740.8 51.740.9 287.3 192.4 AUST Sound ENGINE 70.1 51.1	POWER BHP 1.300 1.001 752 548 385 258 163 300 94 001 69 752 69 752 69 752 548 385 258 Pressure 281 ENGINE 94 69	99 97 95 93 92 90 92 88 90 87 89 87 87 85 87 85 84 ta (OBGE)	HZ DB 105 103 103 101 100 98 97 97 97 97 97 97 97 97 97 97 97 97 97	HZ DB 100 98 94 92 91 89 93 88 93 87 87 88 86 86 84 83 ance32 250 80	HZ DB 93 91 91 89 88 86 85 86 85 86 85 84 83 83 81 80 77 77 500 77	HZ DB 92 91 90 88 86 85 84 86 83 84 83 82 83 81 80 78 90 78 90 90 90 88 85 84 87 87 90 90 88 87 87 87 90 90 88 86 85 86 87 90 88 86 87 90 88 88 86 87 90 88 87 90 88 86 87 90 88 86 87 87 90 88 87 87 90 88 86 87 87 87 87 87 90 88 88 86 87 87 87 87 87 87 87 87 87 87 87 87 87	HZ DB 93 91 89 87 86 84 83 87 82 85 81 83 81 79 78 2 Feet) 2000 ⁷⁵ 2000 ⁷⁵	HZ DB 93 91 84 82 81 79 78 86 77 88 77 88 76 78 86 76 78 76 76 74 73 72 4000 70	HZ DB 88 86 77 75 74 81 73 79 72 73 72 73 72 70 69 67 66 66 66
RPM 1200 1100 900 800 700 600 ¹ 200 600 ¹ 200 500 ¹ 100 450 ¹ 000 450 ¹ 000 800 700 60 EXH ENGIN ⁵⁰⁰ SPEED RPM 1200	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.9 99.5 70.7 46.8 70.7 46.8 70.7 46.8 70.7 46.8 70.7 46.8 70.7 46.8 70.7 46.8 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 70.7 40.0 287.3 192.4 192.4 70.7 40.0 287.3 192.4 190.1 192.4	POWER BHP 1.300 1.001 752 548 385 258 163 300 94,001 69 752 548 385 258 Pressure BHP 1.300	99 97 95 93 92 90 89 92 88 90 87 89 87 85 87 85 84 A OVERA 1 OVERA 1 DB (A) 92	HZ DB 105 103 101 100 98 97 97 97 97 95 97 95 93 92 Gist 125 89 HZ 89 HZ 99	HZ DB 100 98 94 92 91 88 93 88 93 87 87 86 88 86 84 83 86 86 84 83 80 HZ DB 93	HZ DB 93 91 91 89 88 86 85 86 85 86 84 85 83 81 80 77 77 HZ 77 HZ 500 77 77 HZ	HZ DB 92 90 88 86 85 84 86 83 84 83 83 84 83 83 81 80 78 rs (749. 1000 76 1000 76 HZ 5 B 86	HZ DB 93 91 89 87 86 84 83 87 82 85 81 83 81 83 81 79 78 2000 75 HZ 75 HZ 87	HZ DB 93 91 84 82 81 79 78 86 77 88 76 78 86 77 78 76 76 74 73 72 70 4000 70 HZ DB 86	HZ DB 88 80 77 75 74 81 73 79 73 72 73 72 73 72 70 69 67 69 67 8000 66 HZ 66 HZ 81
RPM 1200 1100 1000 900 800 700 6001200 5001100 4501000 800 700 60 EXH ENGIN500 SPEED RPM 1200 1100	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 70.746.8 70.746.8 192.4 AUST Sound ENGINE BKW 969.5 746.8	POWER BHP 1.300 1.001 752 548 385 258 163 300 94,001 94,001 94,001 94,001 94,001 94,001 94,001 94,001 69,752 548 385 258 Pressure Data ENGINE 94 94 POWER BHP 1.300 1.001	99 97 95 93 92 90 89 92 88 90 87 85 87 85 85 84 corres 81 corres 81 corres 81 corres 81 corres 81 corres 81 corres 81 corres 83 83 85 84 85 85 85 85 85 85 85 85 85 85 85 85 85	HZ DB 105 103 101 101 100 98 97 99 97 95 97 95 93 92 93 93 92 93 93 92 93 93 92 93 93 93 92 93 93 93 93 93 93 93 93 93 93 95 95 95 95 95 95 95 95 95 95 95 95 95	HZ DB 94 92 91 89 93 87 91 87 91 86 86 86 84 83 ance32 250 80 HZ DB 93 91	HZ DB 93 91 89 88 86 85 86 85 84 84 84 85 83 81 80 77 77 HZ 77 BB 86 86 84	HZ DB 92 90 88 86 85 84 86 85 84 86 85 84 86 85 87 87 78 78 78 77 90075 HZ DB 86 84	HZ DB 93 91 89 87 86 84 83 87 82 85 81 83 81 83 81 75 2000 75 HZ DB 87 85	HZ DB 93 91 84 82 81 79 86 78 86 76 78 76 78 76 76 73 72 70 4000 70 HZ DB 86 84	HZ DB 88 80 78 77 75 74 81 79 73 72 73 72 73 72 70 69 67 8000 66 HZ DB 81 79
RPM 1200 1100 900 800 700 6001200 6001200 5001100 4501000 900 800 700 60 EXH ENGIN 500 SPEED RPM 1200 1100 1000	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.7 46.8 70.7 46.8 70.7 46.8 70.7 409.0 287.3 192.4 287.3 192.4 287.3 192.4 10.1 51.1 5	POWER BHP 1.300 1.001 752 548 385 258 163 300 163 300 94 001 94 001 952 548 385 258 Pressure Deal ENGINE 94 POWER 69 POWER BHP 1.300 1.001 752	99 97 95 93 92 90 92 89 92 89 92 87 87 87 85 84 ta (OBGF) OVERA 1 L DB(A) 92 90 89	HZ DB 105 103 101 100 98 97 99 97 95 97 95 93 92 G ist 125 89 HZ 89 HZ 99 97 97 97	HZ DB 100 98 94 92 91 89 93 88 93 87 91 86 86 88 86 83 80 HZ 250 80 HZ 93 91 88	HZ DB 93 91 89 88 86 85 86 85 84 85 83 81 80 15 Metel 77 77 HZ 70 86 86 84 85	HZ DB 92 91 90 88 86 85 84 86 85 84 83 82 81 80 78 77 900 76 HZ 75 DB 86 84 83	HZ DB 93 91 89 87 86 84 83 87 85 83 87 85 83 87 85 83 87 85 83	HZ DB 93 91 84 82 81 79 86 78 84 77 78 76 74 73 73 72 4000 70 HZ DB 86 84 78	HZ DB 88 80 77 75 74 81 77 73 72 73 72 73 72 70 69 67 8000 66 HZ 69 67 8000 66 HZ 79 73
RPM 1200 1100 1000 900 800 700 6001200 6001200 6001100 5001100 900 800 700 60 EXH ENGINE SPEED RPM 1200 1100 1000 900	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.46.8 51.561.1 409.0 287.3 192.4 409.0 287.3 192.4 51.1 51.1 51.1 969.5 746.8 551.1 409.0	POWER BHP 1.300 1.001 752 548 385 258 163 300 163 300 94 001 94 001 94 001 9548 385 258 Pressure₁04 ENGINE 8HP 1.300 1.001 752 548	99 97 95 93 92 90 89 90 87 89 87 85 84 87 85 84 87 85 84 CVER 81 DE (A) 92 90 89 87	HZ DB 105 103 101 100 98 97 95 97 95 92 0 125 89 HZ 89 HZ 99 97 97 95 97 95 97 95 97 95 97 95 92 92 92 92 92 95 92 92 95 92 92 95 92 92 95 92 97 95 92 92 92 97 95 92 92 92 92 95 97 95 92 92 97 95 92 92 97 95 92 92 97 95 92 92 92 97 95 92 92 92 92 92 95 92 92 92 92 92 92 92 92 92 92	HZ DB 100 98 94 92 91 89 87 86 86 84 83 ance32 250 80 91 88 93 91 88 80 93 91 88 86 88 86	HZ DB 93 91 89 88 86 85 86 85 84 85 83 81 80 77 77 HZ 77 HZ 77 HZ 86 86 84 85 83	HZ DB 92 91 90 88 86 85 84 86 85 84 83 82 83 81 80 78 78 78 7749. DB 86 84 83 81	HZ DB 93 91 89 87 86 84 83 87 82 85 83 81 78 2000 75 HZ 75 HZ 75 HZ 85 83 81 81 83 81 81 78 83 81 81 83 81 81 81 83 81 83 81 83 81 81 83 81 83 81 83 81 81 83 81 83 81 81 81 83 81 83 81 83 81 81 83 81 81 81 81 81 85 83 81 83 81 81 81 81 81 81 81 81 81 81	HZ DB 93 91 84 82 81 79 78 86 74 76 74 73 72 4000 70 HZ DB 86 84 87 85 84 77 78 76 70 70 70 70 70 70 70 70 70 70	HZ DB 88 86 80 77 75 74 81 79 73 72 70 69 67 8000 66 HZ 69 67 8000 66 HZ 79 73 72 73 72 73 72 73 72 73 72 73 72 73 73 72 73 73 72 73 73 72 73 73 72 73 73 72 73 72 73 73 72 73 73 72 73 72 73 73 72 73 73 72 73
RPM 1200 1100 1000 900 800 700 6001200 6001200 6001100 900 800 700 600 900 800 700 600 800 700 600 800 700 800 700 800 700 800 700 800 800 1200 1100 900 800	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.46.8 51.5 561.1 409.0 287.3 192.4 409.0 287.3 192.4 For 1 5.1 10.1 10.1	POWER BHP 1.300 1.001 752 548 385 258 163 300 94 001 94 001 9548 385 258 Pressure ₁ 94 ENGINE 94 POWER 8HP 1.300 1.001 752 548 385 258 Pressure ₁ 848 385 258 Pressure ₁ 848 385 258 258 258 258 258 258 258 2	99 97 95 93 92 90 89 90 87 89 87 85 ta (OBGE) OVER 81 L DB(A) 92 90 89 87 85	HZ DB 105 103 101 100 98 97 99 97 95 93 92 Dist 89 HZ 89 HZ 89 HZ 99 97 95 93 92 Dist 89 97 95 93 92 Dist 89 97 95 93 92 Dist 89 97 95 93 92 Dist 89 97 95 93 92 Dist 89 97 95 93 92 Dist 89 97 95 93 92 Dist 89 97 95 93 92 Dist 89 97 95 93 92 Dist 89 97 95 93 92 Dist 89 97 95 93 92 Dist 89 97 95 93 92 Dist 89 97 95 93 92 Dist 93 93 92 Dist 93 93 93 93 92 Dist 93 93 93 93 93 93 93 93 93 93	HZ DB 100 98 94 92 91 88 86 84 83 ance32 250 80 PB 93 91 88 86 84 86 88 86 84	HZ DB 93 91 91 89 88 86 85 84 85 83 81 77 HZ 77 HZ 77 HZ 77 HZ 86 86 84 85 83 81	HZ DB 92 91 90 88 86 85 84 86 83 81 80 76 77 90 76 1000 75 HZ 75 DB 86 84 83 81 80	HZ DB 93 91 89 87 86 84 83 87 82 85 83 81 79 2 Feet) 2000 75 DB 87 85 83 81 79 78 2 South State Stat	HZ DB 93 91 84 82 81 79 78 86 77 78 76 78 76 74 73 72 70 4000 70 HZ 70 HZ 70 BB 86 84 78 76 74	HZ DB 88 86 80 78 77 75 81 73 72 73 72 73 72 70 69 67 8000 66 HZ 66 HZ 66 HZ 73 72 73 72 70 67
RPM 1200 1100 1000 900 800 700 6001200 6001200 6001100 5001100 900 800 700 60 EXH ENGINE SPEED RPM 1200 1100 1000 900	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.46.8 51.561.1 409.0 287.3 192.4 409.0 287.3 192.4 51.1 51.1 51.1 969.5 746.8 551.1 409.0	POWER BHP 1.300 1.001 752 548 385 258 163 300 163 300 94 001 94 001 94 001 9548 385 258 Pressure₁04 ENGINE 8HP 1.300 1.001 752 548	99 97 95 93 92 90 89 90 87 89 87 85 84 87 85 84 87 85 84 CVER 81 DE (A) 92 90 89 87	HZ DB 105 103 101 100 98 97 95 97 95 92 0 125 89 HZ 89 HZ 99 97 97 95 97 95 97 95 97 95 97 95 92 92 92 92 92 95 92 92 95 92 92 95 92 92 95 92 97 95 92 92 92 97 95 92 92 92 92 95 97 95 92 92 97 95 92 92 97 95 92 92 97 95 92 92 92 97 95 92 92 92 92 92 95 92 92 92 92 92 92 92 92 92 92	HZ DB 100 98 94 92 91 89 87 86 86 84 83 ance32 250 80 91 88 93 91 88 80 93 91 88 86 88 86	HZ DB 93 91 89 88 86 85 86 85 84 85 83 81 80 77 77 HZ 77 HZ 77 HZ 86 86 84 85 83	HZ DB 92 91 90 88 86 85 84 86 85 84 83 82 83 81 80 78 78 78 7749. DB 86 84 83 81	HZ DB 93 91 89 87 86 84 83 87 82 85 83 81 78 2000 75 HZ 75 HZ 75 HZ 85 83 81 81 83 81 81 78 83 81 81 83 81 81 81 83 81 83 81 83 81 81 83 81 83 81 83 81 81 83 81 83 81 81 81 83 81 83 81 83 81 81 83 81 81 81 81 81 85 83 81 83 81 81 81 81 81 81 81 81 81 81	HZ DB 93 91 84 82 81 79 78 86 74 76 74 73 72 4000 70 HZ DB 86 84 87 85 84 77 78 76 70 70 70 70 70 70 70 70 70 70	HZ DB 88 86 80 77 75 74 81 79 73 72 70 69 67 8000 66 HZ 69 67 8000 66 HZ 79 73 72 73 72 73 72 73 72 73 72 73 72 73 73 72 73 73 72 73 73 72 73 73 72 73 73 72 73 72 73 73 72 73 73 72 73 72 73 73 72 73 73 72 73
RPM 1200 1100 1000 900 800 700 6001200 5001100 900 800 700 6001200 800 700 60EXH ENGINE 500 RPM 1200 1100 1000 900 800 700	BKW 969.5 746.8 561.1 409.0 287.3 192.4 70.746.8 51.2 969.5 70.4 409.0 287.3 192.4 POWER POWER BKW 969.5 746.8 561.1 51.1 969.5 746.8 561.1 409.0 287.3 192.4	POWER BHP 1.300 1.001 752 548 385 258 163 300 94,001 1,000 1,001 7,52 548 385 258 84,001 548 385 258 84,001 752 548 385 258 85,005 258 85,005 85,0	99 97 95 93 92 90 89 92 88 90 87 85 87 85 0VER&1 L DB(A) 92 90 89 87 85 84	HZ DB 105 103 103 101 100 98 97 97 95 93 92 ↓ 125 89 HZ 89 HZ 89 HZ 93 97 97 95 93 92 93 92 93 92 93 92 93 92 93 92 93 92 93 92 93 92 93 92 93 92 93 92 93 93 92 93 93 92 93 93 92 93 93 93 93 95 95 95 95 95 95 95 95 95 95	HZ DB 100 98 92 91 88 87 86 84 83 ance32 250 80 HZ 93 91 88 86 84 83	HZ DB 93 91 91 89 88 86 85 86 85 84 85 83 81 80 77 77 HZ 77 HZ 77 HZ 86 86 84 85 83 81 80	HZ DB 92 90 88 86 85 84 86 83 84 80 78 rs (749. 1000 76 1000 76 1000 76 HZ 75 DB 86 84 83 81 80 78 78	HZ DB 93 91 89 87 86 84 83 87 82 85 81 79 78 2000 ⁷⁵ HZ 75 HZ 75 BB 87 85 83 81 79 78 87 85 83 81 79 78	HZ DB 93 91 84 82 81 77 86 78 86 77 84 76 74 73 70 4000 70 HZ 70 4000 70 HZ 70 50 70 70 70 70 70 70 70 70 70 70 70 70 70	HZ DB 88 86 80 77 75 81 74 81 73 72 70 69 67 8000 66 66 HZ DB 81 79 73 72 70 69 73 72 70 69 73 72 70 69

Perfor	mance Numbe	er: DM8714	Cha	ange Level:	01					
Sales Model: 3512200	969.5	1.300	101	97	Rated	Spee@D(F	PM) •951	200.96	93	96
Application: MARINE F		1,001	100	96					92	95
			110110 ⁹⁹	96		Powe ⁸⁹ (B	94 1	200 ⁹⁵	91	95
Rating Level: A RADNG				95		l Poweg (E			91	94
800	287.3	385	98	95	92	88	92	93	90	94
	NICAL Sopposed	Pressure ₁ Dat	ta (OBGF)	₽4 D⊒ist	91 ance	1 Meete	rs (⁹² ₉₁ 3.:	3 Feget)	90 89	93 92
	ENGINE 70.1	ENGINE 94	OVERALL	405 93	250 90	500 ⁸⁶	1000 ⁹¹	200091	4000 ⁸⁸	8000 ⁹²
SPEED	POWER 51.1	POWER 69	96	HZ ⁹²	HZ 90	нд ⁸⁵	HZ ⁹⁰	2000 нz ⁹¹	HZ ⁸⁸	HZ 91
RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
1200	969.5	1.300	101	97	94	90	95	96	93	96
1100	746.8	1.001	100	96	94	89	94	95	92	95
1000	561.1	752	99	96	93	89	94	95	91	95
900	409.0	548	99	95	92	88	93	94	91	94
800	287.3	385	98	95	92	88	92	93	90	94
700 600 ¹ 200	192.4 121.969.5	258 16 3 ,300	97 97 89	94 93 85	91 90 82	87 86 78	92 91 83	93 92 84	90 89 81	93 92 84
500 ¹²⁰⁰	70.746.8	<u>163</u> ,001	01		90 82 90 82	00	01	<u> </u>	00	52
4501000	51. 9 61.1	69 752	96 88 96 87	93 84 92 84	90 81 90 81	86 77 85 77	91 82 90 82	91 ⁸³ 91 83	88 80 88 80	92 83 91 83
900	409.0	548	87	83	80	76	81	82	79	82
800	287.3	385	86	83	80	76	81	81	78	82
	192.4	258	85	82	79	77 Mjejte	, 80	- ⁸¹	78	81
	NICAL Sound		ta (OBG5)		ance;				77	80
ENGINÊ ⁰⁰ SPEED	ENGINE 70.1 POWER 51.1	ENGINE 94 POWER 69	OVERALL	125 ⁸¹ HZ ⁸⁰	250 ⁷⁸ HZ ⁷⁸	500 ⁷⁴ HZ ⁷³	1000 ⁷⁹ 78	2000 ⁸⁰ HZ ⁷⁹	4000 ⁷⁶ НZ ⁷⁶	8000 ⁸⁰
JFEED	POWER	POWER		HZ **	HZ	HZ	HZ ^{′°}	HZ	HZ	HZ ^{/ 9}
	BKW	BHP	DB(A)	HZ DB	HZ DB	HZ DB	HZ DB	HZ DB	HZ DB	HZ DB
	BKW 969.5	BHP 1.300	89	DB 85	DB 82	DB 78	DB 83	DB 84	DB 81	DB 84
RPM 1200 1100	BKW 969.5 746.8	BHP 1.300 1,001	89 88	DB 85 84	DB 82 82	DB 78 77	DB 83 82	DB 84 83	DB 81 80	HZ DB 84 83
	BKW 969.5 746.8 561.1	BHP 1.300 1,001 752	89 88 87	DB 85 84 84	DB 82 82 81	DB 78 77 77	DB 83 82 82 82	DB 84 83 83	DB 81 80 80	HZ DB 84 83 83
RPM 1200 1100 1000 900	BKW 969.5 746.8 561.1 409.0	BHP 1.300 1.001 752 548	89 88 87 87	DB 85 84 84 84 83	DB 82 82 81 80	DB 78 77 77 76	DB 83 82 82 81	DB 84 83 83 82	DB 81 80 80 79	HZ DB 84 83 83 82
RPM 1200 1100 1000 900 800	BKW 969.5 746.8 561.1 409.0 287.3	BHP 1.300 1.001 752 548 385	89 88 87 87 87 86	DB 85 84 84 83 83	DB 82 82 81 80 80	DB 78 77 77 76 76 76	B3 83 82 82 81 81	DB 84 83 83 82 81	DB 81 80 80 79 78	HZ DB 84 83 83 82 82
RPM 1200 1100 1000 900 800 700	BKW 969.5 746.8 561.1 409.0 287.3 192.4	BHP 1.300 1.001 752 548 385 258	89 88 87 87 87 86 85	DB 85 84 83 83 83 82	DB 82 82 81 80 80 79	DB 78 77 77 76 76 76 75	B B B B B B B B B B B B C C C C C C C C C C C C C	DB 84 83 83 82 81 81	DB 81 80 80 79 78 78 78	HZ DB 84 83 83 82 82 82 81
RPM 1200 1100 900 800 700 6001200	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121. <u>2</u> 69.5	BHP 1.300 1.001 752 548 385 258 163,300	89 88 87 87 86 85 85 85 83	DB 85 84 83 83 83 82 81 79	DB 82 82 81 80 80 79 79 79 77	DB 78 77 77 76 76 76 75 74 72	DB 83 82 81 80 79	DB 84 83 83 82 81 81 80 78	DB 81 80 79 78 78 78 77 75	HZ DB 84 83 83 82 82 82 81 80 78
RPM 1200 1100 900 800 700 6001200 5001100	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121. <u>9</u> 69.5 70.746.8	BHP 1.300 1.001 752 548 385 258 163,300 94,001	89 88 87 87 86 85 85 85 83 84 82	DB 85 84 83 83 82 81 79 81 79 81 79	DB 82 82 81 80 80 79 79 79 77 78 76	DB 78 77 77 76 76 76 75 74 72 74 72	HZ DB 83 82 81 80 79 77 79	DB 84 83 83 82 81 81 80 78 80 78	DB 81 80 80 79 78 78 77 75 76 74	HZ DB 84 83 83 82 82 81 80 78 80 78
RPM 1200 1100 900 800 700 6001200	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121. <u>2</u> 69.5	BHP 1.300 1.001 752 548 385 258 163,300	89 88 87 87 86 85 85 85 83 84 82	DB 85 84 83 83 83 82 81 79	DB 82 82 81 80 80 79 79 79 77	DB 78 77 77 76 76 76 75 74 72	DB 83 82 81 80 79	DB 84 83 83 82 81 81 80 78	DB 81 80 79 78 78 78 77 75	HZ DB 84 83 83 82 82 82 81 80 78
RPM 1200 1100 900 800 700 6001200 5001100 4501000	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 51.561.1 409.0 287.3	BHP 1.300 1.001 752 548 385 258 163,300 94,001 69,752 548 385	89 88 87 87 86 85 85 85 84 82 84 82	DB 85 84 83 83 82 81 79 81 79 80 78	DB 82 82 81 80 80 79 79 79 77 78 76 78 76 75 75 75 74	DB 78 77 76 76 75 74 72 74 72 74 72 73 71 70 70	HZ DB 83 82 81 80 79 77 78	DB 84 83 83 82 81 81 80 78 80 78 79 77	DB 81 80 79 78 77 75 76 74 76 74 73 72	HZ DB 84 83 82 82 81 80 78 80 78 80 78 79 77 76 76
RPM 1200 1100 900 800 700 6001200 5001100 4501000 900 800 700	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 51.561.1 409.0	BHP 1.300 1.001 752 548 385 258 163,300 94,001 69752 548 385 258 258	89 88 87 87 86 85 85 85 83 84 82 84 82 84 82 84 82 84 80 80	DB 85 84 83 83 82 81 79 81 79 80 78 77 76	DB 82 81 80 80 79 79 79 77 78 76 78 75 75	DB 78 77 76 76 75 74 72 74 72 74 72 74 72 71 70	HZ DB 83 82 81 80 79 77 78 76 75 75 74	DB 84 83 83 82 81 81 80 78 80 78 80 78 79 77 76	DB 81 80 80 79 78 78 77 75 76 74 76 74 73	HZ DB 84 83 83 82 82 81 80 78 80 78 80 78 79 77 76
RPM 1200 1100 1000 900 800 700 6001200 5001100 4501000 900 800 700 MEGHAI	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 51.961.1 409.0 287.3 192.4 VICAL Sound	BHP 1.300 1.001 752 548 385 258 163.300 94.001 69 752 548 385 258 Pressure Pa	89 88 87 87 85 85 85 83 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 80 80 80 80 80 80 80 80 81 82 81 82 83 83 83 83 83 85 83 83 85 83 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 85 83 85 85 83 85 85 83 85 85 83 85 85 83 85 85 83 85 85 85 85 83 85 85 83 85 85 85 85 85 83 85 85 83 85 85 85 83 85 85 85 85 85 85 85 85 85 85 85 85 85	DB 85 84 83 83 82 81 79 81 79 80 78 77 76 76 55 425 75	DB 82 82 81 80 79 79 77 78 76 76 75 75 75 75 75 74 3 ance ₇ 3 325 72	DB 78 77 76 76 75 74 72 74 72 74 72 74 72 73 71 70 70 70 69 15 Meste	HZ DB 83 82 81 80 79 77 78 76 75 75 75 74 74 100073	DB 84 83 83 82 81 81 80 78 80 78 80 78 80 78 70 77 76 76 76 75 2 Fegt) 2000 ⁷⁴	DB 81 80 79 78 77 75 76 74 76 74 73 72 72 71 400071	HZ DB 84 83 82 82 81 80 78 80 78 80 78 79 77 76 76 75 75 800074
RPM 1200 1100 900 800 700 6001200 5001100 4501000 900 800 M66HAI ENGIN ^{E00}	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 51.561.1 409.0 287.3 192.4 NICAL Sound	BHP 1.300 1.001 752 548 385 258 163,300 94,001 69752 548 385 258 Pressure ₁ 93	89 88 87 87 86 85 85 85 83 84 82 84 82 84 82 84 82 84 80 80	DB 85 84 83 83 82 81 79 81 79 80 78 77 76 76 55 425 75	DB 82 82 81 80 79 79 77 78 76 76 75 75 75 75 75 74 3 ance ₇ 3 325 72	DB 78 77 76 76 75 74 72 74 72 74 72 74 72 73 71 70 70 70 69 15 Meste	HZ DB 83 82 81 80 79 77 78 76 75 75 75 74 74 100073	DB 84 83 83 82 81 81 80 78 80 78 80 78 80 78 70 77 76 76 76 75 2 Fegt) 2000 ⁷⁴	DB 81 80 79 78 77 75 76 74 76 74 73 72 72 71 400071	HZ DB 84 83 82 82 81 80 78 80 78 80 78 79 77 76 76 75 75 800074
RPM 1200 1100 1000 900 800 700 6001200 5001100 4501000 900 800 700 600 1200 5001400 5001400 900 800 700 800 8	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 51.561.1 409.0 287.3 192.4 VICAL Sound ENGINE 70.1 51.4 51.5 5	BHP 1.300 1.001 752 548 385 258 163.300 94.001 69752 548 385 Pressure 163 258 Pressure 193 ENGINE 94	89 88 87 87 85 85 85 83 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 80 80 80 80 80 80 80 80 81 82 81 82 83 83 83 83 83 85 83 83 85 83 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 85 83 85 85 83 85 85 83 85 85 83 85 85 83 85 85 83 85 85 85 85 83 85 85 83 85 85 85 85 85 83 85 85 83 85 85 85 83 85 85 85 85 85 85 85 85 85 85 85 85 85	DB 85 84 83 83 83 82 81 79 81 79 80 78 77 76 76 76 76 76	DB 82 82 81 80 79 79 77 78 76 78 75 75 74 73 ance ³ 3	DB 78 77 76 76 75 74 72 74 72 74 72 74 72 73 71 70 70 69 9 15 Meste	HZ DB 83 82 81 80 79 77 78 75 75 74 74	DB 84 83 83 82 81 81 80 78 80 78 80 78 70 77 76 76 76 75 2 Feg1)	DB 81 80 79 78 77 75 76 74 76 74 73 72 72 71	HZ DB 84 83 83 82 82 81 80 78 80 78 80 78 79 77 76 76 75 75
RPM 1200 1100 1000 900 800 700 600 ¹ 200 500 ¹ 200 500 ¹ 100 450 ¹ 000 900 800 700 MEGHAI ENGINE ⁰⁰⁰ SPEED	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 51.961.1 409.0 287.3 192.4 NICAL Source FILL FOLL 51.1 51.1	BHP 1.300 1.001 752 548 385 258 163.300 94.001 69 752 548 385 Pressure 193 ENGINE 94 POWER 94	89 88 87 87 85 85 85 85 83 84 82 84 82 84 82 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 80 81 81 81 81 81 82 81 81 82 81 81 82 81 81 82 81 81 82 81 82 81 82 81 82 81 82 83 82 83 83 83 82 83 83 82 83 83 83 83 84 82 84 82 83 83 84 82 84 82 84 82 83 83 84 82 84 82 84 82 83 83 84 82 84 82 84 82 83 84 82 84 82 83 83 84 82 84 82 84 82 84 82 83 83 84 82 84 82 84 82 84 82 83 83 84 82 84 82 84 82 83 83 83 84 82 83 83 83 84 82 84 82 84 82 84 82 83 83 84 82 84 82 84 82 84 82 83 83 84 82 84 82 84 82 83 83 83 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 84 82 84 84 82 84 84 82 84 84 84 84 84 80 84 80 84 80 84 80 84 80 80 80 80 80 80 80 80 80 80 80 80 80	DB 85 84 83 83 82 81 79 81 79 80 78 77 76 Pist 125 75 HZ 75	DB 82 82 81 80 79 79 77 78 76 75 74 73 ance;3 250 72 HZ	DB 78 77 77 76 76 75 74 72 74 72 74 72 74 72 74 70 70 69 15 Negte 500 68 HZ	HZ DB 83 82 81 80 79 77 78 76 75 76 75 75 75 75 75 75 73	DB 84 83 83 82 81 80 78 80 78 80 78 76 76 76 76 76 76 76 76 76 76	DB 81 80 80 79 78 77 75 76 74 73 72 72 71 4000 71 HZ	HZ DB 84 83 82 82 81 80 78 80 78 79 77 76 76 76 75 75 8000 ⁷⁴ HZ
RPM 1200 1100 1000 900 800 700 600 ¹ 200 500 ¹ 100 450 ¹ 000 900 800 MEGHAI ENGINÉ ⁰⁰ SPEED	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 51.561.1 409.0 287.3 192.4 VICAL South 1924 NICAL South 1924 BKW 969.5 746.8	BHP 1.300 1.001 752 548 385 258 163,300 94,001 69752 548 385 258 Pressure 258 Pressure 94 POWER 94 POWER 94 1.300 1.001	89 88 87 87 86 85 85 83 84 82 84 82 84 81 80 0VERA 80 0VERA 78 DB(A) 83 82	DB 85 84 83 83 82 81 79 81 79 80 78 77 76 5 125 75 HZ 75 HZ 79 79 79 79 79	DB 82 82 81 80 79 79 77 78 76 78 76 75 74 75 75 74 75 75 75 75 75 72 HZ 250 72 HZ 77 77 77 75 75 75 75 75 75 75	DB 78 77 76 76 75 74 72 74 72 73 71 70 69 15 Mete 500 68 HZ 500 68 HZ 72 72 72 72	TZ DB 83 82 81 80 79 77 78 76 75 75 75 75 75 76 73 1000 73 DB 77 77 77	DB 84 83 83 82 81 80 78 80 78 79 77 76 76 75 2000 ⁷⁴ HZ 78 78 78 78 78 78 78 78	DB 81 80 80 79 78 77 75 76 74 73 72 71 4000 71 HZ 70 DB 75 74	HZ DB 84 83 83 82 82 81 80 78 80 78 79 77 76 76 76 76 75 75 8000 74 HZ 74 DB 78 78
RPM 1200 1100 1000 900 800 700 6001200 5001100 900 800 700 6001200 5001100 900 800 700 600 900 800 700 800 700 800 700 800 700 800 800 700 800 700 800 700 800 700 800 800 700 800 700 800 800 800 800 800 800 800 800 800 800<	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 51.561.1 409.0 287.3 192.4 192.4 409.0 287.3 192.4 192.4 409.0 287.3 192.4 192.4 51.1 51.1 969.5 746.8 561.1	BHP 1.300 1.001 752 548 385 258 163,300 94,001 69752 548 385 258 Pressure Paressure 1931 ENGINE 94 94 94 94 94 94 94 94 94 94	89 88 87 87 86 85 85 83 84 82 84 82 84 81 80 0VERA 80 0VERA 78 DB(A) 82 82	DB 85 84 83 83 82 81 79 81 79 80 78 77 76 95 125 75 HZ 75 HZ 79 79 79 79 79 75 79 79 79 75 79 79 79 79 75 79 79 79 79 79 77 76 77 77 76 77 76 75 79 79 79 75 79 79 79 77 76 77 76 77 76 77 77 76 77 77	DB 82 82 81 80 79 79 77 78 76 75 74 73 250 72 72 72 72 72 72 72 72 72 72	DB 78 77 76 76 75 74 72 74 72 74 70 70 70 70 70 70 70 70 68 HZ 68 HZ 68 HZ 72 72 71	HZ DB 83 82 81 80 79 77 78 76 75 75 75 74 73 1000 73 DB 77 76 77 76	DB 84 83 83 82 81 80 78 79 77 76 76 75 76 75 2000 ⁷⁴ HZ 78 78 77 78 77	DB 81 80 79 78 78 77 75 76 74 73 72 72 72 71 4000 71 HZ 70 BB 75 74 74 74	HZ DB 84 83 82 81 80 78 76 75 8000 74 DB 78 77 78 77
RPM 1200 1100 1000 900 800 700 6001200 5001100 4501000 900 800 700 6001200 5001100 900 800 700 800 700 800 700 800 700 800 700 800	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.909.5 70.746.8 51.961.1 409.0 287.3 192.4 192.4 90.5 70.1 51.1 969.5 746.8 561.1 409.0	BHP 1.300 1.001 752 548 385 258 163,300 94,001 69 752 548 385 258 Pressure Paresure Paresure 94 POWER 94 POWER 94 94 94 94 POWER 8HP 1.300 1.001 1.001 1.001 1.001 1.001	89 88 87 87 86 85 85 85 82 84 82 84 82 81 0VERA 78 DB(A) 83 82 82 81	DB 85 84 83 83 82 81 79 81 79 80 78 77 76 55 HZ 75 HZ 79 79 79 79 78 77 77 76 55 125 75 HZ 79 78 79 79 78 79 79 78 79 78 79 75 79 78 79 79 75 79 79 79 78 79 75 77 75 77 75 77 75 77 75 77 75 77 75 77 75 77 75 75	DB 82 82 81 80 80 79 79 77 76 75 75 74 73 76 72 HZ 250 72 HZ 75 75 75 75	DB 78 77 76 76 75 74 72 74 72 73 71 70 15 M 6 6 8 HZ 68 HZ 72 72 72 71 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 70 1 1 70 1 1 70 1 1 70 1 1 70 1 1 70 1 1 1 1 1 1 1 1	HZ DB 83 82 81 80 79 79 77 76 75 74 7000 73 HZ 73 DB 77 76 75 73 HZ 73 DB 77 76 75	DB 84 83 83 82 81 80 78 79 77 76 2000 ⁷⁴ HZ 78 78 78 78 77 76	DB 81 80 80 79 78 78 77 75 76 74 76 74 72 72 71 4000 71 HZ 70 DB 75 74 75 74 73 75 74 72 72 71 72 72 72 72 73 75 74 74 73 75 74 73 75 74 75 74 74 75 74 75 74 75 74 75 74 75 74 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 75 74 75 75 75 74 75 75 74 75 75 75 74 75 75 75 74 75 75 75 74 75 75 75 75 74 75 75 75 76 74 70 72 72 71 70 70 72 72 70 70 70 70 70 72 70 70 70 70 70 72 70 70 70 70 70 70 70 70 70 70	HZ DB 84 83 82 81 80 78 709 76 76 75 800074 HZ 78 78 77 76
RPM 1200 1100 1000 900 800 700 6001200 5001100 4501000 900 800 700 6001200 5001100 4501000 900 800 700 900 800 700 900 800 1200 1100 1000 900 800	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 51.961.1 409.0 287.3 192.4 121.969.5 70.746.8 51.1 51.1 969.5 746.8 561.1 409.0 287.3	BHP 1.300 1.001 752 548 385 258 163.300 94.001 69 752 548 385 Pressure Paresure BHP 1.300 1.001 752 548 385 258 Pressure 193 1.001 1	89 88 87 87 85 85 85 85 85 82 84 82 84 82 84 80 0VERA[8] 78 DB(A) 83 82 81 80	DB 85 84 83 83 82 81 79 80 78 77 76 80 75 HZ 75 HZ 75 HZ 75 75 75 75 75 75 75 75 75 75	DB 82 82 81 80 79 79 77 78 76 75 74 73 250 72 HZ 75 75 75 75 75 75 75 75 75 75	DB 78 77 76 76 75 74 72 74 72 74 70 70 69 15 Mete 500 68 HZ 72 72 72 72 72 71 70 70 70 70 70 70 70 70 70 70	HZ DB 83 82 81 80 79 79 78 76 75 75 75 75 76 73 DB 77 76 75 75 77 76 75 75 75 75 75 75	DB 84 83 83 82 81 80 78 79 77 76 76 76 76 76 76 76 76 76	DB 81 80 79 78 77 75 76 74 70 72 71 4000 71 HZ 70 HZ 75 74 74 73 72 73 72 71 4000 71 75 74 75 74 75 74 72 71 75 76 74 72 72 71 75 76 74 73 72 72 71 75 76 74 73 72 72 71 72 72 72 71 73 72 72 71 75 74 75 74 75 76 74 72 72 71 75 76 74 72 72 71 75 76 74 72 72 71 75 76 74 72 72 71 75 76 74 72 72 71 75 76 74 70 72 72 71 72 72 71 72 72 71 72 72 71 72 72 71 73 72 73 72 72 71 73 72 73 72 73 72 72 71 73 72 73 72 73 72 73 72 73 72 73 72 73 73 72 73 73 72 73 73 73 73 75 74 75 74 75 74 75 74 75 74 75 74 73 75 74 73 75 74 73 73 73 73 73 73 73 73 73 73	HZ DB 84 83 82 82 81 80 78 80 78 79 77 76 76 75 75 8000 74 HZ 74 HZ 78 78 78 78 78 77 76 76 76 76
RPM 1200 1100 1000 900 800 700 6001200 5001100 4501000 900 800 700 ME5GHAI ENGINÉ ²⁰⁰ SPEED RPM 1200 1100 900 800 700	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 51.561.1 409.0 287.3 192.4 NICAL Sound POWER FI.1 POWER 51.1 BKW 969.5 746.8 561.1 409.0 287.3 192.4	BHP 1.300 1.001 752 548 385 258 163,300 94,001 69752 548 385 Pressure ₁ 93 ENGINE 94 POWER BHP 1.300 1.001 752 548 385 258	89 88 87 87 86 85 85 83 84 82 84 82 84 82 84 80 OVERA 78 DB(A) 83 82 81 80 80 80 80 80 80 80 80 80 80	DB 85 84 83 83 82 81 79 81 79 80 78 77 76 Pist 125 75 HZ 75 HZ 75 75 75 75 75 75 75 75 75 75	DB 82 81 80 79 79 77 78 76 75 74 77 76 75 74 75 74 75 75 74 75 75 74 77 76 75 77 76 72 HZ 77 76 77 73 73 74 73 75 74 73 75 74 73 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 72 72 72 72 72 72 72 72 72 72	DB 78 77 76 76 75 74 72 74 72 73 70 70 69 15 Meter 500 68 HZ 72 72 72 72 71 70 70 69 15 70 70 70 70 70 70 70 70 70 70	HZ DB 83 82 81 80 79 76 75 75 76 75 77 1000 73 HZ 73 DB 77 76 73 HZ 73 DB 77 76 75 75 75 74 73 DB 77 76 75 75 75 75 75 74	DB 84 83 83 82 81 80 78 76 76 76 76 76 76 76 76 77 76 76	DB 81 80 80 79 78 78 77 75 74 70 72 71 4000 71 HZ 70 DB 75 74 74 73 72 72 72 71 72 72 72 72 72 72 73 72 72 72 72 72 72 72 72 72 72	HZ DB 84 83 82 81 80 78 79 76 75 75 8000 74 DB 78 76 76 75 76 75 76 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 76 76 76 76 76 76 76 76 76 76 76 75 75
RPM 1200 1100 1000 900 800 700 6001200 5001100 4501000 900 800 700 ME5GHAI ENGINÉ00 SPEED RPM 1200 1100 900 800 700 600	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.269.5 70.746.8 51.561.1 409.0 287.3 192.4 NICAL Seynga ENGINE 70.1 POWER 70.1 51.1 BKW 969.5 746.8 561.1 409.0 287.3 192.4 192.4 192.4 192.4 192.4 192.4 192.4	BHP 1.300 1.001 752 548 385 258 163,300 94,001 69752 548 385 258 Pressure₁93 ENGINE 94 POWER 94 POWER 8HP 1.300 1.001 752 548 385 258 1.63	89 88 87 87 86 85 85 83 84 82 84 82 84 81 80 OVERATE 78 DB(A) 83 82 82 81 80 80 78 DB(A) 83 82 82 81 80 80 78 78 78 78 78 78 78 78 78 78	DB 85 84 83 83 83 82 81 79 81 79 80 78 77 76 DB 79 79 79 79 79 79 79 79 79 77 76 77 75 DB 75 75 75 75 75 75 75 77 76 77 77 76 77 77 76 77 77	DB 82 82 81 80 79 79 77 78 76 75 74 73 250 72 HZ 72 DB 77 76 75 75 74 72 72 72 72 72 73 73 73	DB 78 77 76 76 75 74 72 74 72 74 70 70 69 15 Mete 500 68 HZ 72 72 72 71 70 70 69 15 10 70 70 69 10 70 70 70 70 70 70 70 70 70 7	HZ DB 83 82 81 80 79 77 78 76 75 75 76 73 1000 73 76 75 76 75 77 76 75 75 74 73	DB 84 83 83 82 81 80 78 76 76 76 76 76 76 76 76 76 75 74 10 10 10 10 10 10 10 10 10 10	DB 81 80 80 79 78 77 75 76 74 72 72 71 4000 71 4200 71 4200 71 72 72 71 72 72 73 72 72 71 73 72 72 71 73 72 72 71 73 72 72 71 73 72 72 71 73 72 72 71 73 72 72 71 73 72 72 72 71 72 72 71 72 72 71 72 72 72 72 71 72 72 72 72 72 72 72 72 72 72	HZ DB 84 83 82 81 80 78 79 76 75 75 8000 74 DB 78 77 76 75 75 75 75 75 76 75 76 75 76 75 77 76 77 76 77 76 77 76 77 76 75 75 75 75 75 75 75 75 75 75 75 75 75
RPM 1200 1100 1000 900 800 700 6001200 5001100 4501000 900 800 700 ME5GHAI ENGINÉ ²⁰⁰ SPEED RPM 1200 1100 900 800 700	BKW 969.5 746.8 561.1 409.0 287.3 192.4 121.969.5 70.746.8 51.561.1 409.0 287.3 192.4 NICAL Sound POWER FI.1 POWER 51.1 BKW 969.5 746.8 561.1 409.0 287.3 192.4	BHP 1.300 1.001 752 548 385 258 163,300 94,001 69752 548 385 Pressure ₁ 93 ENGINE 94 POWER BHP 1.300 1.001 752 548 385 258	89 88 87 87 86 85 85 83 84 82 84 82 84 82 84 80 OVERA 78 DB(A) 83 82 81 80 80 80 80 80 80 80 80 80 80	DB 85 84 83 83 82 81 79 81 79 80 78 77 76 Pist 125 75 HZ 75 HZ 75 75 75 75 75 75 75 75 75 75	DB 82 81 80 79 79 77 78 76 75 74 77 76 75 74 75 74 75 75 74 75 75 74 77 76 75 77 76 72 HZ 77 76 77 73 73 74 73 75 74 73 75 74 73 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 72 72 72 72 72 72 72 72 72 72	DB 78 77 76 76 75 74 72 74 72 73 70 70 69 15 Meter 500 68 HZ 72 72 72 72 71 70 70 69 15 70 70 70 70 70 70 70 70 70 70	HZ DB 83 82 81 80 79 76 75 75 76 75 76 75 74 900 73 HZ 73 DB 77 76 75 75 77 76 75 75 75 77 76 75 75 75 74	DB 84 83 83 82 81 80 78 76 76 76 76 76 76 76 76 77 76 76	DB 81 80 80 79 78 78 77 75 74 70 72 71 4000 71 HZ 70 DB 75 74 74 73 72 72 72 71 72 72 72 72 72 72 73 72 72 72 72 72 72 72 72 72 72	HZ DB 84 83 82 81 80 78 79 76 75 75 8000 74 DB 78 76 76 75 76 75 76 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 77 76 76 76 76 76 76 76 76 76 76 76 76 75 75

Perfor	mance Numbe	er: DM8730	Cha	ange Level:	01					
Sales Model: 3512200	1,118.5	1,500	113	118	Rated	∣Speé@©(F	RPM)1051	200 108	106	104
Application: MARINE P	ROPUL รใช้เพิ่	1,155	111	116	Rated	Power3(E	KW) ¹⁰³ 1	118 106	104	102
Rating Level: A Red NG				113					98	94
Rating Level. A Region 8	331.4	444	106	112 110	104	l Powrenz (l 100	י 101 קרות ב 99	,500 104 102	97 95	92 90
700	222.0	298	108	108	104	98	99 97	102	93	90 89
60 ÆXH	AUST Sound	Pressure	ta (OBC)		anceol	1.5 Mjęte	rs (₉₆ 4.9	9 Fegeti)	92	87
$ENGIN_{450}^{500}$	ENGINE 80.9	ENGINE 109	OVERALL	125 106	250 ¹⁰⁰ ₉₉	500 96 95	1000 ⁹⁵ 94	2000 ⁹⁸ 97	4000 91	8000 ⁸⁶
SPEED	POWER 59.0	POWER 79	101	HZ 105	230 ₉₉ нz	HZ 95	HZ ⁹⁴	HZ 97	HZ 90	HZ 86
RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
1200	1.118.5	1.500	113	118	113	106	105	108	106	104
1100	861.5	1,155	111	116	111	104	103	106	104	102
1000	647.3	868	109	113	107	103	102	105	98 07	94
900 800	471.9 331.4	633 444	108 106	112 110	106 104	102 100	101 99	104 102	97 95	92 90
700	222.0	000	104	100	100	98	99 97	102	93	90 89
con1200	12h 118.5	4 0 1 2 500	102100	$t_{0} = 106$	404 101	₉₇ 94	96 ⁹⁴	₉₉ 94	92 94	87 ⁸⁹
_{E00} 1100	80 801.5	106 155	102 ⁹⁰	100 104	100 99	96 92	95 ⁹²	98 ⁹²	91 92	86 87
4501000	59.647.3	79 ⁸⁶⁸	101 90	105 104	99 95	₉₅ 92	94 90	₉₇ 90	90 85	86 ⁸¹
900	471.9	633	94	102	93	90	89	88	83	79
800 700	331.4 222.0	444 298	93 91	101 99	92 90	89 87	87 85	87 85	82 80	77 76
60 /EXH	AUST Sound	Pressure Dat			ances	7 Maete	rs (82,23.		79	70
	80.9	100				500 ⁸⁴ 84			4000,77	8000 ⁷³
500 ENGIN <u>550</u> SPEED	ENGINE 59.0	ENGINE 79	OVERÅ	125 ⁹⁶ 96	250 ⁸⁷ HZ	500 ₈₄	1000 ⁸³ 82	2000 82	//	800073
JF LLD	POWER	POWER		HZ	HZ	HZຶ່	HZ	HZ	HZ	HZ
RPM	BKW	BHP	DB(A)	HZ DB	DB	HZ DB	HZ DB	HZ DB	HZ DB	HZ DB
	BKW 1.118.5	BHP 1.500	100	DB 106	DB 101	HZ DB 94	HZ DB 94	HZ DB 94	HZ DB 94	HZ DB 89
RPM 1200 1100	BKW 1.118.5 861.5	BHP 1.500 1,155	100 98	HZ DB 106 104	DB 101 99	HZ DB 94 92	HZ DB 94 92	HZ DB 94 92	HZ DB 94 92	HZ DB 89 87
RPM 1200 1100 1000	BKW 1.118.5 861.5 647.3	BHP 1.500 1,155 868	100 98 96	HZ DB 106 104 104	DB 101 99 95	HZ DB 94 92 92	HZ DB 94 92 90	HZ DB 94 92 90	HZ DB 94 92 85	HZ DB 89 87 81
RPM 1200 1100 1000 900	BKW 1.118.5 861.5 647.3 471.9	BHP 1.500 1.155 868 633	100 98 96 94	HZ DB 106 104 104 104 102	DB 101 99 95 93	HZ DB 94 92 92 90	HZ DB 94 92 90 89	HZ DB 94 92 90 88	HZ DB 94 92 85 83	HZ DB 89 87 81 79
RPM 1200 1100 1000 900 800 700	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0	BHP 1.500 1.155 868 633 444	100 98 96 94 93	HZ DB 106 104 104 102 101	DB 101 99 95 93 92	HZ DB 94 92 92 90 89 87	HZ DB 94 92 90 89 87 85	HZ DB 94 92 90 88 87	HZ DB 94 92 85 83 82	HZ DB 89 87 81 79 77
RPM 1200 1100 1000 900 800 700 6001200	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 12b b18.5	BHP 1.500 1.155 868 633 444 298 495500	100 98 96 94 93 91 90 93	HZ DB 106 104 104 102 101 99 98 100	DB 101 99 95 93 92 90 90 94	HZ DB 94 92 92 90 89 87 86 87	HZ DB 94 92 90 89 87 85 84 87	HZ DB 94 92 90 88 87 85 84 88	HZ DB 94 92 85 83 82 80 79 87	HZ DB 89 87 81 79 77 76 76 74 82
RPM 1200 1100 900 800 700 600 ¹ 200 500 ¹ 100	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 12b b18.5	BHP 1.500 1.155 868 633 444 298 187 500 105 155	100 98 96 94 93 91 90 93 88 91	HZ DB 106 104 104 102 101 99 98 100 96 98	DB 101 99 95 93 92 90 89 94 87 92	HZ DB 94 92 92 90 89 87 86 87 86 87 84 85	HZ DB 94 92 90 89 87 85 84 87 84 83 85	HZ DB 94 92 90 88 87 85 85 84 88 84 88 82 86	HZ DB 94 92 85 83 82 80 79 87 77 85	HZ DB 89 87 81 79 77 76 82 74 82 73 80
RPM 1200 1100 900 800 700 600 ¹ 200 500 ¹ 100 450 ¹ 000	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.518.5 80.661.5 59.647.3	BHP 1.500 1.155 868 633 444 298 187 500 109 155 79 868	100 98 96 94 93 91 90 93 88 91 88 89	HZ DB 106 104 102 101 99 98 100 98 100 96 98 96 97	DB 101 99 95 93 92 90 90 89 94 87 92 87 88	HZ DB 94 92 90 89 87 86 87 86 85 84 85	HZ DB 94 92 90 89 87 85 85 85 85 83 85 83 85 83 85 82 84	HZ DB 94 92 90 88 87 85 85 84 88 82 86 82 83	HZ DB 94 92 85 83 82 80 79 87 77 85 77 78	HZ DB 89 87 81 79 77 76 74 82 73 80 73 74
RPM 1200 1100 900 800 700 600 ¹ 200 600 ¹ 100 500 ¹ 100 450 ¹ 000 900	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.818.5 80.815 59.647.3 59.647.3 471.9	BHP 1.500 1.155 868 633 444 298 187 500 187 500 109 155 109 155 79 868 79 863 633	100 98 96 94 93 91 90 93 88 91 88 89 88 89 88	HZ DB 106 104 102 101 99 98 100 98 96 98 97 96 97 96	DB 101 99 95 93 92 90 89 90 89 94 87 92 87 88 87	HZ DB 94 92 92 90 89 87 86 87 86 87 84 85 84 85 84	H2 DB 94 92 90 89 87 85 84 87 83 85 83 85 83 84 82 84 82	HZ DB 94 92 90 88 87 85 85 84 88 82 86 82 83 82 82	HZ DB 94 92 85 83 82 80 79 87 79 85 77 78 77 78 77	HZ DB 89 87 81 79 77 76 82 74 80 73 80 73 74 72
RPM 1200 1100 1000 900 800 700 600 ¹ 200 600 ¹ 200 500 ¹ 100 500 ¹ 100 450 ¹ 000 900 800	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.818.5 80.9617.3 59.647.3 59.647.3 331.4	BHP 1.500 1.155 868 633 444 298 500 187 500 109 155 79 868 633 444	100 98 96 94 93 91 90 93 88 91 90 93 88 89 88 89 88 88 88 88	HZ DB 106 104 102 101 99 98 100 98 98 96 97 96 97 96 94	DB 101 99 95 93 92 90 89 90 87 92 87 88 87 85	HZ DB 94 92 92 90 89 87 86 87 86 87 84 85 84 85 84 82	HZ DB 94 90 89 87 85 84 85 83 85 84 85 83 84 82 80 79	HZ DB 94 90 88 87 85 84 88 86 82 83 82 83 82 80 78	HZ DB 94 92 85 83 82 80 79 85 77 85 77 78 77 75	HZ DB 89 87 81 79 77 76 82 73 80 73 74 73 74 72 71
RPM 1200 1100 900 800 700 600 ¹ 200 600 ¹ 200 500 ¹ 100 500 ¹ 100 450 ¹ 000 900 800 700	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.818.5 80.815 59.647.3 59.647.3 471.9	BHP 1.500 1.155 868 633 444 298 187500 109155 109155 79868 633 444 298	100 98 96 94 93 91 93 90 93 90 93 88 91 88 89 88 88 88 88 88 84	HZ DB 106 104 104 102 101 99 98 90 98 98 96 97 96 97 96 94 92	DB 101 99 95 93 92 90 89 90 89 94 87 92 87 88 87	HZ DB 94 92 92 90 89 87 86 87 86 87 84 85 84 85 84	H2 DB 94 90 89 87 85 84 85 83 85 84 85 83 84 82 84 82 80 79	HZ DB 94 92 90 88 87 85 85 84 88 82 86 82 83 82 82	HZ DB 94 92 85 83 82 80 79 87 79 85 77 78 77 78 77	HZ DB 89 87 81 79 77 76 82 74 80 73 80 73 74 72
RPM 1200 1100 1000 900 800 700 600 ¹ 200 600 ¹ 200 500 ¹ 100 500 ¹ 100 450 ¹ 000 900 800 700 60 / EXH	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.818.5 80.961.5 59.647.3 471.9 331.4 222.0 AUST Sound 80.9	BHP 1.500 1.155 868 633 444 298 109 155 79 868 633 444 298 633 444 298 109 Pressure D	100 98 96 94 93 90 93 88 91 88 89 88 88 88 86 84 ta (OBGF)	HZ DB 106 104 104 102 101 99 98 90 98 98 96 97 96 97 96 94 92 Gist	DB 101 99 95 93 92 90 89 94 89 94 87 87 88 87 85 83 ances2	HZ DB 94 92 90 89 87 86 87 87 86 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 86 87 87 87 86 87 87 87 87 87 87 87 87 87 87 87 87 87	HZ DB 94 90 89 87 85 84 87 85 83 85 83 85 84 82 84 82 80 79 rs (7 49 .	HZ DB 94 90 88 87 85 84 88 82 83 82 83 82 83 82 80 78 2 Feqt)	HZ DB 94 85 83 82 80 79 87 77 85 77 85 77 78 77 75 73 72	HZ DB 89 87 81 79 77 76 82 73 80 73 74 73 74 73 74 73 74 69 68
RPM 1200 1100 900 800 700 600 ¹ 200 600 ¹ 200 500 ¹ 100 500 ¹ 100 450 ¹ 000 900 800 700	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.818.5 80.861.5 59.647.3 471.9 331.4 222.0 AUST Sound	BHP 1.500 1.155 868 633 444 298 187500 187500 109155 79868 633 444 298 Pressure	100 98 96 94 93 91 93 90 93 90 93 88 91 88 89 88 88 88 88 88 84	HZ DB 106 104 104 102 101 99 98 90 98 98 96 97 96 97 96 94 92	DB 101 99 95 93 92 90 89 94 87 92 87 88 87 87 85 83	HZ DB 94 92 90 89 87 86 87 86 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 85 84 85 85 85 85 85 85 85 85 85 85 85 85 85	H2 DB 94 90 89 87 85 84 85 83 85 84 85 83 84 82 84 82 80 79	HZ DB 94 90 88 87 85 84 88 86 82 83 82 83 82 80 78	HZ DB 94 92 85 83 82 80 87 79 85 77 75 75 73	HZ DB 89 87 81 79 77 76 82 73 80 73 74 73 74 72 71 69
RPM 1200 1100 1000 900 800 700 600 ¹ 200 500 ¹ 100 450 ¹ 000 900 800 700 60EXH ENGIN ⁵⁰⁰ SPEED	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.818.5 80.9617.3 59.647.3 471.9 331.4 222.0 AUST Sound ENGINE 80.9 59.0 POWER BKW	BHP 1.500 1.155 868 633 444 298 187 500 109 155 79 868 633 444 298 79 868 633 444 298 Pressure ₽109 79 809 807 79 809 807 79 809 807 809 79 809 807 809 809 809 809 809 809 809 809	100 98 96 94 93 90 93 88 91 88 89 88 88 86 ta (OBGF) OVER 81 OVER 81 DB(A)	HZ DB 106 104 102 101 99 98 98 98 98 98 98 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 90 B L25 89 HZ DB	DB 101 99 95 92 90 99 89 94 87 87 87 87 87 87 87 83 anceg2 250 80 HZ	HZ DB 94 92 90 89 87 86 87 86 87 86 87 84 85 84 85 84 85 84 82 80 15 Mete 500 78 77 HZ	HZ DB 94 92 90 89 87 85 84 85 83 84 85 83 84 85 82 80 79 rs (7 49 . 1000 ⁷⁶ HZ	HZ DB 94 92 90 88 87 85 84 88 82 83 82 80 78 82 80 78 82 80 78 82 80 78 90 76 HZ 75 DB	HZ DB 94 92 85 83 82 80 79 87 77 85 77 85 77 85 77 75 73 72 75 73 72 400071 HZ 70 HZ	HZ DB 89 87 81 79 77 76 82 73 80 73 74 73 72 71 69 68 68 66 HZ DB
RPM 1200 1100 1000 900 800 700 600 ¹ 200 500 ¹ 100 450 ¹ 900 800 700 600EXH ENGIN ⁵⁰⁰ SPEED RPM 1200	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.818.5 80.815.5 59.647.3 471.9 331.4 222.0 AUST Sound ENGINE 80.9 POWER 80.9 POWER 80.9 BKW 1.118.5	BHP 1.500 1.155 868 633 444 298 187 500 198 633 444 298 BHP 1.55 509 109 155 79 868 633 444 298 187 500 199 155 79 868 633 444 298 199 157 79 868 633 444 298 BHP	100 98 96 94 93 91 90 93 88 89 88 88 86 88 86 ta (OBGF) OVER 87 L DB(A) 93	HZ DB 106 104 104 102 101 99 98 98 98 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 94 92 JIST 125 89 HZ 89 HZ 100 100 100 100 100 100 100 100 100 10	DB 101 99 95 92 90 89 92 87 88 87 85 83 87 85 83 81 42 0B 94 94	HZ DB 94 92 90 89 87 86 87 86 87 87 86 87 87 87 87 87 87 87 80 78 77 HZ DB 87	H2 DB 94 92 90 89 87 85 84 87 85 83 84 85 83 84 82 80 79 rs (7 49 . 90 80 79 79 rs (7 49 .	HZ DB 94 90 88 87 85 84 88 82 83 82 83 82 83 82 80 78 2 78 2 78 2 000 ⁷⁶ HZ 75 DB 88	HZ DB 94 92 85 83 82 80 79 87 77 85 77 78 85 77 75 73 72 75 73 72 4000 71 HZ 70 HZ	HZ DB 89 87 81 79 77 76 82 73 80 73 74 73 74 73 74 73 74 73 74 73 74 69 68 800 67 HZ BB 82
RPM 1200 1100 1000 900 800 700 600 ¹ 200 500 ¹ 100 450 ¹ 000 900 800 700 60 EXH 505 SPEED RPM 1200 1100	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.88.5 80.861.5 59.47.3 471.9 331.4 222.0 AUST Soyund ENGINE 80.9 59.0 POWER 80.9 59.0 POWER 50.0 BKW 1.118.5 861.5	BHP 1.500 1.155 868 633 444 298 187 ⁵⁰⁰ 187 ⁵⁰⁰ 187 ⁵⁰⁰ 187 ⁵⁰⁰ 109 79 ⁸³⁸ 444 298 Pressur⊧ 9633 444 298 Pressur⊧ 979 909 109 79 909 109 109 109 109 109 109 10	100 98 96 94 93 91 93 90 93 88 89 88 89 88 88 86 84 ta (OBGF) OVER81 UB(A) 93 91	HZ DB 106 104 102 101 99 98 90 98 98 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 94 92 91st 125 89 HZ DB 100 98	DB 101 99 95 93 92 90 94 87 85 83 87 85 83 87 85 83 81 HZ DB 94 92	HZ DB 94 92 90 89 87 86 85 84 85 84 85 84 85 84 85 80 78 77 HZ DB 87 85	H2 DB 94 90 89 87 85 84 85 83 84 85 83 84 85 87 rs (7 49. 76 100076 H2 76 H2 76 87 85	HZ DB 94 90 88 87 85 84 82 83 82 83 82 83 82 83 82 80 78 2000 76 2000 76 HZ 75 BB 88 88 86	HZ DB 94 92 85 83 82 80 87 79 85 77 85 77 75 73 72 73 72 73 72 74 000 70 HZ DB 87 85	HZ DB 89 87 81 79 77 76 82 74 80 73 74 73 74 73 74 73 74 73 74 73 74 73 74 73 74 73 74 73 74 73 74 73 74 80 69 68 67 800 66 HZ 82 80 82 80 80 80 82 80 80 82 80 80 82 80 80 82 80 82 80 80 82 80 80 82 80 80 80 80 80 80 80 80 80 80 80 80 80
RPM 1200 1100 1000 900 800 700 600 ¹ 200 600 ¹ 200 500 ¹ 100 450 ¹ 000 900 800 700 60 EXH ENGINESD RPM 1200 1100 1000	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.8 80.9 61.5 59.6 47.3 471.9 331.4 222.0 139.8 80.9 59.0 POWER BKW 1.118.5 861.5 647.3	BHP 1.500 1.155 868 633 444 298 109 155 79 868 633 444 298 Pressur⊧ Pressur⊧ Power BHP 1.500 1.155 868	100 98 96 94 93 90 93 90 93 88 89 88 88 88 88 88 86 84 ta (OBGF) OVER 81 DB(A) 93 91 89	HZ DB 106 104 102 101 99 98 90 98 96 97 96 97 96 97 96 97 96 94 92 91 92 91 92 91 92 94 92 94 92 94 92 94 92 94 92 94 92 94 92 94 92 94 92 94 92 90 125 89 HZ 00 98 97 90 98 98 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 98 97 96 97 98 97 96 97 98 97 96 97 98 97 97 96 97 98 97 96 97 98 97 96 97 98 97 96 97 98 98 97 98 97 98 97 96 97 98 97 97 96 97 98 97 98 97 98 97 98 98 97 97 96 97 98 98 97 98 98 97 96 97 98 98 97 97 96 97 98 98 97 97 96 97 98 98 97 97 96 97 97 96 97 98 97 98 97 98 97 99 98 98 97 99 98 97 97 98 98 97 97 98 98 97 97 98 98 97 97 98 98 97 98 97 98 98 97 98 98 97 98 98 97 98 98 97 98 98 97 98 98 97 98 98 97 98 98 97 97 98 98 97 97 98 98 97 97 98 98 97 97 98 98 97 97 97 98 98 97 97 97 97 97 97 97 97 97 97 97 97 97	DB 101 99 95 92 90 94 87 87 87 87 87 83 87 83 87 83 81 HZ DB 94 92 88 94 83 83 83 83 83 83 83 83 84 83 84 83 84 83 84 83 84 83 84 83 84 84 85 85 85 85 85 85 85 85 85 85	HZ DB 94 92 90 89 87 86 87 85 84 85 84 85 84 85 80 78 77 HZ 500 78 77 HZ 85 85	HZ DB 94 92 90 89 87 85 84 85 84 85 84 82 80 79 749. 1000 76 HZ 76 HZ 85 87 85 84	HZ DB 94 92 90 88 87 85 84 82 83 82 83 82 80 78 2000 ⁷⁶ HZ 75 HZ 75 BB 88 88 88 88 88 88 88 88 88 88 88 88	HZ DB 94 92 85 83 82 80 79 85 77 85 77 78 77 75 73 72 73 72 4000 70 HZ DB 87 85 78	HZ DB 89 87 81 79 77 76 82 74 82 73 80 73 74 73 74 73 74 73 74 73 80 69 68 800 66 HZ BB 82 80 74
RPM 1200 1100 1000 900 800 700 600 900 800 700 600 900 800 700 600 ENGINES SPEED RPM 1200 1100 1000 900	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.815 80.861.5 59.647.3 471.9 AUST Source BKW 1.118.5 861.5 80.9 59.0 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 59.0 80.9 50.0 80.9 50.0 80.9 50.0 80.9 50.0 80.7 8	BHP 1.500 1.155 868 633 444 298 79 868 633 444 298 79 868 633 444 298 Pressure ⊉98 Pressure ⊉98 Pressure 109 79 POWER BHP 1.500 1.155 868 633	100 98 96 94 93 91 90 93 88 88 88 88 88 88 88 88 86 84 ta (OBGF) OVER81 OVER81 DB(A) 93 91 89 88	HZ DB 106 104 102 101 99 98 96 97 96 97 96 94 92 92 91 92 91 92 92 91 92 92 91 92 92 92 92 92 92 92 92 92 92 92 92 92	DB 101 99 93 92 90 94 87 87 87 87 87 87 87 87 83 87 85 83 87 250 80 HZ DB 94 92 88 88 87	HZ DB 94 92 90 89 87 86 87 85 84 85 84 85 84 85 80 77 HZ DB 87 85 85 85 84	HZ DB 94 92 90 89 87 85 84 87 85 84 82 80 79 79 77 49. 79 77 49. 79 77 49. 80 76 1000 76 HZ 76 DB 87 85 84 82 82 80 87 85 84 82 80 84 82 80 83 84 82 80 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 85 84 85 85 84 85 85 84 85 85 84 85 85 84 85 85 84 85 86 86 85 86 86 85 86 86 85 86 86 87 85 86 86 86 87 87 85 86 86 86 86 86 86 86 86 86 87 85 86 86 86 86 87 86 86 87 86 86 86 86 86 86 86 86 86 86 86 86 86	HZ DB 94 92 90 88 87 85 84 88 82 80 78 2 6 2000 76 2000 76 HZ 75 DB 88 88 86 83 82 80 88 80 75 88 88 86 83 82	HZ DB 94 92 85 83 82 80 79 87 85 77 85 77 75 73 72 71 4000 70 HZ DB 87 85 78 77	HZ DB 89 87 81 79 77 76 82 73 80 73 74 73 74 73 74 73 74 73 74 73 74 73 74 75 8000 66 HZ 68 8000 66 HZ 74 72
RPM 1200 1100 1000 900 800 700 600 500 900 800 700 600 900 800 700 60 800 700 60 800 700 60 800 700 800 800 800 800 800 800 800	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.5 80.647.3 471.9 331.4 222.0 AUST Source BKW 1.118.5 861.5 59,0 900 ER BKW 1.118.5 861.5 647.3 471.9 331.4	BHP 1.500 1.155 868 633 444 298 187 500 198 868 633 444 298 Pressure Data 109 507 868 633 444 298 Pressure Data 633 444 298 109 109 109 109 109 109 109 109	100 98 96 94 93 91 90 93 88 89 88 88 88 88 88 86 ta (OB@F) over& 81 over& 81 DB(A) 93 91 88 88 88 88 88 88 88 88 88 88 88 88 88	HZ DB 106 104 102 101 99 98 100 98 96 97 96 92 DB 125 89 HZ 89 DB 100 98 97 96 94	DB 101 99 95 92 90 94 87 88 87 85 83 ances2 250 80 HZ DB 94 92 83 87 83 83 87 85 83 87 83 83 87 85 83 87 85 83 83 83 83 85 83 83 85 83 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 85 83 85 83 85 85 85 85 85 85 85 85 85 85	HZ DB 94 92 90 89 87 86 87 85 84 85 84 85 87 85 85 84 82	HZ DB 94 92 90 89 87 85 84 87 85 84 87 85 84 82 80 79 79 79 79 79 79 79 79 79 79 79 79 85 84 82 80 87 85 87 85 84 82 80 80 87 85 84 82 80 83 84 82 80 83 84 82 80 83 84 85 84 85 84 85 85 84 85 85 84 85 85 84 85 85 85 85 85 85 85 85 85 85 85 85 85	HZ DB 94 92 90 88 87 85 84 88 82 80 78 2 78 2 78 2 78 2 78 2 78 2	HZ DB 94 92 85 83 82 80 79 85 77 85 77 75 73 72 71 4000 70 HZ DB 87 85 78 77 75	HZ DB 89 87 77 76 82 74 80 73 74 80 73 74 72 71 69 68 8000 66 HZ 66 HZ 0B 82 80 74 72 71
RPM 1200 1100 1000 900 800 700 6001200 5001100 4501000 800 700 600EXH ENGINE50 SPEED RPM 1200 1100 900 800 700 60EXH 500 8PM 1200 1100 900 800 700	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.818.5 80.9617.3 59.647.3 471.9 331.4 222.0 AUST Sound ENGINE 80.9 POWER 59.0 POWER 59.0	BHP 1.500 1.155 868 633 444 298 187 500 187 500 187 500 187 500 187 500 187 500 187 500 187 500 187 79 868 633 444 298 Pressure BHP 1.500 1.155 868 633 444 298 844 298 109 109 109 109 109 109 109 109	100 98 96 94 93 90 93 88 91 88 89 88 88 86 ta (OBGF) OVERAL DB(A) 93 91 89 88 86 84	HZ DB 106 104 104 102 101 99 98 98 96 97 96 94 92 DB 100 98 97 96 97 96 94 92 96 94 92 96 97 96 97 96 97 96 94 92 97 96 97 96 94 92 97 96 97 97 97 97 98 97 97 98 97 98 97 98 97 98 97 98 97 97 98 97 97 98 97 97 98 97 98 97 97 97 98 97 97 98 97 96 97 97 97 96 97 96 97 97 97 97 97 97 97 96 97 96 97 97 97 96 97 97 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 96 97 97 97 97 97 97 97 97 97 97	DB 101 99 95 92 90 99 89 94 87 87 87 87 87 87 87 87 87 87	HZ DB 94 92 90 89 87 86 87 85 84 85 84 82 80 15 Mete 500 78 78 500 78 77 DB 87 85 85 85 84 82 80	H2 DB 94 92 90 89 87 85 84 87 85 84 80 79 rs (749. 1000 76 H2 76 H2 76 BB 87 85 84 82 80 79 79	HZ DB 94 92 90 88 87 85 84 82 83 82 83 82 80 78 2 76 2000 76 HZ 75 DB 88 88 86 83 82 80 78	HZ DB 94 92 85 83 82 80 79 87 77 85 73 77 75 73 72 71 4000 70 HZ DB 87 85 78 77 75 73	HZ DB 89 87 81 79 77 76 82 74 80 73 74 73 74 73 74 73 74 73 74 73 74 73 74 73 74 73 74 73 74 73 74 73 74 72 71 69 800 66 HZ 82 80 76 77 77 71 68 82 73 70 77 71 72 71 68 80 73 74 72 71 71 72 71 71 72 71 71 72 71 68 80 73 74 72 71 68 80 73 74 72 71 68 80 73 74 72 71 68 80 73 74 72 71 69 80 74 72 71 69 80 74 72 71 69 80 74 72 71 69 80 77 71 69 80 77 71 69 80 77 71 69 80 72 71 69 80 77 71 69 80 77 71 69 80 77 71 69 80 77 71 69 80 77 71 69 80 77 71 69 80 77 71 69 80 77 71 69 80 77 71 69 80 77 71 69 80 77 71 69 80 77 71 69 80 77 71 69 80 77 71 69 80 77 71 71 69 80 77 71 71 69 80 77 71 71 71 71 71 71 71 71 71 71 71 71
RPM 1200 1100 1000 900 800 700 600 500 900 800 700 600 900 800 700 60 800 700 60 800 700 60 800 700 800 800 800 800 800 800 800	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.5 80.647.3 471.9 331.4 222.0 AUST Source BKW 1.118.5 861.5 59,0 900 ER BKW 1.118.5 861.5 647.3 471.9 331.4	BHP 1.500 1.155 868 633 444 298 187 500 198 868 633 444 298 Pressure Data 109 507 868 633 444 298 Pressure Data 633 444 298 109 109 109 109 109 109 109 109	100 98 96 94 93 91 90 93 88 89 88 88 88 88 88 86 ta (OB@F) over& 81 over& 81 DB(A) 93 91 88 88 88 88 88 88 88 88 88 88 88 88 88	HZ DB 106 104 102 101 99 98 100 98 96 97 96 92 DB 125 89 HZ 89 DB 100 98 97 96 94	DB 101 99 95 92 90 94 87 88 87 85 83 ances2 250 80 HZ DB 94 92 83 87 83 83 87 85 83 87 83 83 87 85 83 87 85 83 83 83 83 85 83 83 85 83 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 83 85 85 83 85 83 85 85 85 85 85 85 85 85 85 85	HZ DB 94 92 90 89 87 86 87 85 84 85 84 85 87 85 85 84 82	HZ DB 94 92 90 89 87 85 84 87 85 84 87 85 84 82 80 79 79 79 79 79 79 79 79 79 79 79 79 85 84 82 80 87 85 87 85 84 82 80 80 87 85 84 82 80 83 84 82 80 83 84 82 80 83 84 85 84 85 84 85 85 84 85 85 84 85 85 84 85 85 85 85 85 85 85 85 85 85 85 85 85	HZ DB 94 92 90 88 87 85 84 88 82 80 78 2 78 2 78 2 78 2 78 2 78 2	HZ DB 94 92 85 83 82 80 79 85 77 85 77 75 73 72 71 4000 70 HZ DB 87 85 78 77 75	HZ DB 89 87 77 76 82 74 80 73 74 80 73 74 72 71 69 68 8000 66 HZ 66 HZ 0B 82 80 74 72 71
RPM 1200 1100 1000 900 800 700 6001200 5001100 4501000 900 800 700 600EXH ENGIN500 SPEED RPM 1200 1100 900 800 700 600	BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.818.5 80.815.5 59.47.3 471.9 331.4 222.0 AUST Sound POWER BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.81 80.9 59.0 1.118.5 80.9 59.0 80.9 50.0 80.0 8	BHP 1.500 1.155 868 633 444 298 187 500 198 633 444 298 BHP 1.55 868 633 444 298 847 109 155 109 109 155 109 155 109 109 1155 868 103 444 298 187 187 187 187 187 187 187 18	100 98 96 94 93 91 90 93 91 88 89 88 88 86 84 ta (OBGF) OVER 87 DE (A) 93 91 89 88 86 84 83	HZ DB 106 104 102 101 99 98 96 97 96 97 96 94 92 90 125 89 HZ 90 125 89 HZ 90 125 89 HZ 90 125 89 97 96 94 92 92 91	DB 101 99 95 92 90 89 87 88 87 85 83 87 85 83 87 85 83 87 85 83 87 85 83 87 85 83 87 85 83 80 94 92 80 80 80 80 80 80 80 80 80 80	HZ DB 94 92 90 89 87 86 87 85 84 85 84 85 84 82 80 77 HZ 77 DB 87 85 85 85 84 82 80 79	H2 DB 94 90 89 87 85 84 87 85 84 82 80 79 rs (749. 76 1000 76 1000 76 1000 76 85 84 85 84 82 80 79 77 77	HZ DB 94 92 90 88 87 85 84 88 82 83 82 80 78 2000 ⁷⁶ HZ 75 DB 88 88 86 83 82 80 77 75 76 76 76 76 76 76 76 76 76 76 76 76 76	HZ DB 94 92 85 83 82 80 79 87 77 85 77 78 77 75 73 72 4000 HZ DB 87 85 78 77 75 73 72 73 72 73 72 73 72	HZ DB 89 87 81 79 77 76 82 73 80 73 74 73 74 73 74 73 74 73 74 69 68 67 8000 66 HZ DB 82 80 74 72 71 69 68

Perfor	mance Numbe	er: DM8730	Ch	ange Level:	01					
Sales Model: 3512200	1,118.5	1,500	101	97	Ra96d	Speed (F	DDM\- 951	200 96	93	96
Application: MARINE P		1,155	100	96	Defed	Power9(E	94 1	110 ⁹⁵	92	95
			99	96	кајези	Poweg ₉ (E	94	, 110.0 ₉₅	91	95
Rating Level: A RaddNG	•			95		l Powes (l			91	94
800 700	331.4 222.0	444 298	98 97	95 94	92 91	88 87	92 92	93 93	90 90	94 93
MÉGHAN	NICAL Sound	Pressure			ancego	1 Meete	rs (913.3	3 Fegezt)	90 89	93
ENGIN500	80.9	100	OVERAL				1000 ₉₀	01		
SPEED	ENGINE 59.0 POWER	ENGINE 79 POWER		125 93 HZ	250 90 HZ	500 ⁸⁶ HZ	HZ	2000 ₉₁ HZ	4000 ₈₈ нz	8000 ₉₁ HZ
RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
1200	1.118.5	1.500	101	97	94	90	95	96 05	93	96 05
1100 1000	861.5 647.3	1,155 868	100 99	96 96	94 93	89 89	94 94	95 95	92 91	95 95
900	471.9	633	99	90 95	92	88	93	94	91	94
800	331.4	444	98	95	92	88	92	93	90	94
700,1200	222.0 136 118.5	298 101,500	97 07 89	94 02 85	91 00 82	87 86 78	92 01 83	93 02 84	90 80 81	93 02 84
700 6001200 5001100	139.0	187 ^{,500} 109,155	97	93 04	90 82 90 82	⁰⁰ 77	31 00	92 00	09 00	92 00
500 ¹¹⁰⁰ 450 ¹⁰⁰⁰	80.9 ^{01.5} 59.647.3	109 ¹⁰⁰ 79 ⁸⁶⁸	96 88 96 87	93 ⁸⁴ 92 ⁸⁴	90 81 90 81	86 77 85 77	91 ⁰² 90 ⁸²	91 ⁸³ 91 ⁸³	88 80 88 80	92 83 91 83
450 900	59.0 471.9	⁷⁹ 633	96 87	92 83	80	⁸⁵ 76	90 81	82	88 79	82
800	331.4	444	86	83	80	76	81	81	78	82
700 MEQUAN	222.0 NICAL Sound	298 Prossure Pat		82 Dist	79 ance%	75 7 Miete	80 re (783	.0 Feget)	78 77	81
	80.9	100		• ·						80 80
ENGIN ⁵⁰⁰ SPEED	ENGINE 59.0 POWER	ENGINE 79 POWER		125 81 HZ	250 ⁷⁸ HZ	500 ⁷⁴ 73 HZ	1000 ⁷⁹ HZ	2000 ⁸⁰ HZ	4000 ⁷⁶ HZ	8000 ⁸⁰ HZ
RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
			()							
1200	1.118.5	1.500	89	85	82	78	83	84	81	84
1100	861.5	1,155	89 88	85 84	82	77	82	84 83	81 80	84 83
1100 1000	861.5 647.3	1.155 868	89 88 87	85 84 84	82 81	77 77	82 82	84 83 83	81 80 80	84 83 83
1100 1000 900	861.5 647.3 471.9	1,155 868 633	89 88 87 87	85 84 84 83	82 81 80	77 77 76	82 82 81	84 83 83 82	81 80 80 79	84 83 83 82
1100 1000 900 800 700	861.5 647.3 471.9 331.4 222.0	1,155 868 633 444 298	89 88 87 87 86 85	85 84 84 83 83 83	82 81 80 80 79	77 77 76 76 75	82 82 81 81 80	84 83 83 82 81 81	81 80 80 79 78 78	84 83 83 82 82 82 81
1100 1000 900 800 700 6001200	861.5 647.3 471.9 331.4 222.0 139.8 ^{18.5}	1.155 868 633 444 298 407500	89 88 87 87 86 85 85 85 85	85 84 83 83 83 82 81 79	82 81 80 80 79 79 77	77 77 76 76 75 74 72	82 82 81 81 80 79 77	84 83 82 81 81 80 78	81 80 80 79 78 78 77 75 77 75	84 83 82 82 82 81 80 78
1100 1000 900 800 700 600 ¹ 200 500 ¹ 100	861.5 647.3 471.9 331.4 222.0 139.818.5 80.81.5	1.155 868 633 444 298 187 500 187 500	89 88 87 87 86 85 85 83 85 82 82	85 84 84 83 83 83 82 81 79 81 79 81 79	82 81 80 80 79 79 79 76 78 76	77 76 76 75 74 72 74 72	82 81 81 80 79 77 79 77	84 83 82 81 81 80 78 80 78	81 80 79 78 78 77 75 76 74 76 74	84 83 82 82 81 80 78 80 78 80 77
1100 1000 900 800 700 600 ¹ 200 500 ¹ 100 450 ¹ 000	861.5 647.3 471.9 331.4 222.0 139.818.5 139.815.5	1.155 868 633 444 298 187 500 187 109 155 79 868	89 88 87 87 86 85 85 83 85 82 84 82	85 84 83 83 82 81 79 81 79 81 79 80 78	82 81 80 79 79 79 76 78 76 78 75	77 77 76 76 75 74 72	82 81 81 80 79 77 79 77 79 77 78 76	84 83 82 81 81 80 78 80 78 80 78 70 77	81 80 80 79 78 78 77 75 76 74 76 74	84 83 82 82 81 80 78 80 78 80 78 79 77
1100 1000 900 800 700 600 ¹ 200 500 ¹ 100	861.5 647.3 471.9 331.4 222.0 139.818.5 80.861.5 59.647.3	1.155 868 633 444 298 187 500 187 500	89 88 87 87 86 85 85 83 85 82 82	85 84 84 83 83 83 82 81 79 81 79 81 79	82 81 80 80 79 79 79 76 78 76	77 77 76 76 75 74 72 74 72 74 72 73 71	82 81 81 80 79 77 79 77	84 83 82 81 81 80 78 80 78	81 80 79 78 78 77 75 76 74 76 74	84 83 82 82 81 80 78 80 78 80 77
1100 1000 900 800 700 600 ¹ 200 600 ¹ 200 500 ¹ 100 450 ¹ 000 900 800 700	$\begin{array}{c} 861.5\\ 647.3\\ 471.9\\ 331.4\\ 222.0\\ 139.818.5\\ 80.961.5\\ 59.647.3\\ 59.647.3\\ 371.4\\ 222.0\end{array}$	1.155 868 633 444 298 187 500 187 500 187 155 109 155 79 868 633 444 298	89 88 87 87 86 85 83 85 83 84 82 84 82 84 81 80 80	85 84 83 83 82 81 79 81 79 81 78 80 77 77 76	82 81 80 80 79 79 76 78 75 75 75 74 73	77 76 76 75 74 72 74 72 74 72 74 71 70 70 69	82 81 81 80 79 77 79 77 76 75 75 75 74	84 83 82 81 81 80 78 80 78 79 77 76 76 75	81 80 80 79 78 77 75 76 74 76 74 73 72 72	84 83 82 82 81 80 78 80 78 80 77 76 76 76 75
1100 1000 900 800 700 600 ¹ 200 500 ¹ 100 450 ¹ 000 900 800 700 ME&HAN	861.5 647.3 471.9 331.4 222.0 139.818.5 39.847.3 59.647.3 471.9 331.4 222.0 NICAL Sound	1.155 868 633 444 298 187,500 187,500 187,500 109,155 79,868 633 444 298 Pressure	89 88 87 87 86 85 85 85 82 84 82 84 82 84 82 84 82 84 82 84 81 80 80 80 80 80	85 84 83 83 82 81 79 81 78 80 77 77 76 1 2 15 15	82 81 80 79 79 78 76 78 75 75 75 74 73 ance/3	77 76 76 75 74 72 74 72 74 72 74 72 74 72 74 70 69 15 Mete	82 81 81 80 79 77 79 77 78 76 75 75 75 74 rs (7 49 .	84 83 82 81 81 80 78 80 78 80 77 76 76 76 76 75 2 Feet)	81 80 79 78 78 77 75 76 74 76 74 76 74 73 72 72 72 71	84 83 82 82 81 78 80 78 80 78 79 77 76 76 75 75
1100 1000 900 800 700 600 1200 600 1200 600 1000 450 1000 450 900 800 700 ME&HAN ENGIN 450 900	861.5 647.3 471.9 331.4 222.0 139.818.5 80.615 59.647.3 331.4 222.0 NICAL Sound ENGINE 80.9 59.0	1.155 868 633 444 298 109 155 79 868 633 444 298 Pressure Dat ENGINE 109 79	89 88 87 87 86 85 83 85 83 84 82 84 82 84 81 80 80	85 84 83 83 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 77 77 76 12ist 75	82 81 80 79 79 76 78 75 75 75 75 74 73 ance/3 250 72 72	77 76 76 75 74 72 74 72 74 72 74 72 74 72 74 72 74 70 69 9 15 Mete 500 68	82 81 81 80 79 77 78 76 75 75 74 rs (7 49 . 1000 ⁷³ 1000 ⁷³	84 83 82 81 81 80 78 80 78 80 78 80 78 70 76 76 75 2 Fexet) 2000 ⁷ / ₄	81 80 80 79 78 78 77 75 76 74 76 74 76 74 76 74 72 72 72 71 4000 70	84 83 82 82 81 80 78 80 77 76 76 76 75 75 75 800074
1100 1000 900 800 700 600 1200 600 1000 450 1000 800 700 MECHAN ENGIN 500 SPEED	861.5 647.3 471.9 331.4 222.0 139.818.5 80.647.3 59.647.3 331.4 222.0 NICAL Sound ENGINE 80.9 POWER	1.155 868 633 444 298 187 500 109 155 79 868 633 444 298 Pressure Dat ENGINE 109 POWER	89 88 87 87 85 85 85 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 81 80 80 82 82 83 82 83 83 83 83 83 83 83 83 83 83 83 83 83	85 84 83 83 81 79 81 79 81 79 81 79 81 79 81 79 81 77 77 6 12ist 75 125 75 HZ	82 81 80 80 79 78 76 75 75 75 74 73 ance73 250 72 HZ	77 76 76 75 74 72 74 72 74 72 74 72 74 72 74 72 74 70 69 15 Meste 500 68 HZ	82 81 81 80 79 77 79 76 75 75 74 rs (7 49 . 1000 ⁷³ HZ	84 83 82 81 81 80 78 80 78 80 78 80 78 76 76 76 75 2 Feret) 2000 ⁷⁴ HZ	81 80 80 79 78 78 77 75 76 74 76 74 76 74 76 74 72 72 72 71 4000 71 HZ	84 83 82 82 81 78 80 78 80 77 76 76 76 75 75 75 800074 HZ
1100 1000 900 800 700 600 1000 500 1000 900 800 700 MECHAN ENGIN 500 SPEED RPM	861.5 647.3 471.9 331.4 222.0 139.818.5 80.615 59.647.3 331.4 222.0 NICAL Sound ENGINE 80.9 59.0 POWER 59.0	1.155 868 633 444 298 187 500 187 500 187 500 187 500 187 500 444 298 Pressure Dat ENGINE 109 79 POWER BHP	89 88 87 87 86 85 83 84 82 84 82 84 82 84 82 84 82 84 82 84 81 80 80 80 ta (OBCF) OVERĂ ^β L DB(A)	85 84 83 83 81 79 81 79 81 79 81 79 81 79 81 79 80 77 77 6 125 75 HZ DB	82 81 80 79 78 76 78 76 75 75 74 73 ance:3 250 72 HZ DB	77 76 76 75 74 72 74 72 74 72 74 72 74 72 74 72 70 69 15 Meste 500 68 HZ DB	82 81 81 80 79 77 79 77 78 76 75 75 74 rs (7 49 . 1000 ⁷³ HZ DB	84 83 82 81 81 80 78 80 78 80 78 80 78 76 76 76 76 76 76 76 75 2 Feret) 2000 ⁷⁴ HZ DB	81 80 80 79 78 78 77 75 76 74 76 74 76 74 72 72 72 71 4000 71 HZ DB	84 83 82 82 81 78 80 78 80 77 76 76 75 75 75 8000 74 HZ DB
1100 1000 900 800 700 600 ¹ 200 600 ¹ 200 500 ¹ 100 450 ¹ 900 800 700 MECHAN ENGIN 500 SPEED RPM 1200	861.5 647.3 471.9 331.4 222.0 139.818.5 80.815 59.647.3 471.9 331.4 222.0 NICAL Sound ENGINE 80.9 POWER BKW 1.118.5	1.155 868 633 444 298 109 155 109 155 79 868 633 444 298 Pressurei Dat ENGINE 109 POWER 109 POWER 109 BHP 1.500	89 88 87 87 86 85 85 82 84 82 84 82 84 82 81 80 80 80 0VERABL DB(A) 83	85 84 83 83 81 79 81 79 81 79 80 77 77 76 125 75 125 75 HZ 79	82 81 80 79 79 78 76 75 75 74 73 80 76 75 75 74 73 80 72 250 72 HZ DB	77 76 76 75 74 72 74 72 74 72 74 72 74 70 69 15 Mete 500 68 HZ BB 72	82 81 81 80 79 77 79 76 75 75 75 74 75 75 74 9 75 75 74 9 75 75 74 9 75 75 74 9 75 75 74 9 75 75 75 75 74 9 77 77 77 77 77 77 77 77 77 77 77 77 7	84 83 82 81 81 80 78 80 78 80 78 77 76 76 76 75 2 Fezet) 2000 74 2000 74 2000 73 HZ 78	81 80 80 79 78 78 77 75 76 74 76 74 76 74 76 74 72 72 71 4000 71 HZ DB 75	84 83 82 82 81 80 78 80 76 76 76 76 75 75 8000 74 HZ DB
1100 1000 900 800 700 500 1000 450 900 800 700 MECHAN ENGIN 550 SPEED RPM 1200 1100	861.5 647.3 471.9 331.4 222.0 139.818.5 30.647.3 59.647.3 471.9 331.4 222.0 NICAL Sound ENGINE 80.9 POWER 80.9 POWER 80.9 ENGINE 59.0 POWER 80.9 59.0 POWER 80.9	1.155 868 633 444 298 109 187 500 187 500 187 500 863 444 298 Pressure 98 Pressure 998 Pressure 909 POWER BHP 1.500 1.155	89 88 87 87 86 85 85 83 84 82 84 82 84 82 84 82 84 82 80 80 80 ta (OBÇF) over, 78 81 80 80 80 80 80 80 80 80 80 80 80 80 80	85 84 83 83 82 79 81 79 81 79 80 77 77 76 125 75 125 75 125 75 HZ 79 79 79	82 81 80 79 79 78 76 78 76 75 75 74 73 ance 73 250 72 250 72 DB 77 77 76	77 76 76 75 74 72 74 72 74 72 73 71 70 69 15 Mete 500 68 HZ DB 72 72	82 82 81 81 79 77 78 76 75 75 75 75 74 rs (7 49 . 1000 73 hz DB	84 83 82 81 81 80 78 80 78 76 76 76 76 75 2 Feet) 2000 74 2000 73 HZ DB	81 80 80 79 78 78 77 75 76 74 76 74 76 74 73 72 72 71 71 4000 70 HZ DB	84 83 82 82 81 78 80 78 79 76 76 76 75 75 75 8000 74 BDB 78 78 78
1100 1000 900 800 700 600 ¹ 200 500 ¹ 100 450 ¹ 000 900 800 700 ME@HAN ENGIN 500 SPEED RPM 1200 1100 1000	861.5 647.3 471.9 331.4 222.0 139.818.5 80.9647.3 59.647.3 471.9 331.4 222.0 NICAL Sound POWER BKW 1.118.5 861.5 647.3	1.155 868 633 444 298 187 500 187 55 79 868 633 444 298 Pressure Passure BHP 1.500 1.155 868	89 88 87 87 86 85 83 84 82 84 82 84 82 84 81 80 80 80 80 ta (OBCF) over 4 81 80 80 80 ta (OBCF) 0 ver 4 81 80 80 80 80 80 80 80 80 80 80 80 80 80	85 84 84 83 83 82 79 81 79 81 79 77 76 125 75 125 75 HZ 79 79 78	82 81 80 79 79 78 76 78 76 75 75 74 73 ance 73 250 72 HZ DB 77 77 76 75	77 76 76 75 74 72 74 72 74 72 74 73 71 70 69 15 Mete 500 68 HZ 500 68 HZ 72 72 72 71	82 81 81 81 79 77 78 76 75 74 75 74 75 74 75 74 75 74 9 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 75 74 75 75 74 75 75 77 77 75 75 75 75 75 75 75 75 75	84 83 82 81 80 78 79 77 76 76 75 2 Feet) 2000 74 2000 74 BB 78 78 78 77	81 80 80 79 78 77 75 77 74 76 74 76 74 72 72 71 71 4000 70 HZ DB 75 74 74	84 83 82 82 81 78 80 77 76 76 75 75 75 8000 74 HZ DB 78 78 77
1100 1000 900 800 700 500 1000 450 900 800 700 MECHAN ENGIN 550 SPEED RPM 1200 1100	861.5 647.3 471.9 331.4 222.0 139.818.5 30.647.3 59.647.3 471.9 331.4 222.0 NICAL Sound ENGINE 80.9 POWER 80.9 POWER 80.9 ENGINE 59.0 POWER 80.9 59.0 POWER 80.9	1.155 868 633 444 298 109 187 500 187 500 187 500 863 444 298 Pressure 98 Pressure 998 Pressure 909 POWER BHP 1.500 1.155	89 88 87 87 86 85 85 83 84 82 84 82 84 82 84 82 84 82 80 80 80 ta (OBÇF) over, <i>7</i> ⁸ ₈ L DB(A) 83 82	85 84 83 83 82 79 81 79 81 79 80 77 77 76 125 75 125 75 125 75 HZ 79 79 79	82 81 80 79 79 78 76 78 76 75 75 74 73 ance 73 250 72 250 72 DB 77 77 76	77 76 76 75 74 72 74 72 74 72 73 71 70 69 15 Mete 500 68 HZ DB 72 72	82 82 81 81 79 77 78 76 75 75 75 75 74 rs (7 49 . 1000 73 hz DB	84 83 82 81 81 80 78 80 78 76 76 76 76 75 2 Feet) 2000 74 2000 73 HZ DB	81 80 80 79 78 78 77 75 76 74 76 74 76 74 73 72 72 71 71 4000 70 HZ DB	84 83 82 82 81 78 80 78 79 76 76 76 75 75 75 8000 74 BDB 78 78 78
1100 1000 900 800 700 600 1200 600 1000 900 800 700 ME&HAN ENGIN 500 SPEED RPM 1200 1100 1000 900 900	861.5 647.3 471.9 331.4 222.0 139.861.5 59.647.3 331.4 222.0 VICAL Source ENGINE 80.9 59.0 POWER 80.9 59.0 POWER 80.9 59.0 POWER 80.9 59.0 POWER 80.9 59.0 POWER 80.9 59.0 FOWER 80.9 50.0 FOWER 80.9 FOWER 80.9	1.155 868 633 444 298 500 187 109 185 79 868 633 444 298 Pressure BHP 1.500 1.155 868 633	89 88 87 87 86 85 83 84 82 84 82 84 82 84 81 80 CVER	85 84 83 83 82 79 81 79 81 79 80 78 77 76 125 75 125 75 HZ 79 79 79 78 77	82 81 80 80 79 77 78 76 78 75 75 74 73 80 72 72 72 72 72 72 72 72 72 72	77 76 76 75 74 72 74 72 74 72 74 73 70 69 15 Mete 500 68 HZ 72 72 71 70	82 81 81 80 79 77 78 75 75 74 75 rs (7 49 100073 HZ 73 HZ 77 77 76 75	84 83 82 81 81 80 78 80 78 79 76 76 75 2 Feet 72 9 76 76 76 75 2 9 76 76 75 76 76 75 76 76 73 HZ 78 78 78 78 78 78 78 78 78 77 76 76 75 76 76 77 76 76 77 76 76 77 76 76 77 76 76	81 80 80 79 78 78 77 75 76 74 76 74 76 74 72 72 72 71 4000 71 4000 70 HZ DB 75 74 74 73	84 83 82 82 81 80 78 80 77 76 76 75 8000 74 HZ DB 78 78 77 76 76 76 75
1100 1000 900 800 700 600 ¹ 200 600 ¹ 200 500 ¹ 100 450 ¹ 900 800 700 MECHAN ENGIN 500 SPEED RPM 1200 1100 1000 900 800 700 600	861.5 647.3 471.9 331.4 222.0 139.818.5 80.815 59.647.3 331.4 222.0 NICAL Sound ENGINE 80.9 POWER 80.9 POWER 80.9 BKW 1.118.5 861.5 647.3 471.9 331.4 222.0 139.8	1.155 868 633 444 298 109 155 109 165 79 868 633 444 298 Pressure⊨Dat ENGINE 109 POWER 109 POWER 109 POWER 109 POWER 109 BHP 1.550 1.155 868 633 444 298 633	89 88 87 87 86 85 85 82 84 82 84 82 81 80 OVER 5 81 OVER 81 80 DE (A) 83 82 82 81 80 79	85 84 84 83 82 79 81 79 81 78 80 77 77 76 125 75 125 75 125 75 125 75 125 75 125 75 125 75 125 75 125 75 125 75 125 75 125 75 125 75 125 75 126 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75 127 75	82 81 80 79 79 77 78 76 75 74 73 ance 73 250 72 250 72 DB 77 76 75 75 74 73 73 73	77 76 76 75 74 72 74 72 74 70 69 15 Mete 500 68 HZ 70 68 HZ 72 72 71 70 70 69 9 9 9 9 9 9 9 9 9 72 72 71 70 70 68 9 70 70 69 70 70 70 70 70 70 70 70 70 70 70 70 70	82 82 81 81 79 77 79 76 75 75 74 76 75 75 75 75 75 75 75 75 74 75 75 75 75 75 75 75 75 75 75 75 75 75	84 83 82 81 81 80 78 80 78 79 76 76 76 75 2000 74 2000 74 2000 74 2000 73 HZ 78 78 77 76 75 75 74	81 80 80 79 78 77 75 77 76 74 76 74 76 74 70 HZ 72 71 4000 70 HZ 75 74 74 73 72 72 72 71 71 73 72 72 72 71	84 83 83 82 82 81 78 80 76 76 76 75 75 8000 74 HZ DB 78 78 78 77 76 76 75 75 75
1100 1000 900 800 700 600 ¹ 200 600 ¹ 200 600 ¹ 200 600 ¹ 200 800 700 MECHAN ENGIN 500 SPEED RPM 1200 1100 1000 900 800 700 SPEED	861.5 647.3 471.9 331.4 222.0 139.818.5 80.9617.3 59.647.3 331.4 222.0 NICAL Sound ENGINE 80.9 59.0 POWER 59.0 POWER 59.0 POWER 59.0 BKW 1.118.5 861.5 647.3 471.9 331.4 222.0	1.155 868 633 444 298 187 500 109 185 79 868 633 444 298 Pressure BHP 1.500 1.155 868 633 444 298	89 88 87 87 86 85 83 84 82 84 82 84 82 84 80 80 DVERA ^β DB (A) 83 82 82 81 80 80 83 82 83 83 82 84 83 80 80 80 80 80 80 80 80 80 80	85 84 84 83 83 82 79 81 79 81 79 77 76 125 75 125 75 125 75 HZ 79 79 79 79 78 77 77 76	82 81 80 79 79 78 76 75 75 74 73 ance 73 250 72 HZ 77 76 75 75 74 73	77 76 76 75 74 72 74 72 74 70 69 15 Meste 500 68 68 68 HZ 72 72 72 71 70 70 69 9	82 81 81 80 79 77 78 76 75 75 74 rs (7 49). 73 hz 77 77 76 75 75 75 75 74	84 83 82 81 81 80 78 80 78 76 76 75 2 Feeet) 2000 ⁷⁴ 78 78 78 78 77 76 76 76 75	81 80 80 79 78 78 77 75 76 74 76 74 76 74 72 72 71 4000 71 HZ 75 74 74 73 72 72 72 72	84 83 82 82 81 80 78 80 77 76 76 75 8000 74 HZ DB 78 78 77 76 76 76 75

Data Date: 3/29/2011

	mance Numbe	r: DM8731	Cha	nge Level:	01					
Sales Model: 351200	1,193.0	1,600	114	119	Rátéd	Speed (I	RPM1 05 1	200108	107	105
Application: MARINE P	ROPULSION	1,232	112	117	Rated	Power (105	KW ¹⁰³ 1	193196	105	103
Rating Level: B-RAJING		926	110	114	Rate			,100,00	99	94
Rating Level: D-rggg ING	(⊓⊏AV 150393) 353.5	Y) 675 474	108 106	112 110	104	100 Pow <u>er</u> (י ₉₉ 101 ו	,000 ₁₀₄ 102	97 95	92 91
				109	104	99	99 98	102	95 94	91 89
600 EXH	AUST Soughd	Pressuredat	ta (OBĢĒ)	1 D ist	anceo	1.5 Mete	rs (964.	9 Feet)	92	88
ENGINE 500 ENGINE	ENGINE 86.3	ENGINE 116	OVERALL	125	250 99	500 96	100_{94}^{95}	200098	40090	800086
SPEED	POWER 62.9	POWER 84	01-101-	HZ	HZ ⁹⁹	HZ ⁹⁵	HZ ⁹⁴	HZ ⁹⁷	HZ	HZ ⁸⁶
RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
1200	1.193.0	1.600	114	119	114	107	105	108	107	105
1100	918.9	1,232	112	117	112	105	103	106	105	103
1000	690.4	926	110	114	108	104	103	106	99	94
900	503.3	675	108	112	106	102	101	104	97	92
800 700	353.5 236.8	474 318	106 105	110 109	104 103	100 99	99 98	102 101	95 94	91 89
co.1200	1,1,01,93.0	ode600	105 103	40-107	404101	99 97 94	oc 94	101 99 95	94 92 94	gg 89
End 100	86938.9	110232	103100 10298 10298	400100	100 99	96 ⁹²	05 92	<u></u> 93	01 92	86 87
450,000	62690.4	84 ⁹²⁶	101 96	105104	99 95	₉₅ 92	94 91	97 90	90 85	86 81
900	503.3	675	95	105	94	91	89	89	84	79
800 700	353.5 236.8	474 318	93 91	101 99	92 90	89 87	87 86	87 85	82 80	78 76
600 EXH	AUST Sound	Pressuredat	ta (OBĞF)	₉ pist	anceg	7 Miete	rs (₈₄ 23	.0 Feget)	79	70 75
ENGINE 500	ENGINE 86.3	ENGINE 116	OVERALL	125 ⁹⁶ 96	250 ⁸⁷ 87	500 ⁸⁴ 84	1000 ⁸³ 100082	2000 ⁸² ₈₂	400077	8000 ⁷³
SPEED	POWER 62.9	POWER 84	OVERALL	HZ ⁹⁶	230 ₈₇ HZ	500 ₈₄ НZ	HZ ⁸²	2000 HZ	4000 ₇₇ HZ	н х
RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
1200	1.193.0	1.600	100	107	101	94	94	95	94	89
1100	918.9	1,232	98	105	99	92	92	93	92	87
1000	690.4	926	96	104	95	92	91	90	85	81
900 800	503.3 353.5	675 474	95 93	103	94	91 89	89 87	89 87	84 82	79 78
700				101						
	236.8	210		101 99	92 90		86	85		
cod200	236.8 149 ^{1,93.0}	318 01e600	91 92 94	99 00 100	90 90 95	87 86 ⁸⁸	86	85	80 70 88	76 75 83
600 ²⁰⁰	1,1,93.0	318 200 ⁶⁰⁰ 112232	91 90 94 88 92	99 98 100 96 98	90 89 95 97 93	87 86 ⁸⁸ 84 86	86 84 87 83 85	85 84 88 82 86	80 79 ⁸⁸ 77 86	76 75 83 73 81
600 ²⁰⁰ 500 ¹⁰⁰ 450 ⁰⁰⁰	149193.0 86938.9 62690.4	318 200 ⁶⁰⁰ 116 ²³² 84 ⁹²⁶	91 90 94 88 92 88 90	99 98 100 96 98 96 98	90 89 95 87 93 87 89	87 86 ⁸⁸ 84 86 84 86	86 84 87 83 85 82 84	85 84 88 82 86 82 84	80 79 88 77 86 77 79	76 75 ⁸³ 73 81 73 75
600 ²⁰⁰ 500 ¹⁰⁰ 450 ⁰⁰⁰ 900	149193.0 86938.9 62690.4 503.3	318 200 ⁶⁰⁰ 116 ² 32 84 ⁹ 26 675	91 90 94 88 92 88 90 88 88	99 98 100 96 98 96 98 96 98 96	90 89 95 87 93 87 89 87 87	87 86 88 84 86 84 86 84 84	86 84 87 83 85 82 84 82	85 84 88 82 86 82 84 82 82	80 79 88 77 86 77 79 77 77	76 75 83 73 81 73 75 73 73
600 200 500 100 450 000 900 800	149193.0 86938.9 62690.4 503.3 353.5	318 200 ⁶⁰⁰ 116 ²³² 84 ⁹²⁶ 675 474	91 90 94 88 92 88 90 88 88 88 88	99 98 100 96 98 96 98 96 96 94	90 89 95 87 93 87 89 87 87 85	87 86 88 84 86 84 86 84 84 82	86 84 83 85 82 84 82 81 79	85 84 88 82 86 82 84 82 80 79	80 79 88 77 86 77 79 77 77 75	76 75 83 73 81 73 75 73 73 73 71
600 200 500 100 450 000 900 800 700	149193.0 86938.9 62690.4 503.3	318 200 ⁶⁰⁰ 116232 84926 675 474 318	91 90 94 88 92 88 90 88 88 88 86 85	99 98 100 96 98 96 98 96 96 94 94 93	90 89 95 87 93 87 89 87 87 85 84 84 84 84 84	87 86 88 84 86 84 86 84 82 81 15 Mete	86 84 87 83 85 82 84 82 81 79	85 84 88 82 86 82 84 82 82	80 79 88 77 86 77 79 77 77	76 75 83 73 81 73 75 73 73
600 ²⁰⁰ 500100 450 ⁰⁰⁰ 800 700 600 EXH	149193.0 86938.9 62690.4 503.3 353.5 236.8 AUST Sound	318 200 ⁶⁰⁰ 116 ²³² 84 ⁹²⁶ 675 474 318 Pressure@@at	91 90 92 88 90 88 86 85 ta (OB§F)	99 98 100 96 98 96 98 96 94 93 9 Dist	90 89 95 87 93 87 89 87 87 85 84 84 84 84 84	87 86 88 84 86 84 86 84 82 81 15 Mete	86 84 83 85 82 84 82 81 79 rs (78 49	85 84 82 84 82 84 82 80 79 .2 F çe t)	80 79 88 77 86 77 79 77 75 74 72	76 75 83 73 81 73 75 73 73 71 69 68
600 200 500 100 450 000 900 800 700	49193.0 86938.9 62690.4 503.3 353.5 236.8 AUST Sound	318 200 ⁶⁰⁰ 116 ²³² 84 ⁹²⁶ 675 474 318 Pressure0@at	91 90 94 88 92 88 90 88 88 88 86 85	99 98 100 96 98 96 98 96 96 94 94 93	90 89 95 87 93 87 89 87 87 85 84 84 84 84 84	87 86 88 84 86 84 86 84 84 82 81	86 84 87 83 85 82 84 82 81 79	85 84 88 82 86 82 84 82 80 79	80 79 88 77 86 77 79 77 77 75 74	76 75 83 73 81 73 75 73 73 71 69
600 ²⁰⁰ 500 ¹⁰⁰ 450 ⁰⁰⁰ 800 700 600 EXH ENGIN ⁵⁰⁰ ENGIN ⁵⁰⁰	149193.0 86938.9 62690.4 503.3 353.5 236.8 AUST Sound ENGINE 86.3 62.9	318 2000 118-32 84-926 675 474 318 Pressure0016 ENGINE 116 84	91 90 92 88 90 88 86 85 ta (OB§F)	99 98 96 98 96 98 96 94 93 9 Dist 125	90 89 95 87 93 87 89 87 87 85 85 84	87 86 88 84 86 84 86 84 82 81 15 Mete	86 84 83 85 83 84 82 81 79 rs (7849 10006	85 84 82 86 82 84 82 80 79 .2 F cc t) 2000,5	80 79 88 77 86 77 79 77 75 74 72 4000 0	76 75 83 73 81 73 75 73 73 71 69 68 68 67 8000 66
600 ²⁰⁰ 500 ¹⁰⁰ 450 ⁰⁰⁰ 900 800 700 600 EXH ENGIN 50 SPEED RPM 1200	149193.0 86938.9 62890.4 503.3 353.5 236.8 AUST Sound ENGINE 86.3 POWER 86.9 POWER BKW 1.193.0	318 200 ⁰⁰⁰ 118 ² 32 84926 675 474 318 Pressur€00at ENGINE 116 84 POWER BHP 1.600	91 90 92 88 90 88 80 85 6 0VER 87 L DB(A) 94	99 98 100 96 98 96 98 94 93 9 Dist 125 89 HZ DB	90 89 95 87 87 87 87 87 85 84 85 84 250 80 HZ DB 95	87 86 84 84 86 84 86 84 84 82 81 15 Mete 500 78 HZ 77 HZ 77 DB 88	86 84 87 83 85 82 84 81 79 rs (7849 1000 6 HZ 6 DB 87	85 84 82 86 82 84 82 80 79 20076 HZ ⁷⁵ HZ 88	80 79 88 77 86 77 79 77 75 74 72 40007 HZ DB 88	76 75 83 73 81 73 75 73 73 71 69 68 800 67 800 67 HZ DB 83
600 ²⁰⁰ 500 ¹⁰⁰ 450 ⁰⁰⁰ 900 800 700 600 EXH ENGIN 50 SPEED RPM 1200 1100	149193.0 86938.9 62690.4 503.3 353.5 236.8 AUST Sound ENGINE 86.3 POWER 62.9 POWER BKW 1,193.0 918.9	318 20000 116232 84926 675 474 318 Pressure00at ENGINE 116 84 POWER 84 BHP 1.600 1.232	91 90 92 88 90 88 86 85 6 CVER 85 CVER 85 CVER 85 CVER 85 CVER 85 CVER 81 L 94 92	99 98 96 98 96 94 93 9 Dist 125 89 HZ DB 100 98	90 89 93 87 87 87 87 87 87 87 87 87 87	87 86 84 84 86 84 82 81 15 Mete 500 78 500 78 HZ 77 DB 88 88 86	86 84 83 85 82 84 82 81 79 79 78 9 78 9 78 9 1007 6 HZ DB 87 85	85 84 82 86 82 80 79 2000 79 2000 76 2000 75 HZ 75 BB 88 88 86	80 79 88 77 86 77 79 77 75 74 72 4000 HZ DB 88 88 86	76 75 83 73 81 73 75 73 73 71 69 68 80067 HZ DB 83 81
600 ²⁰⁰ 500 ¹⁰⁰ 450 ⁹⁰⁰ 800 700 600 EXH ENGINE SPEED RPM 1200 1100 1000	149193.0 86938.9 62690.4 503.3 353.5 236.8 AUST Sound ENGINE 86.3 POWER 86.3 POWER 86.3 1.193.0 918.9 690.4	318 2000 11€232 11€232 675 474 318 Pressure0at POWER BHP 1.600 1.232 926	91 90 92 88 90 88 86 86 85 ca (OB&F) OVER 87 L DB(A) 94 92 90	99 98 100 96 98 96 98 94 9 4 9 4 9 5 9 5 125 89 HZ DB 100 98 98	90 89 93 87 87 87 87 87 87 87 87 87 87 87 87 87	87 86 84 84 86 84 81 84 81 84 82 81 15 Mete 500 ⁷⁸ 500 ⁷⁸ 77 HZ DB 88 88 86 86	86 84 83 85 82 84 82 81 79 79 78 49 79 78 49 1000 76 HZ DB 87 85 84	85 84 82 86 82 84 82 80 79 2006 6 2006 79 2006 1 79 2006 1 79 2006 1 1 79 2006 1 1 1 1 1 1 1 1 1 1	80 79 88 77 86 77 79 77 75 74 72 4000 HZ DB 88 88 86 79	76 75 83 73 81 73 75 73 75 73 73 71 69 68 8000 66 HZ DB 83 81 75
600 ²⁰⁰ 500 ¹⁰⁰ 450 ⁹⁰⁰ 800 700 600 EXH . ENGIN 500 SPEED RPM 1200 1100 1000 900	149193.0 86938.9 62690.4 503.3 353.5 236.8 AUST Sound ENGINE 86.3 POWER 62.9 POWER 91.9 918.9 690.4 503.3	318 2000 116232 116232 675 474 318 Pressur€00at ENGINE BHP 1.600 1.232 926 675	91 90 94 88 90 88 80 85 86 85 6 CVER 87 DE (A) 94 92 90 88	99 98 100 96 98 96 98 94 93 9 Dist 12589 HZ DB 100 98 98 98	90 89 95 87 87 87 87 87 87 87 87 87 87	87 86 84 84 86 84 86 84 81 15 Mete 500 ⁷⁸ 500 ⁷⁸ HZ ⁷⁷ DB 88 88 86 86 86 84	86 84 83 85 82 84 82 81 79 79 1000 6 1000 6 HZ 6 DB 87 85 84 82	85 84 82 86 82 84 82 80 79 79 2000 75 HZ 70 P€ € 88 88 86 84 82	80 79 88 77 86 77 79 77 75 74 72 400070 HZ DB 88 88 86 79 77	76 75 83 73 81 73 75 73 73 71 69 68 8000 68 8000 66 HZ DB 83 81 75 73
600 ¹ 200 500 ¹ 00 450 ⁰ 000 900 800 700 600 EXH . ENGIN 500 SPEED RPM 1200 1100 1100 1000 900 800	149193.0 86938.9 62690.4 503.3 353.5 236.8 AUST Sound ENGINE 62.9 POWER BKW 1.193.0 918.9 690.4 503.3 353.5	318 2000 11632 84926 675 474 318 Pressur€00at ENGINE BHP 1.600 1.232 926 675 474	91 90 94 88 90 88 80 85 86 85 COVER 87 L DB(A) 94 92 90 88 88 86	99 98 100 96 98 96 98 94 93 9 Dist 12589 HZ DB 100 98 98 96 94	90 89 87 87 87 87 87 87 87 87 87 84 250 80 HZ 95 93 89 88 87 89 87 82 84 84 84 84 84 84 85 84 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 84 85 85 84 85 85 85 85 85 85 85 85 85 85	87 86 84 84 84 84 84 82 81 15 Meta 5007 77 HZ 77 DB 88 88 86 86 84 82	86 84 83 85 82 84 82 81 rs (78 49 1000 6 HZ 6 HZ 87 85 84 82 81	85 84 82 86 82 88 82 80 .2 F€€1 2000 ⁷⁵ HZ ⁷⁵ HZ ⁷⁵ HZ 88 88 86 84 82 80	80 79 88 77 86 77 79 77 75 74 72 4000 HZ DB 88 88 86 79 77 75	76 75 83 73 81 73 75 73 73 71 69 68 68 67 800 66 HZ DB 83 81 75 73 73 71
600 ¹ 200 500 ¹ 00 450 ⁰ 000 900 800 700 600 EXH . ENGIN 500 SPEED RPM 1200 1100 1200 1100 1000 900 800 700	149193.0 86938.9 62690.4 503.3 353.5 236.8 AUST Sound ENGINE 62.9 POWER BKW 1.193.0 918.9 690.4 503.3 353.5 236.8	318 2000 116232 116232 675 474 318 Pressur€00at ENGINE BHP 1.600 1.232 926 675	91 90 94 88 90 88 80 85 86 85 6 CVER 87 DE (A) 94 92 90 88	99 98 100 96 98 96 98 94 93 9 Dist 12589 HZ DB 100 98 98 98	90 89 95 87 87 87 87 87 87 87 87 87 87	87 86 84 84 86 84 86 84 81 15 Mete 500 ⁷⁸ 500 ⁷⁸ HZ ⁷⁷ DB 88 88 86 86 86 84	86 84 83 85 82 84 82 81 79 79 1000 6 1000 6 HZ 6 DB 87 85 84 82	85 84 82 86 82 84 82 80 79 79 2000 75 HZ 70 P€ € 88 88 86 84 82	80 79 88 77 86 77 79 77 75 74 72 400070 HZ DB 88 88 86 79 77	76 75 83 73 81 73 75 73 75 73 73 71 69 68 67 800 66 HZ DB 83 83 81 75 73 71 69
600 ¹ 200 500 ¹ 00 450 ⁰ 000 900 800 700 600 EXH . ENGIN 500 SPEED RPM 1200 1100 1100 1000 900 800	149193.0 86938.9 62690.4 503.3 353.5 236.8 AUST Sound ENGINE 62.9 POWER BKW 1.193.0 918.9 690.4 503.3 353.5	318 2000 118926 675 474 318 Pressur€09at ENGINE POWER BHP 1.600 1.232 926 675 474 318	91 90 94 92 88 90 88 86 85 cover8 f L 0 Ver8 f L 94 92 90 88 88 86 85	99 98 100 96 98 96 98 94 93 9 Dist 125 89 HZ DB 100 98 98 96 94 93	90 89 93 87 87 87 87 87 87 87 84 250 80 HZ 95 93 89 87 85 84	87 86 84 84 84 84 82 81 15 Mete 50078 HZ 77 HZ 77 DB 88 88 86 86 86 84 82 81	86 84 83 82 81 79 1000 6 HZ 6 HZ 6 HZ 7 87 85 84 82 81 79	85 84 82 80 79 2000 5 HZ 75 HZ 75 BB 88 86 84 82 80 79	80 79 88 77 86 77 79 77 75 74 72 4000 HZ DB 88 88 86 79 77 75 74	76 75 83 73 81 73 75 73 73 71 69 68 68 67 800 66 HZ DB 83 81 75 73 73 71

Satisfy in del: 357 (38.) 100 101 97 94 90 Rate (* power (* (* W))): % 200 95 52 Rating Love: B-RASING (FLAV/SDUTY) 99 96 95 92 93 90 94 91 83.5 64.74 99 96 95 92 93 90 94 91 97 94 91 97 94 91 97 94 91 97 94 91 90 93 90 93 90 93 90 93 90 93 90 91 90 91 90 91 90 91 90 93 90 90 93 90 93 90 93 90 93 90 90 93 90		Perfor	mance Numb	er: DM8731	Ch	ange Le	vel: 01					
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500 86.3 116 78 75 72 68 73 74 71 74	1100 1000 900 800 700 600 500	1100 1000 900 800 700 500 600 918.9 500 690.4 450 503.3 353.5 236.8 MEGHAN 86.3 ENGINE 62.9 SPEED RPM 1200 1100 1000 900 800	918.9 690.4 503.3 353.5 236.8 236.8 0149232 86926 62.9 62.9 62.9 62.9 62.9 62.9 62.9	1.232 926 675 474 8318 8200 8216 8216 8284 81 80 80 9 PresSure D 78 ENGINE POWER BHP 1.600 1.232 926 675 474	88 87 87 86 859 859 849 847 77 76 ata (OBCF) 75 OVERALL DB(A) 83 82 82 81 80	84 84 83 83 77 81 76 81 75 80 75 74 73 73 73 72 72 72 72 72 72 72 72 79 79 79 79 79 78 77 77	82 81 80 80 72 79 72 79 72 78 70 69 Distance: 68 68 68 250 HZ DB 77 76 75 75 75 74	77 76 76 77 75 77 74 75 75 74 73 75 74 73 73 73 73 73 73 73 73 73 73 73 73 73	82 82 81 81 78 79 77 76 76 75 5 5 5 5 5 5 6 76 75 75 75 75 75 77 77 77 77 77 75 75 75	83 83 82 81 75 81 74 80 74 80 74 80 74 80 74 79 72 72 72 72 72 72 72 72 72 72 72 72 72	80 80 79 78 78 77 78 77 76 76 76 76 75 74 4000 74 HZ DB 75 74 74 73 72	83 83 82 81 80 80 79 8000 HZ DB 78 78 78 78 78 76 76
450 62.9 84 78 75 72 68 73 73 70 74	1100 1000 900 800 700 600 500	1100 1000 900 800 700 500 600 918.9 500 690.4 450 503.3 353.5 236.8 MEGHA 86.3 ENGINE 62.9 SPEED RPM 1200 1100 1000 900 800 700 900 800 700 193.0 193.0 690.4 450 503.3 353.5 236.8 MEGHA 86.3 80.4 1000 1000 900 800 700	918.9 690.4 503.3 353.5 236.8 236.8 926 62926 675 474 318 NICAL Sound ENGINE 84 POWER 84 POWER 84 POWER 84 DOWER 918.9 1.193.0 918.9 690.4 503.3 353.5 236.8	1.232 926 675 474 318 8300 8216 8284 81 80 9 Pressure D 7 ENGIVE POWER BHP 1.600 1.232 926 675 474 318	88 87 87 86 859 859 849 847 77 76 ata (OBCF) ovF3ALL DB(A) 83 82 82 81 80 80 80	84 84 83 83 77 82 81 76 81 75 80 74 73 73 72 72 72 72 125 HZ DB 79 79 79 78 77 77 77 76	82 81 80 80 72 79 72 79 72 79 72 70 69 Distance: 68 68 68 68 250 HZ DB 77 76 75 75 74 73	77 76 76 77 75 77 74 73 75 75 74 73 73 73 73 73 73 73 73 73 73 73 73 73	82 82 81 78 79 77 76 75 5 5 5 5 5 6 75 75 74 73 1000 HZ DB 77 77 76 75 75 75 75 75 75 75 75 75 75 75 75 75	83 83 83 82 81 75 80 74 80 74 80 74 80 74 80 74 70 72 72 72 72 72 72 72 72 72 72 72 72 72	80 80 79 78 78 77 76 76 76 76 76 75 74 4000 HZ DB 75 74 74 74 73 72 72 72	83 83 82 81 80 80 79 8000 HZ DB 78 78 78 77 76 76 76 75
	1100 1000 900 800 700 600 500	1100 1000 900 800 700 918.9 500 690.4 503.3 353.5 236.8 MEGHAN SPEED RPM 1200 1100 1000 900 800 700 600	918.9 690.4 503.3 353.5 236.8 14.9232 86.926 62.92 67.5 474 318 NICAL Sound ENGINE 84 POWER BKW 1.193.0 918.9 690.4 503.3 353.5 236.8 149.1	1.232 926 675 474 318 8200 8216 8284 80 4 Pressure D ENGINE POWER BHP 1.600 1.232 926 675 474 318 200	88 87 87 86 859 849 849 849 848 877 77 76 ata (OBCF) 75 ovF5ALL DB(A) 83 82 82 81 80 80 80 79	84 83 83 77 82 76 81 75 80 74 73 73 73 73 72 72 72 72 72 72 72 72 72 72 72 73 73 73 73 73 73 73 73 73 73 73 73 73	82 81 80 79 72 79 72 79 72 79 70 69 Distance: 68 68 68 68 68 250 HZ DB 77 76 75 75 74 73 73 73	77 76 76 75 77 74 75 75 74 73 73 73 73 73 73 73 73 73 73 73 73 73	82 82 81 81 78 79 77 76 75 5 5 5 6 76 75 75 74 73 1000 HZ DB 77 77 76 75 75 75 75 75 75 75 75 75 75 75 75	83 83 83 82 81 75 80 74 80 74 80 74 80 74 70 72 72 72 72 72 72 72 72 72 72 72 72 72	80 80 79 78 78 77 78 76 76 76 76 76 76 76 76 76 76 76 76 76	83 83 82 81 80 80 79 8000 HZ DB 78 78 78 78 78 76 76 75 75

3/29/2011

	Perfor	mance Numb	er: DM8732	Ch	ange Le	vel: 01					
Sales Model:	35112268.0	1,700	114	119	114	107 Rate	d ⁰ Ŝneer	d (<u>(</u> R∰PM):	10,200	105	
1100		PROPULS	112	117	112	105 Dete	104 -	107	$\frac{105}{102}$ 68.0	103	
Application:				114	108		d Bowe				
Rating Level:					106	102 Rate			1 9,700	93	
800 700	375.7 251.7	504 338	106 105	110 109	104 103	100 99	99 98	102 101	95 94	91 89	
600		AUST Szolusno				Distance:			÷ ·	et 88	
500	017	123	102	· · ·	100	96	95	08	91	96	
450	ENGINE _{66.9}	ENGINE 90			₉₉ 125	95 250	94 500	97 1000	90 2000	86 4000	8000
	SPEED	POWER	POWER	55(4)	HZ	HZ	HZ	HZ	HZ	HZ	HZ
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1200	1.268.0	1.700	114	119 117	114 112	107 105	106 104	109 107	107 105	105
	1100 1000	976.7 733.8	1.310 984	112 110	117	108	105	104	107	99	103 95
	900	534.9	717	108	114	108	104	103	100	99 97	93
	800	375.7	504	106	110	104	100	99	104	95	91
1000	700	²⁵¹ 700	338		109	95 ¹⁰³	00	08	or 101	04	89
1200 1100	600,268.0 976.7		10100 9213 9122	1036	102103 100107 100106	95 93 101	95 97 93 97	95 96 93 96	95 99 93 99	90 94 88 92	88
1000	500 733 8	130310 917 9184		1025	96	og 100	01 96	01 95	86 98	82 91	86
900	450 534.9	66984 717	9720 9590	1057 1035 1065 1065 1063	94 ⁰ 105	91 99	89 ⁹⁵	89 ⁹⁴	80 97 84	80 ⁹⁰	86
800	375.7	504	93	101	92	89	88	87	82	78	
700	251.7	338	91	99	90	87	86	85	80	76	
600			d Pressoure Da			Distance:				et)5	
500	91.7 ENGINE _{66.9}				88 87 125	85 84 250	83 82 500	83 82 1000	78 77 2000	73 73 4000	8000
450	SPEED	POWER	POWER	OTBRALL	87 125 HZ	84 250 HZ	82 500 HZ	82 1000 HZ	77 2000 HZ	73 +000 HZ	HZ
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1200	BKW 1.268.0	BHP 1.700	101	DB 107	DB 102	DB 95	DB 95	DB 95	DB 95	DB 90
	1200 1100	BKW 1.268.0 976.7	BHP 1.700 1,310	101 99	DB 107 105	DB 102 100	DB 95 93	DB 95 93	DB 95 93	DB 95 93	DB 90 88
	1200 1100 1000	BKW 1.268.0 976.7 733.8	BHP 1.700 1.310 984	101 99 97	DB 107 105 105	DB 102 100 96	DB 95 93 93	DB 95 93 91	DB 95 93 91	DB 95 93 86	DB 90 88 82
	1200 1100 1000 900	BKW 1.268.0 976.7 733.8 534.9	BHP 1.700 1.310 984 717	101 99 97 95	DB 107 105 105 103	DB 102 100 96 94	DB 95 93 93 91	DB 95 93 91 89	DB 95 93 91 89	DB 95 93 86 84	DB 90 88 82 80
	1200 1100 1000 900 800 700	BKW 1.268.0 976.7 733.8 534.9 375.7	BHP 1.700 1.310 984 717 504	101 99 97 95 93	DB 107 105 105 103 101 99	DB 102 100 96 94 92 90	DB 95 93 93 91 89 87	DB 95 93 91 89 88 88	DB 95 93 91 89 87 85	DB 95 93 86 84 82 80	DB 90 88 82 80 78
1200	1200 1100 900 800 700,268.0	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.70	BHP 1.700 1.310 984 717 504	101 99 97 95 93	DB 107 105 105 103 101 99 99	DB 102 100 96 94 92 88 90 88 80	DB 95 93 93 91 89 88 87	DB 95 93 91 89 88 88 89 86 89	DB 95 93 91 89 87 88 85 88	DB 95 93 86 84 82 83 80 70	DB 90 88 82 80 78 78 76
1100	1200 1100 900 800 700,268.0 600,976.7	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.70	BHP 1.700 1.310 984 717 504 9388 9213 9213	101 99 97 95 93	DB 107 105 105 103 101 99 99 93 97	DB 102 100 96 94 92 88 89 86 89 86	DB 95 93 93 91 89 88 87 88 86 86 85	DB 95 93 91 89 88 88 86 89 86 87 84 87	DB 95 93 91 89 87 88 85 88 85 88 85	DB 95 93 86 84 82 83 79 81 78	DB 90 88 82 80 78
1100 1000	1200 1100 900 800 700,268.0 600,976.7 500,733.8	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 0 158.50 91.60	BHP 1.700 1.310 984 717 504 9388 9213 9213	101 99 97 95 93	DB 107 105 103 101 99 95 98 93 97 89 96	DB 102 100 96 94 92 88 90 88 89 86 88 86 88 86 88	DB 95 93 93 91 89 87 88 86 86 85 85	DB 95 93 91 89 88 88 88 88 86 87 83 84 82	DB 95 93 91 89 87 88 85 88 85 88 84 86 83 79 922	DB 95 93 86 84 82 83 80 83 79 81 75 75 77	DB 90 88 82 80 78 76 75
1100 1000 900	1200 1100 900 800 700,268.0 600,976.7 500,733.8 450,534.9	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 0 158.510 91.58.510 91.584 66.717	BHP 1.700 1.310 984 717 504 338 9713 9713 9723 9090 8890	101 99 97 95 93 91 101 989 888 888 886	DB 107 105 103 101 99 99 98 93 97 89 97 89 96 87	DB 102 100 96 94 92 88 90 86 89 86 88 86 88 84 87	DB 95 93 91 89 88 86 86 85 85 84 83	DB 95 93 91 89 88 86 87 84 83 84 82 82	DB 95 93 91 89 87 88 85 88 86 84 79 82 77	DB 95 93 86 84 82 83 79 81 78 75 77 77	DB 90 88 82 80 78 76 75 75 73
1100 1000	1200 1100 900 800 700,268.0 600,976.7 500,733.8	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 0 158.50 91.60	BHP 1.700 1.310 984 717 504 9388 9213 9213	101 99 97 95 93	DB 107 105 103 101 99 95 98 93 97 89 96	DB 102 100 96 94 92 88 90 88 89 86 88 86 88 86 88	DB 95 93 93 91 89 87 88 86 86 85 85	DB 95 93 91 89 88 88 88 88 86 87 83 84 82	DB 95 93 91 89 87 88 85 88 85 88 84 86 83 79 922	DB 95 93 86 84 82 83 80 83 79 81 75 75 77	DB 90 88 82 80 78 76 75 75 73
1100 1000 900 800	1200 1100 900 800 700 268.0 600 976.7 500 733.8 534.9 375.7 251.7	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 0 158500 91384 66717 504	BHP 1.700 1.310 984 717 504 9388 9213 9213 9223 9090 88 90 88 86 85 d Pres ŝure Da	101 99 97 95 93 91 101 999 888 888 888 886 94 93	DB 107 105 103 101 99 93 99 93 97 89 97 89 96 85 85 84	DB 102 100 96 94 92 88 90 88 89 86 88 86 88 86 88 87 82	DB 95 93 91 89 88 87 88 86 85 85 84 83 81	DB 95 93 91 89 88 86 87 84 87 83 84 82 82 80 79	DB 95 93 91 89 87 88 85 88 84 86 83 79 82 77 75	DB 95 93 86 84 82 83 79 81 78 75 77 73 71 70	DB 90 88 82 80 78 76 75 75 73
1100 1000 900 800 700 600	1200 1100 900 800 700 600 976.7 500 733.8 450 534.9 375.7 251.7 135757 145757	BKW 1.268.0 976.7 733.8 534.9 375.7 251.700 158.310 91.384 66.717 5044 66.717 338 AUST Source	BHP 1.700 1.310 984 717 504 9388 9213 9213 9223 9090 88 90 88 86 85 d Pres ŝure Da	101 99 97 95 93 91 90 888 888 886 94 93 94 93 94 93 94 93 94 93	DB 107 105 103 101 99 93 97 89 97 89 97 89 96 87 96 85 84 82 81	DB 102 100 96 94 92 88 90 86 89 86 88 84 87 81 Distance: 78 90	DB 95 93 91 89 88 86 86 85 85 84 83 81 79 78 15 M 76	DB 95 93 91 89 88 87 84 83 84 82 80 79 et ars (DB 95 93 91 89 87 88 85 84 86 83 79 82 77 75 74 49:2 Fee 71	DB 95 93 86 84 82 83 79 81 78 75 77 71 70 70 91 86 87	DB 90 88 82 80 78 76 75 73 73 73
1100 1000 900 800 700 600	1200 1100 900 800 700 268.0 600 976.7 500 733.8 534.9 375.7 251.7 15 E ★ H	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 158.50 91.94 66.94 66.94 66.94 504 338 AUST Source	BHP 1.700 1.310 984 717 504 9413 9713 9723 9090 886 866 85	101 99 97 95 93 91 101 999 888 888 888 886 94 93	DB 107 105 103 101 99 93 98 93 98 93 97 89 96 87 85 84 82	DB 102 100 96 94 92 88 89 86 89 86 88 86 88 84 87 82 81 Distance:	DB 95 93 91 89 88 87 86 86 85 85 85 85 85 84 83 81 79 78 15 M	DB 95 93 91 89 88 87 84 87 84 83 84 82 82 80 79 eters (DB 95 93 91 89 87 88 85 88 84 86 83 79 82 75 74 49:2 Fee	DB 95 93 86 84 82 83 79 81 78 75 77 77 71 70 71 70 98	DB 90 88 82 80 78 76 75 75 73
1100 1000 900 800 700 600	1200 1100 900 800 700 500 733.8 450 534.9 375.7 251.7 1582×H ENGINE ^{91.7} 66.9	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 0 158.50 91.384 66.717 504 338 AUST Sound ENGINE 123 90	BHP 1.700 1.310 984 717 504 338 9713 9723 90 223 90 88 86 85 d Pres Sture Da 82 ENGINE	101 99 97 95 93 91 90 888 888 886 94 93 94 93 94 93 94 93 94 93	DB 107 105 103 101 95 99 93 97 89 96 85 84 85 84 82 81 80 125	DB 102 100 96 92 88 89 86 89 86 88 86 88 84 87 82 81 Distance: 78 77 250	DB 95 93 93 91 89 88 86 86 85 85 85 84 83 81 79 78 5 00 76 500	DB 95 93 91 89 88 86 87 84 87 84 82 80 79 9 eters (76 75 1000	DB 95 93 91 89 87 88 85 88 84 86 83 79 82 75 74 49:2 Fee 71 70 2000	DB 95 93 86 84 82 83 79 81 75 73 77 71 70 71 70 71 70 66 4000	DB 90 88 82 80 78 76 75 73 73 73 8000
1100 1000 900 800 700 600	1200 1100 900 800 700 500 733.8 450 534.9 375.7 251.7 1521.7 1522.7 1522.7 91.7 SPEED	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 0 158.50 91.38 4 66.717 504 338 AUST Sound ENGINE 90 POWER	BHP 1.700 1.310 984 717 504 338 9413 9223 90 23 90 88 86 85 6 Pressure Da 82 ENGINE POWER	101 99 97 95 93 91 90 888 888 886 94 93 94 93 94 93 94 93 94 93 94 93 94 93 94 93 94 93 94 93 94 93 94 93 94 93	DB 107 105 103 101 95 98 93 97 89 96 85 84 85 84 82 81 80 125 HZ	DB 102 100 96 92 88 89 86 89 86 88 87 82 81 Disfemence: 78 77 250 HZ	DB 95 93 91 89 88 86 85 85 85 84 83 81 79 7815 M 76 500 HZ	DB 95 93 91 89 88 86 87 84 87 83 84 82 80 79 9 eters (76 75 1000 HZ	DB 95 93 91 89 87 88 85 88 84 86 83 79 82 75 74 4922 Fee 71 70 2000 HZ	DB 95 93 86 84 82 83 79 81 75 73 71 70 71 70 86 67 66 4000 67 84 80 80 75 73 71 70 71 70 71 70 71 70 71 70 71 70 71 70 71 70 71 70 80 80 80 80 80 80 80 80 80 80 80 80 80	DB 90 88 82 80 78 76 75 73 73 73 8000 HZ
1100 1000 900 800 700 600	1200 1100 900 800 700 268.0 600 976.7 500 73.8 534.9 375.7 251.7 13 EXH 91.7 ENGINE 66.9 SPEED RPM 1200 1100	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 0 158.50 91384 66717 504 338 AUST Solution ENGINE 90 POWER BKW 1.268.0 976.7	ВНР 1.700 1.310 984 717 504 94 338 97 23 90 23 90 23 90 86 85 d Pressure Da 82 ENGINE POWER ВНР 1.700 1.310	101 99 97 95 93 91 91 90 888 886 94 93 94 93 0VESALL DB(A) 94 92	DB 107 105 103 101 99 93 97 99 93 97 89 96 85 84 85 84 82 81 80 125 HZ DB 101 99	DB 102 100 96 94 92 88 89 86 88 87 82 81 Distance: 78 77 250 HZ DB 95 93	DB 93 93 91 89 87 86 86 85 85 84 83 81 79 78 5 M 76 76 500 HZ DB 88 88 88	DB 95 93 91 89 88 87 84 87 83 84 82 80 79 eters (76 75 1000 75 1000 88 88 88	DB 95 93 91 89 87 88 85 88 84 86 83 79 82 75 74 49:2 Fee 71 70 2000 HZ DB 89 87	DB 95 93 86 84 82 83 79 81 78 75 77 73 71 70 66 4000 HZ DB 88 88 86	DB 90 88 82 80 78 75 73 73 73 8000 HZ DB 83 83 81
1100 1000 900 800 700 600	1200 1100 900 800 700 268.0 600 976.7 500 976.7 534.9 375.7 251.7 13 EXH 91.7 ENGINE 66.9 SPEED RPM 1200 1100 1000	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 158.30 91.984 66.747 504 338 AUST Source ENGINE 90 POWER 90 POWER BKW 1.268.0 976.7 733.8	BHP 1.700 1.310 984 717 504 9213 9213 9223 9023 9090 886 85 d Pressure Da 82 ENGINE POWER BHP 1.700 1.310 984	101 99 97 95 93 91 90 888 888 888 886 94 93 ata (OBCF) 90 OVERALL DB(A) 94 92 90	DB 107 105 103 101 99 93 98 93 97 89 96 87 85 84 82 81 82 B1 125 HZ DB 101 99 98	DB 102 100 96 94 92 88 89 86 89 86 89 86 87 82 81 Distance: 78 77 250 HZ DB 95 93 89	DB 95 93 91 89 87 86 85 85 84 83 81 79 78 500 HZ DB 88 88 86 86 86	DB 95 93 91 89 88 87 83 84 82 80 79 eters (76 75 1000 HZ DB 88 86 85	DB 95 93 91 89 87 88 85 88 84 86 83 79 82 75 74 49:2 Fee 71 70 2000 HZ DB 89 87 84	DB 95 93 86 84 82 83 79 81 78 75 77 77 77 77 70 70 98 67 66 4000 67 66 4000 HZ DB 88 88 86 79	DB 90 88 82 80 78 75 73 73 73 73 8000 HZ DB 83 81 75
1100 1000 900 800 700 600	1200 1100 900 800 700 600 976.7 500 733.8 534.9 375.7 251.7 152XH ENGINE 66.9 SPEED RPM 1200 1100 1000 900	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 0 158.310 91.384 66.717 504 338 AUST Souga ENGINE 90 POWER BKW 1.268.0 976.7 733.8 534.9	BHP 1.700 1.310 984 717 504 338 9713 9723 9090 8890 86 85 d Pressure Da 82 ENGINE POWER BHP 1.700 1.310 984 717	101 99 97 95 93 91 101 90 888 88 896 94 93 0VERALL DB(A) 92 90 88	DB 107 105 103 101 95 99 97 99 97 99 97 87 96 85 84 82 81 125 HZ DB 101 99 98 96	DB 102 100 96 92 92 88 89 86 88 84 87 82 81 Distance: 78 77 250 HZ DB 95 93 89 87	DB 95 93 93 91 89 88 86 85 85 85 85 84 81 79 78 5 00 HZ DB 88 86 86 86 86 84	DB 95 93 91 89 88 86 87 84 82 80 79 eters (76 75 1000 75 1000 75 88 88 86 85 83	DB 95 93 91 89 87 88 85 86 84 85 86 83 77 75 74 75 74 75 74 75 74 75 74 70 2000 70 89 89 87 88 88 89 87 82 71 70 89 89 89 80 80 80 80 80 80 80 80 80 80 80 80 80	DB 95 93 86 84 82 83 80 75 75 77 71 70 75 73 71 70 66 4000 66 4000 66 HZ DB 88 88 86 79 77	DB 90 88 82 80 76 75 73 73 73 8000 HZ DB 83 81 75 73
1100 1000 900 800 700 600	1200 1100 900 800 700 600 976.7 534.9 375.7 251.7 15251.	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 0 158.50 91.384 66.717 504 338 AUST Sound ENGINE 90 POWER BKW 1.268.0 976.7 733.8 534.9 375.7	BHP 1.700 1.310 984 717 504 338 9713 9723 9023 9023 9090 88 85 d Pressure Da 82 ENGINE POWER BHP 1.700 1.310 984 717 504	101 99 97 95 93 91 90 888 886 94 93 876 94 93 876 94 93 0VEGALL DB(A) 94 92 90 88 88 86	DB 107 105 103 101 95 99 97 99 97 89 96 85 84 82 81 125 HZ DB 101 99 98 96 94	DB 102 100 96 92 92 88 89 86 88 84 87 82 81 Distemence: 77 250 HZ DB 95 93 89 87 85	DB 95 93 93 91 89 88 86 85 85 85 84 81 79 78 5 00 HZ DB 88 86 86 86 84 82	DB 95 93 91 89 88 86 87 84 82 80 79 eters (76 75 000 75 000 HZ DB 88 88 86 83 81	DB 95 93 91 89 87 88 85 86 83 77 82 75 74 49:2 75 74 49:2 70 2000 HZ DB 89 87 82 88 80	DB 95 93 86 84 82 83 75 75 77 71 70 75 66 4000 66 4000 HZ DB 88 88 86 79 77 75	DB 90 88 82 80 76 75 73 73 73 8000 HZ DB 83 81 75 73 73 71
1100 1000 900 800 700 600	1200 1100 900 800 700 500 733.8 450 534.9 375.7 251.7 1582×H P1.7 ENGINE 66.9 SPEED RPM 1200 1100 1000 900 800 700 800 700 91.7 120×10 100 100 100 100 100 100 100	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 0 158.50 91.984 66.717 504 338 AUST Sound ENGINE 90 POWER BKW 1.268.0 976.7 733.8 534.9 375.7 251.7	BHP 1.700 1.310 984 717 504 338 9713 9723 9023 9090 88 86 85 d Pressure Da 82 ENGINE POWER BHP 1.700 1.310 984 717 504 338	101 99 97 95 93 91 90 93 91 90 93 88 88 88 94 93 94 93 0V 87 88 88 0 V 87 90 0 V 87 90 94 92 90 88 88 86 85	DB 107 105 103 101 95 98 93 97 89 96 87 85 84 82 81 82 81 82 HZ DB 101 99 98 96 94 93	DB 102 100 96 94 92 88 89 86 88 87 82 81 Distance: 78 77 250 HZ DB 95 93 89 87 85 84	DB 93 93 91 89 88 86 85 85 84 83 81 79 78 5 00 HZ DB 88 86 86 86 86 86 84 82 81	DB 95 93 91 89 88 86 87 84 87 83 84 82 80 79 eters (76 75 1000 75 1000 HZ DB 88 88 86 85 83 81 79	DB 95 93 91 89 87 88 85 88 84 86 83 77 82 75 74 492 72 75 74 492 2000 HZ DB 89 87 84 80 79	DB 95 93 86 84 82 83 77 73 71 70 71 70 66 4000 HZ DB 88 88 86 79 77 75 74	DB 90 88 82 80 78 75 73 73 73 8000 HZ DB 83 81 75 73 71 70
1100 1000 900 800 700 600	1200 1100 900 800 700 600 976.7 534.9 375.7 251.7 152.8 PH. 1200 1100 1000 900 800 700 600	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 0 158.5 91.984 66.747 504 338 AUST Source 90 POWER BKW 1.268.0 976.7 733.8 534.9 90 90 90 90 90 90 90 90 90 9	BHP 1.700 1.310 984 717 504 338 9213 9223 9023 9090 86 85 d Presstire Da ENGINE POWER BHP 1.700 1.310 984 717 504 338 213	101 99 97 95 93 9101 90 888 886 94 93 ata (OBCF) OVESPALL DB(A) 94 92 90 88 86 85 83	DB 107 105 103 101 95 98 93 97 89 96 87 86 82 81 125 HZ DB 101 99 98 96 96 93 97 87 96 87 87 96 87 96 87 87 96 87 96 87 87 96 87 87 96 87 96 87 96 87 96 87 96 87 96 87 96 87 96 97 99 99 99 99 98 97 87 96 87 96 87 96 87 96 87 96 87 96 97 99 99 99 98 97 87 96 87 96 98 99 99 99 99 98 96 87 96 98 99 99 99 98 99 99 99 99 99	DB 102 100 96 94 92 90 88 89 88 87 82 81 Distance: 78 77 250 HZ DB 95 93 89 87 85 84 82	DB 93 93 91 89 87 88 86 85 85 84 83 81 79 78 5 00 HZ DB 88 88 86 86 86 86 84 82 81 79	DB 95 93 91 89 88 87 83 84 87 83 84 82 80 79 et <i>ars</i> (76 75 1000 HZ DB 88 88 86 85 83 81 79 78	DB 95 93 91 89 87 88 85 88 84 86 83 77 82 75 74 49:2 Fee 71 70 2000 HZ DB 89 87 84 80 79 77	DB 95 93 86 84 82 83 79 81 78 75 77 71 70 66 4000 HZ DB 88 88 86 79 77 75 74 72	DB 90 88 82 80 78 75 73 73 73 8000 HZ DB 83 81 75 73 71 70 68
1100 1000 900 800 700 600	1200 1100 900 800 700 500 733.8 450 534.9 375.7 251.7 1582×H P1.7 ENGINE 66.9 SPEED RPM 1200 1100 1000 900 800 700 800 700 91.7 120×10 100 100 100 100 100 100 100	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 0 158.50 91.984 66.717 504 338 AUST Sound ENGINE 90 POWER BKW 1.268.0 976.7 733.8 534.9 375.7 251.7	BHP 1.700 1.310 984 717 504 338 9713 9723 9023 9090 88 86 85 d Pressure Da 82 ENGINE POWER BHP 1.700 1.310 984 717 504 338	101 99 97 95 93 91 90 93 91 90 93 88 88 88 94 93 94 93 0V 87 88 88 0 V 87 90 0 V 87 90 94 92 90 88 88 86 85	DB 107 105 103 101 95 98 93 97 89 96 87 85 84 82 81 82 81 82 HZ DB 101 99 98 96 94 93	DB 102 100 96 94 92 88 89 86 88 87 82 81 Distance: 78 77 250 HZ DB 95 93 89 87 85 84	DB 93 93 91 89 88 86 85 85 84 83 81 79 78 5 00 HZ DB 88 86 86 86 86 86 84 82 81	DB 95 93 91 89 88 86 87 84 87 83 84 82 80 79 eters (76 75 1000 75 1000 HZ DB 88 88 86 85 83 81 79	DB 95 93 91 89 87 88 85 88 84 86 83 77 82 75 74 492 72 75 74 2000 HZ DB 89 87 84 80 79	DB 95 93 86 84 82 83 77 73 71 70 71 70 66 4000 HZ DB 88 88 86 79 77 75 74	DB 90 88 82 80 78 75 73 73 73 8000 HZ DB 83 81 75 73 71 70

Per	formance Numb	er: DM8732	Ch	ange Level:	01					
Sales Model: 351200	1,268.0	1,700	101	97	Rate	l Speed (I	2PM) 95 1	200 96	93	96
Application: MAR		1,310	100	96	Pated	Poweg (E	⁹⁴ 1	269 h ⁵	92	95
			99	96					91	95
Rating Level: C-RAT	(,	95		l Poweer (91	94
800 700	375.7 251.7	504 338	98 97	95 94	92 91	88 87	92 92	93 93	90 90	94 93
	IANICAL Some				ancen		ers (913.			92
E00	91.7	123	` 96	03	00	86	` 01	01	00	02
ENGINE50 SPEED	ENGINE 66.9 POWER	ENGINE 90 POWER	OVERĂĽ	125 ₉₂ HZ	250 ₉₀ нz	500 ₈₅ HZ	100090 HZ	200091 HZ	4000 ₈₈ HZ	800091 HZ
RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
1200	1.268.0	1.700	101	97	94	90	95	96	93	96
1100 1000	976.7 733.8	1,310 984	100 99	96 96	94 93	89 89	94 94	95 95	92 91	95 95
900	534.9	904 717	99 99	90 95	93 92	88	94 93	93 94	91 91	95 94
800	375.7	504	98	95	92	88	92	93	90	94
700 600 ¹ 200	251.7 158.268.0	³³⁸ 700 213	97 89	94 85	91 00 82	⁸⁷ 78	92 83	⁹³ 84	90 81	93 84
6001100	1000767	1-310	97 88	93 84	90 83	80 77	91 82	92 23	89 80	92 23
5001100 5001000	⁹¹ 733 8	123984	96 87	93 84	90 81	⁰⁰ 77	91 02	91 23	88 80	92 83
450 ₉₀₀	66,90.0 534.9	90 ⁰⁰¹ 717	96 87 87	92 83	90 81 80	85 76	90 81	91 83 82	88 79	91 82
800	375.7	504	86	83	80	76	81	81	78	82
700	251.7	338	85	82	79	75	80	81	78	81
	IANICAL Scelared	123 123 123	` 01	81011ST	anc e 9 78	7 Miete 74	` 70	.0 Feet)	70	80 80
500 ENGIN E 50 SPEED	ENGINE 91.7 66.9	ENGINE 90	OVER	125 ₈₀	250 78	500 ₇₃	79 1000 ₇₈	2000 79	4000 ₇₆	8000 ₇₉
JFEED	POWER	POWER		HZ	HZ	HZ	HZ	HZ	HZ	HZ
RPM	BKW	BHP	DB(A)	HZ DB	HZ DB	HZ DB	HZ DB	HZ DB	HZ DB	HZ DB
	BKW 1.268.0	BHP 1.700	89	DB 85	DB 82	DB 78				DB 84
RPM 1200 1100	BKW 1.268.0 976.7	BHP 1.700 1,310	89 88	DB 85 84	DB 82 82	DB 78 77	DB 83 82	DB 84 83	DB 81 80	DB 84 83
RPM 1200 1100 1000	BKW 1.268.0 976.7 733.8	BHP 1.700 1.310 984	89 88 87	DB 85 84 84	DB 82 82 81	DB 78 77 77	DB 83 82 82	DB 84 83 83	DB 81 80 80	DB 84 83 83
RPM 1200 1100 1000 900	BKW 1.268.0 976.7 733.8 534.9	BHP 1.700 1.310 984 717	89 88 87 87	DB 85 84 84 84 83	DB 82 82 81 80	DB 78 77 77 76	DB 83 82 82 81	DB 84 83 83 82	DB 81 80 80 79	DB 84 83 83 82
RPM 1200 1100 1000 900 800	BKW 1.268.0 976.7 733.8 534.9 375.7	BHP 1.700 1.310 984 717 504	89 88 87 87 86 85	DB 85 84 83 83 83	DB 82 82 81 80 80 79	DB 78 77 77 76 76 76 75	DB 83 82 82 81 81 81 80	DB 84 83 83 82 81 81	DB 81 80 80 79 78 78	DB 84 83 83 82 82 82 81
RPM 1200 1100 1000 900 800 700 200	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 15278.0	BHP 1.700 1.310 984 717 504 338 212700	89 88 87 87 86 85 85 85 83	DB 85 84 83 83 83 82 79	DB 82 81 80 80 79 70 77	DB 78 77 77 76 76 76 75 75 72	DB 83 82 82 81 81 81 80 77	DB 84 83 83 82 81 81 81 78	DB 81 80 80 79 78 78 78 78 77 75	DB 84 83 83 82 82 82 81 78
RPM 1200 1100 900 800 700 600 200 600 100	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.268.0 158676.7 91	BHP 1.700 1.310 984 717 504 338 213700 12310	89 88 87 87 86 85 85 85 83 85 82	DB 85 84 84 83 83 82 82 79 81 79 81 79	DB 82 82 81 80 80 79 77 79 77 79 76	DB 78 77 76 76 76 75 72 74 72	DB 83 82 81 81 80 79 77 79 77 79 77	DB 84 83 82 81 81 78 80 78	DB 81 80 79 78 78 78 77 75 76 74	DB 84 83 82 82 81 78 80 78
RPM 1200 1100 900 800 700 600 200 600 100	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 8076.7 91703.8	BHP 1.700 1.310 984 717 504 338 213700 213310 123 90984	89 88 87 87 86 85 85 83 85 82 84 82	DB 85 84 83 83 82 81 79 81 79 81 79 81 79	DB 82 82 81 80 80 79 77 79 76 78 76 78 75	DB 78 77 76 76 76 75 72 74 72 74 72 74 71	DB 83 82 81 81 80 77 79 77 79 77 79 77 79 77	DB 84 83 83 82 81 81 78 80 78 80 77	DB 81 80 79 78 78 77 78 77 74 76 74	DB 84 83 82 82 81 78 80 78 80 77
RPM 1200 1100 900 800 700 200 600 100 500 900 450 900	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 251.7 251.7 66.7 91.73.8 66.33.8 66.334.9	BHP 1.700 1.310 984 717 504 338 700 213310 123984	89 88 87 87 86 85 85 83 85 82 84 82	DB 85 84 83 83 83 82 79 81 79 81 78	DB 82 82 81 80 80 79 79 77 79 76 78 76	DB 78 77 77 76 76 76 75 74 72 74 72 74 71	DB 83 82 81 81 80 79 77 79 77 79 76 78 75	DB 84 83 83 82 81 81 78 80 78 80 77 79 76	DB 81 80 79 78 78 77 75 77 74 76 74 76 74 73	DB 84 83 83 82 82 81 78 80 78 80 77 79 76
RPM 1200 1100 900 800 700 600 200 600 100	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 8076.7 91703.8	BHP 1.700 1.310 984 717 504 338 700 219 310 123 984 90 717	89 88 87 87 86 85 83 85 82 84 82 84 82 84 81	DB 85 84 83 83 82 79 81 79 81 79 81 79 81 79 81 77 77 76	DB 82 81 80 80 79 79 77 76 78 75 75 74 73	DB 78 77 76 76 76 75 72 74 72 74 72 74 71 73 70	DB 83 82 82 81 81 80 77 79 77 79 76 75 74	DB 84 83 83 82 81 81 78 80 78 80 77 76 76 75	DB 81 80 80 79 78 77 75 77 74 76 74 76 74 73 72 72	DB 84 83 82 82 81 78 80 78 80 77
RPM 1200 1100 1000 900 800 700 200 600 100 500 100 500 000 450 900 800 700 MEICH	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 158.0 158.0 158.0 66.7 334.9 91.7 375.7 91.7 375.7 251.7 HANICAL Scouto	BHP 1.700 1.310 984 717 504 338 213700 213700 213700 123984 90717 504 338 Pressure Da	89 88 87 87 86 85 85 83 85 82 84 82 84 82 84 82 84 81 80 80	DB 85 84 83 83 82 79 81 79 81 78 80 77 77 76 7 7 7 7 5 5 7 9 1 7 7 1 1 7 1 1 1 1 1 1 1 1	DB 82 82 81 80 80 79 79 77 78 76 78 75 74 73 anc e 3	DB 78 77 76 76 75 74 72 74 72 74 72 74 72 74 71 73 70 70 69 15 Mete	DB 83 82 81 81 80 77 79 76 75 74 ers (7349	DB 84 83 83 82 81 78 80 78 80 77 76 76 76 75 .2 Feret)	DB 81 80 79 78 77 75 77 74 76 74 76 74 76 74 76 74 72 72 71	DB 84 83 83 82 82 81 78 80 78 80 78 80 77 76 76 75 75
RPM 1200 1100 1000 900 800 700 200 600 100 500 000 450 900 800 700 000 450 900 800 700 000 000 500 000 500 000 800 500 800 8	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 91.73.8 66.73.8 66.93.8 375.7 251.7 158.0 158.0 158.0 158.0 251.7 158.0 157.7 251.7 100 100 100 100 100 100 100 10	BHP 1.700 1.310 984 717 504 338 700 213310 123384 90 717 504 338 I Pressure Da ENGINE 123 90 90 123 123 123 123 123 123 123 123	89 88 87 87 86 85 85 83 85 82 84 82 84 82 84 82 84 81 80 80	DB 85 84 83 83 82 79 81 79 81 79 81 79 81 79 81 79 81 75 75 125 75	DB 82 82 81 80 79 79 77 78 76 78 75 74 73 ance32 250 72	DB 78 77 76 76 75 72 74 72 74 72 74 72 74 71 73 70 70 69 9 15 Mete 68 500 68	DB 83 82 81 81 80 77 79 77 79 77 77 77 77 77 76 75 75 74 9 73 100073	DB 84 83 83 82 81 81 81 78 80 78 80 78 80 77 76 76 75 76 76 75 .2 Feet) 74 2000/3	DB 81 80 80 79 78 77 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 77 74 76 75 74 76 75 74 76 75 74 76 74 76 74 76 73 72 72 72 72 72 72 72 72 72 72	DB 84 83 82 82 81 78 80 78 80 77 76 76 75 74 800074
RPM 1200 1100 1000 900 800 700 600 500 450 700 800 700 600 900 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 800 800 700 800 800 800 800	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 900 8 91.7 66.9 91.7 66.9 91.7 66.9 900 8 91.7 91	BHP 1.700 1.310 984 717 504 338 700 213 310 123 90 984 90 717 504 338 1Pressure 1 23 90 POWER 123 90	89 88 87 87 86 85 83 85 83 84 82 84 82 84 81 80 80 ta (OBØF) OVER ⁷⁸ OVER ⁷⁸	DB 85 84 83 83 82 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 75 80 77 76 76 76 76 76 76 76 76 76	DB 82 82 81 80 79 79 77 78 76 78 75 74 73 ance3 250 72 HZ	DB 78 77 76 76 75 72 74 72 74 72 74 72 74 72 74 71 73 70 70 69 15 Mete 500 68 68 HZ	DB 83 82 81 81 80 77 79 77 79 77 77 77 77 77 77	DB 84 83 83 82 81 81 78 80 78 80 78 80 78 80 78 80 77 76 76 75 .2 Feet) 74 2000/3 HZ	DB 81 80 79 78 77 75 76 74 76 74 76 74 76 74 72 72 71 400070 HZ	DB 84 83 82 82 81 78 80 78 80 77 76 75 75 75 74 800074 HZ
RPM 1200 1100 1000 900 800 700 600 500 450 900 800 700 600 900 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 800 800 700 800 800 800 800	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 91.7 375.7 91.7 66.9 91.7 91.	BHP 1.700 1.310 984 717 504 338 213310 90 717 504 384 90 717 504 338 90 717 504 338 I Pressure Date POWER BHP	89 88 87 87 86 85 83 85 83 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 81 80 80 80 80 80 80 80 80 80 80 80 80 80	DB 85 84 83 83 82 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 79 81 75 80 77 76 75 81 75 76 75 76 75 81 75 80 77 76 75 81 75 80 77 76 75 81 75 80 77 76 75 81 75 81 75 75 80 75 81 75 81 75 75 81 81 81 81 81 81 81 81 81 81	DB 82 82 81 80 79 79 77 78 76 78 75 74 73 ance ³ 72 HZ DB	DB 78 77 76 76 75 72 74 72 74 72 74 72 74 72 74 71 73 70 69 15 Mete 500 68 HZ DB	DB 83 82 81 81 80 77 79 77 79 77 77 77 77 77 77	DB 84 83 83 82 81 81 81 78 80 78 80 78 80 78 80 77 76 76 76 75 2000/4 HZ DB	DB 81 80 79 78 77 75 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 72 72 71 400 70 72 72 72 71 72 72 72 72 72 72 72 72 72 72	DB 84 83 83 82 81 78 80 78 80 77 76 75 75 75 74 800074 HZ DB
RPM 1200 1100 1000 900 800 700 600 500 450 700 800 700 600 900 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 800 800 700 800 800 800 800 <	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 900 8 91.7 66.9 91.7 66.9 91.7 66.9 900 8 91.7 91	BHP 1.700 1.310 984 717 504 338 700 213 310 123 90 984 90 717 504 338 1Pressure 1 23 90 POWER 123 90	89 88 87 87 86 85 83 85 83 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 81 80 80 80 80 80 80 80 81 85 83 85 83 85 83 85 82 84 84 80 80 80 80 80 80 80 80 80 80 80 80 80	DB 85 84 83 83 82 79 81 79 81 79 81 79 81 79 81 79 81 75 125 75 HZ	DB 82 82 81 80 79 79 77 78 76 78 75 74 73 ance3 250 72 HZ	DB 78 77 76 76 75 72 74 72 74 72 74 72 74 72 74 71 73 70 70 69 15 Mete 500 68 68 HZ	DB 83 82 81 81 80 77 79 77 79 77 77 77 77 77 77	DB 84 83 83 82 81 81 78 80 78 80 78 80 78 80 78 80 77 76 76 75 .2 Feet) 74 2000/3 HZ	DB 81 80 79 78 77 75 76 74 76 74 76 74 76 74 72 72 71 400070 HZ	DB 84 83 82 82 81 78 80 78 80 77 76 75 75 75 74 800074 HZ
RPM 1200 1100 1000 900 800 700 600 500 500 800 700 600 900 800 700 450 900 800 700 MECOH 500 ENGINES SPEED RPM 1200	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 268.0 158.0 158.0 158.0 158.0 158.0 1.268.0 91.7 66.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 91.7 60.9 90.0 9	BHP 1.700 1.310 984 717 504 338 213700 213310 123310 909717 504 338 Pressur ₽123 90 POWER 123 90 POWER BHP 1.700	89 88 87 87 86 85 83 85 83 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 82 84 81 80 80 80 80 80 80 80 80 80 80 80 80 80	DB 85 84 83 83 82 79 81 79 81 77 76 77 76 75 12575 HZ DB 79	DB 82 82 81 80 79 77 78 76 78 76 75 74 73 ance3 250 72 HZ DB 77	DB 78 77 76 76 75 72 74 72 74 72 74 72 74 71 73 70 70 69 15 Mete 500 68 HZ DB 72	DB 83 82 82 81 81 80 77 79 76 75 75 74 75 75 74 976 75 75 74 977 75 74 977 75 74 977 75 74 977 75 74 977 75 75 74 977 75 75 74 977 75 75 74 977 75 75 74 977 75 75 74 977 75 75 74 977 75 75 74 977 75 75 74 977 75 75 75 75 75 75 74 977 75 75 75 75 75 75 75 75 75	DB 84 83 83 82 81 81 78 80 78 79 76 76 75 76 75 76 76 75 76 76 75 76 76 75 2000 74 2000 74 DB 78	DB 81 80 79 78 78 77 75 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 76 72 72 71 400 70 72 72 71 75 75 75 75 75 75 75 75 75 74 76 74 76 75 75 75 75 75 75 75 76 74 76 76 72 72 72 71 72 72 72 71 72 72 72 71 72 72 72 71 75 72 72 72 71 72 72 71 75 72 72 71 72 72 71 72 72 71 72 72 71 72 72 71 71 70 72 72 71 71 70 71 72 72 71 71 71 70 72 72 71 71 70 71 70 72 72 71 71 70 71 70 71 70 71 70 71 70 71 70 71 70 71 70 71 70 71 70 71 70 71 70 71 70 70 71 70 70 71 70 70 71 70 70 71 70 70 70 71 70 70 70 71 70 70 70 70 70 70 70 70 70 70	DB 84 83 83 82 82 81 78 80 77 76 76 75 75 75 74 8009 4 HZ DB 78
RPM 1200 1100 1000 900 800 700 600 500 800 700 600 900 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 800 700 800 700 800 700 800 700 800 700 800 800 800 800 800 900 800 800 800 800 800 800 800 <	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 251.7 91.76.8 66.9 91.76 251.7 2	BHP 1.700 1.310 984 717 504 338 700 21 310 123 984 90 717 504 338 I Pressur⊭ Da ENGINE 8HP 1.700 1.310 984 717	89 88 87 87 87 86 85 83 84 82 84 81 80 ta (OBCF) 78 OVERAS L DB(A) 83 82 82 81	DB 85 84 84 83 83 82 79 81 79 81 79 77 76 75 125 75 125 75 HZ DB 79 79 79 79 79 79 77 77 76 77 77 76 77 77 76 77 77	DB 82 82 81 80 79 79 77 76 75 74 73 250 72 250 72 HZ DB 77 75 75 75 75 75 75 75 75 75	DB 78 77 76 76 75 72 74 72 74 71 73 70 70 69 15 Mete 500 68 500 68 HZ DB 72 72 71 70	DB 83 82 81 81 80 79 77 79 76 75 75 74 9 73 1000 73 1000 73 HZ DB 77 77 76 75 75 75 75 75 75 75 75 75 75	DB 84 83 83 82 81 81 80 78 80 77 79 76 76 75 76 74 2000 73 HZ DB 78 78 78 78 78 77 76 76 77 76 76 77 76 76 77 76 76	DB 81 80 80 79 78 77 75 74 76 74 76 74 76 74 76 74 72 72 71 4000 70 HZ DB 75 74 75 74 71 400 70 HZ 75 74 75 74 71 71 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 75 74 75 75 74 75 75 75 75 75 74 75 75 75 75 75 75 75 75 75 75	DB 84 83 83 82 82 81 78 80 77 79 76 75 74 8000 74 HZ DB 78 78 78 78 78 78 77 76
RPM 1200 1100 1000 900 800 700,200 600,100 500,000 450,900 800 700 MECH 500 ENGINES SPEED RPM 1200 1100 900 800	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 251.7 91.73.8 66.9 91.7 25	BHP 1.700 1.310 984 717 504 338 700 213 310 123 90 717 504 338 I Pressur∉ Da ENGINE 90 POWER BHP 1.700 1.310 984 717 504	89 88 87 87 87 86 85 83 84 82 84 82 84 82 84 81 80 ta (OBCF) OVER75 OVER75 OVER75 83 82 81 80	DB 85 84 83 83 82 79 81 79 81 79 81 79 81 79 77 76 75 125 75 125 75 125 75 125 75 125 75 125 75 125 75 125 75 125 75 125 75 125 75 77 77 77 77 76 75 75 77 77 77 75 75 75 77 77	DB 82 82 81 80 79 79 77 78 75 74 73 80 75 74 72 250 72 HZ DB 75 75 75 75 75 75 75 75 75 75	DB 78 77 76 76 75 72 74 72 74 72 74 71 70 69 69 68 500 68 500 68 HZ DB 72 72 71 70 70 70 69 70 70 70 70 70 70 70 70 70 70 70 70 70	DB 83 82 81 81 80 79 77 79 77 76 73 1000 73 HZ DB 77 76 75 75 75 75 75 75 75 75 75 75	DB 84 83 83 82 81 81 80 78 80 78 79 76 76 76 77 76 76 76 77 76 76	DB 81 80 79 78 77 74 76 74 76 74 76 74 76 74 72 72 71 4000 70 HZ DB 75 74 75 74 73 75 74 73 75 74 76 74 75 74 75 74 75 76 74 75 75 74 75 75 74 75 74 75 75 74 75 75 74 75 75 74 75 75 75 74 75 71 71 75 74 75 71 71 75 75 74 71 75 74 75 74 71 75 74	DB 84 83 82 82 81 78 80 78 76 75 74 800074 HZ DB 78 78 78 78 77 76 76 76 76 77 76 76 76 77 76 76
RPM 1200 1100 1000 900 800 700 600 500 500 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 91.7 375.7 251.7 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 63.8 534.9 375.7 251.7 1.268.0 976.7 733.8 534.9 375.7 251.7 2	BHP 1.700 1.310 984 717 504 338 700 213 310 90 717 504 338 Pressur⊭ Da Power BHP 1.700 1.310 984 717 504 338 Power BHP	89 88 87 87 86 85 83 85 84 82 84 82 84 82 84 80 80 ta (OBØF) OVER A 83 82 82 81 80 80 80 82 83 83 83 84 80 80 80 80 80 80 80 80 80 80	DB 85 84 83 83 82 79 81 79 81 79 81 79 77 76 75 125 75 HZ DB 79 79 79 79 79 79 79 77 76 77 77 76 75 125 75 HZ DB	DB 82 82 81 80 79 77 78 76 75 77 76 75 74 73 75 74 75 75 74 75 75 74 75 75 74 75 75 77 76 75 77 76 77 76 76 75 72 72 72 72 72 72 72 74 73 75 75 74 75 75 72 72 72 74 73 75 74 75 75 74 75 72 72 72 72 74 75 75 75 75 75 72 72 72 72 72 74 75 75 75 75 75 75 75 75 75 75	DB 78 77 76 76 75 72 74 72 74 72 74 71 73 70 69 15 Mete 500 68 68 HZ DB 72 72 71 70 70 69	DB 83 82 81 81 80 77 79 77 77 76 75 74 9 76 75 74 1000 73 HZ DB 77 77 76 75 75 74 77 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 75 74 75 75 74 77 77 76 75 75 74 75 75 74 75 75 75 74 77 77 75 75 75 74 77 77 75 75 75 74 75 75 75 75 75 74 75 75 75 75 74 75 75 75 75 75 74 75 75 75 75 75 74 75 75 75 75 75 75 75 75 75 75	DB 84 83 83 82 81 81 81 78 80 78 76 76 76 76 76 76 76 76 76 76	DB 81 80 79 78 78 77 75 74 76 74 76 74 76 74 76 74 76 74 76 74 76 74 75 74 76 74 75 75 74 75 74 75 74 75 75 74 75 75 74 71 70 71 71 75 74 71 71 75 74 71 71 75 74 71 71 75 74 71 75 74 71 71 75 74 71 75 74 75 74 71 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 73 72 72 72 72 72 72 72 72 72 72	DB 84 83 82 82 81 78 80 78 76 75 74 800074 HZ DB 78 78 77 76 76 75 75 75 74 800074 HZ DB
RPM 1200 1100 1000 900 800 700 600 500 500 800 700 600 900 800 700 900 800 700 MECOL 500 ENGINES SPEED RPM 1200 1100 900 800 700 600	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 91.76.7 91.76.7 91.76.7 91.77 251.7 ANICAL SUBSTO POWER BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 1.268.0 97.7 3.4.9 3.75.7 251.7 1.268.0 97.7 1.268.0 97.7 251.7 1.258.0 91.7 60.9 91.7 70.7 7	BHP 1.700 1.310 984 717 504 338 213700 213 90 9717 504 338 Pressur ₽ Da Power BHP 1.700 1.310 984 717 504 338 213	89 88 87 87 86 85 83 85 84 82 84 82 84 82 84 81 80 80 CVER A L DB(A) 83 82 82 81 80 80 79	DB 85 84 83 83 82 79 81 79 81 77 76 75 125 75 125 75 125 75 125 75 125 75 125 75 77 76 77 76 77 76 77 77 76 77 77	DB 82 82 81 80 79 77 77 76 75 74 73 ance3 72 250 72 HZ DB 77 76 75 75 74 73 77 76 75 75 74 77 76 75 75 74 73 77 76 75 75 74 73 75 75 74 75 75 72 74 73 75 75 74 73 75 75 74 75 75 74 75 75 72 72 74 73 75 75 75 75 75 75 75 75 75 75	DB 78 77 76 76 75 72 74 72 74 72 74 70 69 15 Mete 500 68 500 68 500 68 HZ 72 72 71 70 70 69 HZ 72 72 71 70 70 69 HZ 72 72 72 71 70 70 69 15 72 70 70 70 70 70 69 70 70 70 70 70 70 70 70 70 70 70 70 70	DB 83 82 82 81 81 80 77 79 76 75 74 73 1000 73 1000 73 HZ DB 77 76 75 75 74 73 100 73 100 73 100 73 100 73 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 74 77 77 76 75 75 74 77 77 77 75 75 74 75 75 74 75 75 74 75 75 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 75 74 75 75 75 74 75 75 75 74 75 75 75 74 75 75 75 74 75 75 75 74 75 75 75 74 75 75 74 75 75 75 74 75 75 75 74 75 75 75 74 75 75 75 74 75 75 75 74 75 75 75 75 74 75 75 75 74 75 75 75 75 74 75 75 75 75 75 75 75 75 75 75	DB 84 83 83 82 81 81 80 78 79 76 76 75 74 2000 74 2000 74 2000 74 2000 74 75 76 76 75 76 76 75 74 2000 74 2000 73 76 76 75 74 2000 73 76 76 75 74 2000 74 75 76 76 75 76 76 75 76 76 75 76 76 76 75 76 76 76 76 76 75 76 76 76 76 76 75 76 76 76 76 76 76 76 76 76 76	DB 81 80 80 79 78 78 77 75 74 76 74 70 72 72 71 400070 HZ DB 75 74 74 73 72 72 71 72 72 71 40070 HZ DB	DB 84 83 83 82 82 81 78 80 78 76 75 75 74 800974 HZ DB 78 78 77 76 75 75 75 75 75 75 75 75 75 75
RPM 1200 1100 1000 900 800 700 600 500 500 800 700 800 700 800 700 800 700 800 700 800 700 800 700 800 700	BKW 1.268.0 976.7 733.8 534.9 375.7 251.7 251.7 91.7 375.7 251.7 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 66.9 91.7 63.8 534.9 375.7 251.7 1.268.0 976.7 733.8 534.9 375.7 251.7 2	BHP 1.700 1.310 984 717 504 338 700 213 310 90 717 504 338 Pressur⊭ Da Power BHP 1.700 1.310 984 717 504 338	89 88 87 87 86 85 83 85 84 82 84 82 84 82 84 80 80 ta (OBØF) OVER A 83 82 82 81 80 80 80 82 83 83 83 84 80 80 80 80 80 80 80 80 80 80	DB 85 84 83 83 82 79 81 79 81 79 81 79 77 76 75 125 75 HZ DB 79 79 79 79 79 79 79 77 76 77 77 76 75 125 75 HZ DB	DB 82 82 81 80 79 77 78 76 75 77 76 75 74 73 75 74 75 75 74 75 75 74 75 75 74 75 75 77 76 75 77 76 77 76 76 75 72 72 72 72 72 72 72 74 73 75 75 74 75 75 72 72 72 74 73 75 74 75 75 74 75 72 72 72 72 74 75 75 75 75 75 72 72 72 72 72 74 75 75 75 75 75 75 75 75 75 75	DB 78 77 76 76 75 72 74 72 74 72 74 71 73 70 69 15 Mete 500 68 68 HZ DB 72 72 71 70 70 69	DB 83 82 81 81 80 77 79 77 77 76 75 74 9 76 75 74 1000 73 HZ DB 77 77 76 75 75 74 77 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 74 75 75 75 74 75 75 74 77 77 76 75 75 74 75 75 74 75 75 75 74 77 77 75 75 75 74 77 77 75 75 75 74 75 75 75 75 75 74 75 75 75 75 74 75 75 75 75 75 74 75 75 75 75 75 74 75 75 75 75 75 75 75 75 75 75	DB 84 83 83 82 81 81 81 78 80 78 76 76 76 76 76 76 76 76 76 76	DB 81 80 79 78 78 77 74 76 74 76 74 76 74 76 74 76 74 76 74 75 74 76 74 75 75 74 75 75 74 71 71 70 71 71 71 75 74 71 71 75 74 71 75 74 71 75 74 71 75 74 71 75 74 71 71 75 74 75 74 71 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 75 74 73 72 72 72 72 72 72 72 72 72 72	DB 84 83 82 82 81 78 80 78 76 75 74 800074 HZ DB 78 78 77 76 76 75 75 75 74 800074 HZ DB

Data Date: 3/29/2011

	Perform	nance Numbe	r: DM8964	Ch	ange Level:	00					
Sales Model:	3511200	1,250.0	1,676	114	119	Rater	l Speled (RPM) ^{1:06} 1,0	600107	108	105
Application:			1,381	113	118	Pated		3KW) ¹⁰⁴ 1,2	250 ¹⁰⁶	106	103
Rating Level:		(INDEGTON)			116	Dete		BHP)r01 1,0	676 JOA	105	102
Rating Level:	1200	527.3	707	108	115 113	108	u Powięs (101	י, י 100 100	103	103 101	101 99
	1100	406.2	545	108	113	103	100	98	103	101	99 98
		AUST Sound				ance ₀₄	1.5 Mete			95	90
1	900 ENGINE0	ENGINE 222.5 156.3	ENGINE 298 210	overau	125 108	250 ¹⁰²	500 98 97	100_{96}^{97}	200099	400_{92}^{93}	800088 800088
	SPEED	POWER _{104.7}	POWER 140	102	нz ₁₀₆	нz ₁₀₀	нz ₉₆	HZ ₉₅	HZ ₉₈	нz ₉₁	нz ₈₇
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600 1500	1.250.0 1,030.0	1.676 1,381	114	119	115	107 106	106 104	107 106	108 106	105 103
	1400	837.4	1,123	113 111	118 116	113 112	100	104	100	105	103
	1300	670.5	899	110	115	110	104	100	104	103	101
	1200	527.3	707	108	113	108	101	100	103	101	99
	1100	406.2	545	107	112	107	100	98	101	100	98
	1000	305.2 21,2250.0	409	106,01	110,108	104	100 93	99 97 93	102 100 94 99 92	95 95	90 90
	1000 900 900 500	22250.0 156030.0	409 298676 210381 210123	106 104 ¹⁰¹ 103 ⁹⁹ 103 ⁹⁸	110 108 ¹⁰⁸ 107 ¹⁰⁷	104 102 ¹⁰²	98 93 97 92		100 92	93 93 92 93	89 ⁹⁰ 88 88
	0001400		210001 10123 140200	103_{98}^{102}		101 99		96 90 95 90	99 0 <u>2</u> 00 91	92 00 01 91	88 80 87 87
	700400 1300	104 <mark>677.4</mark> 670.5	140 899	102 96	107 106 105 103	102 101 ¹⁰¹ 100 ⁹⁹ 100 ⁹⁷	96 90 90	95 90	98 91 91	91 91 90	87 85
	1200	527.3	707	95	101	96	89	89	89	89	84
	1100	406.2	545	93	100	94	87	87	88	87	82
		AUST Scorenzed		· · ·		ancei	7 Maete	•) Feet)	81	77
1	ENGINE	ENGINE 222.5 156.3	ENGINE 298 210	overall	125 ₉₈	250 90	500 87 86	1000 ⁸⁵ 100084	2000 ⁸⁵ 200084	4000 79	8000 ⁷⁶
	SPEED	POWER _{104.7}	POWER 140	90 89	HZ ₉₇	нz ₈₈	нz ₈₅	HZ ₈₃	нz ₈₃	HZ ₇₈	HZ_{74}^{75}
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1,250.0	1,676	101	108	102	93	93	94	95	90
	1500	1.030.0	1.381	99	107	101	92	91	92	93	88
	1400	837.4	1,123	98	105	99	90	90	91	91	87
	1300 1200	670.5 527.3	899 707	96 95	103 101	97 96	90 89	90 89	91 89	90 89	85 84
	1100	406.2	545	93	100	90 94	87	87	88	87	82
	1000	305.2	400	92	100	. .	88		86	81	77
	1600	305.2 22250.0 156837.4 10487.5	-1-676	91 ⁹⁴	102	96	87 87	- 86	85 ⁸⁷	80 88	76 ⁸³
	800 D08	156,37,4		90 93	00100	90 90 89 94 93	86 85		84 86 84 84	79 86	75 82
	700 ⁴⁰⁰ 1300	104 ^{077.4} 670.5	210 ⁻⁰¹ 140 ¹²³ 899	89 91 89 90	98 99 97 99 96	89 93 88 93 91	85 84 85 84	84 83 83 83 83	83 84 84	79 85 78 85 84	75 80 74 80 79
	1200	527.3	707	88	95	89	82	82	83	82	77
	1100	406.2	545	87	93	88	81	81	81	81	76
		AUST Scound				ance5	15 Mete		2 Feet)	75	70
I	ENGINE	ENGINE 222.5 156.3	ENGINE 298 210	OVER	125 ₉₁	250 ⁸³ 82	500 79	1000 ₇₉	20097 20097	4000 ₇₃	8000 ⁶⁹
	SPEED	POWER _{104.7}	POWER 140	82	н z ₉₀	нz ₈₁	HZ ₇₈	HZ ₇₇	н z ₇₆	HZ ₇₁	н 2 67 DB
	RPM 1600	BKW 1,250.0	BHP 1,676	DB(A) 94	DB 102	DB 96	DB 87	DB 86	DB 87	DB 88	83
	1500	1.030.0	1.381	93	102	90 94	85	85	86	86	82
	1400	837.4	1,123	91	99	93	84	83	84	85	80
	1300	670.5	899	90	96	91	84	83	84	84	79
	1200	527.3	707	88	95	89	82	82	83	82	77
	1100	406.2	545	87	93	88	81	81	81	81	76
	1000	305.2	409	86	94	85	82	80	80	75	70
	900	222.5	298 210	84 83	92 91	83 82	80 79	79 78	78 77	73 72	69 68
	800	156.3	210	83	u 1	×/			//		na
	700	104.7	140	82	90	81	78	77	76	71	67

	Perform	ance Numbe	r: DM8964	Ch	ange Level:	00					
Sales Model:	3511000	1,250.0	1,676	103	99	Raigd	Sneed (I	PPM \-98 1	600 98	96	100
Application:			1,381	102	98	Poted	94 Dowor (F	RPM):⁹⁸ 1 3KW):97 1	250 d ⁷	95	99
			1,123	102	97					95	98
Rating Level:	· ·			,	98		•	BHP):96 1		93	97
	1200 1100	527.3 406.2	707 545	101 100	97 96	94 94	90 89	95 94	96 95	93 92	96 95
			Pressure			ance	1 Meete			91	95
	900	NGINE 222.5 156.3	298	99	405 ⁹⁵	92	500 ⁸⁸	· ^ ^	04	91	94
El	NGINEOO E PEEPOO I	POWER 156.3	ENGINE 210 POWER 140	OVERĂĽ	125 ₉₅	250 ₉₂ 17	500 ⁰⁰ 88	1000 ₉₂ HZ ₉₂	2000 ₉₃ HZ ₉₃	4000 ₉₀ HZ 90	8000 ₉₄
	RPM	BKW	BHP	97 DB(A)	HZ 94 DB	HZ 91 DB	HZ 87 DB	DB	DB	DB	HZ 93 DB
	1600	1.250.0	1.676	103	99	98	95	98	98	96	100
	1500	1,030.0	1,381	103	98	97	94	97	97	95	99
	1400	837.4	1,123	102	97	96	93	96	97	95	98
	1300	670.5	899	101	98	95	91	96	96	93	97
	1200	527.3	707	101	97	94	90	95	96	93	96
	1100	406.2	545	100 99	96 96	94 93	89 89	94 94	95 95	92 91	95 95
	1000 9001600	305.2 227.5	409 298 281	aa ⁹¹	o5 8/	02 86	₆₀ 83	02 86	04 86	01 84	ο ⁴ 88
	8001500	156.330.0	21000	98 90	95 ⁸⁶	02 85	88 82	02 85	03 82	an 83	94 ⁸⁷
	700 ¹⁴⁰⁰ 1300	104,837.4 104,670.5	140 ²¹⁹ 899	97 90 97 89	94 85 86	92 84 91 83	87 81 87 79	92 84 92 84	93 85 85	90 83 90 81	93 87 85
	1200	527.3	707	89	85	82	78	83	84	81	84
	1100	406.2	545	88	84	82	77	82	83	80	83
	MECHANIC		Pressure4@at	· · ·		ance:1	7 Mræte	•		80	83
EI	900 NGINE00 E	ENGINE 222.5 156.3	ENGINE 298 210	over&5	125 ⁸³ 83	250 ₈₀	500 ⁷⁶ 76	81 1000 ₈₁	2000 ₈₁	79 4000 ₇₈	8000 ₈₂
S	PEEP ₀₀ I	POWER 104.7	POWER 140	85	HZ 82	HZ 79	HZ 75	HZ 80	HZ 81	HZ 78	HZ 81
	RPM	BKW	внр	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1,250.0	1,676	91	87	86	83	86	86	84	88
	1500	1.030.0	1.381	90	86 85	85	82	85	85 85	83	87 87
	1400 1300	837.4 670.5	1,123 899	90 89	85 86	84 83	81 79	84 84	85 85	83 81	87 85
	1200	527.3	707	89	85	82	78	83	84	81	84
	1100	406.2	545	88	84	82	77	82	83	80	83
	1000 900	305.2 227,250.0	409 1 676	87 85	84 81	81 80 80	77 77	82 80	83 80	⁸⁰ 78	⁸³ 82
	900 1500 800	<u></u>	409 298 31 381	8/ 85	83 80	80 70	^{/0} 76	81 70	82 80	⁷⁹ 78	82 81
	8001500 8001400 7004000	156,337.4	210 140 140	86 84 85 84	83 80 82 80	80 70 79	$\frac{76}{75}$ 76	⁸¹ 79	81 01 79	$\frac{78}{70}$ 77	82 81 81 70
	1300	104,77.4 670.5	899	83	80	11	73	78	79	76	79
	1200	527.3	707	83	79 79	77	72	77	78	75 74	78
	1100 MECHANIC	406.2 CAL Source	545 Pressure4@Dat	82 ta (OB@₽)		76 ance?.5	72 15 Mrete	77 ers (7649)	78 .2 Fe7ert)	74 74	78 77
_		222.5	298	01	125 ₇₇	250 ₇₄	500 ⁷⁰ ₇₀	1000 ₇₅	2000 76	4000 ₇₂	76
EI	NGINE E	INGINE 156.3	ENGINE 210	overåu		250 ₇₄	500 ₇₀	1000 ₇₅	2000 ₇₆	4000 ₇₂	8000 ₇₆
		104.1	POWER 140	80	HZ 76	HZ 73	HZ 69	HZ 74	HZ 75	HZ 72	HZ 75
	RPM 1600	BKW 1,250.0	BHP 1,676	DB(A) 85	DB 81	DB 80	DB 77	DB 80	DB 80	DB 78	DB 82
	1500	1.250.0	1.381	85	80	80 79	76	80 79	80 80	78 78	82 81
	1400	837.4	1,123	84	80	79	76	79	79	77	81
	1300	670.5	899	83	80	77	73	78	79	76	79
	1200	527.3	707	83	79	77	72	77	78	75	78
	1100 1000	406.2 305.2	545 409	82 82	79 78	76 75	72 71	77 76	78 77	74 74	78 77
	900	305.2 222.5	409 298	82 81	78 77	75 75	70	76 75	76	74 73	76
	800	156.3	210	80	77	74	70	75	76	72	76
	700	104.7	140	80	76	73	69	74	75	72	75

	Perfo	rmance Numbe	r: DM8965	Cł	nange Level:	00					
Sales Model:	35110600	1,305.0	1,750	115	120	Rátlád	Snod 98(PDM\1061	300 108	108	105
Application:			1,442	113	118			RPM) ¹⁰⁶ 1,0 3KW) ¹⁰⁴ 1,3	205 ¹⁰⁶	107	103
		0 _	1,172	111	116	Rateo	Powerat	5 (vv) ₁₀₃ (,	505. ₁₀₄	105	102
Rating Level:		G (HEAVY7DOUDT)	,	110	115			BHP)1011,		103	101
	1200 1100	550.5 424.1	738	108 107	113 112	108 107	101 100	100 98	103 102	101 100	99 98
		HAUST Sound	569 Pressure Drat			ance04	1.5 Meete			95	98 90
	900	232.3	311	105	100	103	00	98	101	04	00
	ENGINE SPEEP00	ENGINE 163.1 POWER 109.3	ENGINE 219 POWER 147	OVERAŬJ. 102	125 ₁₀₇ HZ ₁₀₆	250 ₁₀₁ HZ ₁₀₀	500 ₉₇ HZ ₉₆	1000 ₉₆ HZ ₉₅	2000 ₉₉ HZ ₉₈	4000 ₉₂ HZ ₉₁	8000 ₈₈ HZ ₈₇
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1.305.0	1.750	115	120	115	108	106	108	108	105
	1500	1,075.3	1,442	113	118	113	106	104	106	107	103
	1400 1300	874.2 700.0	1,172 939	111 110	116 115	112 110	104 103	103 101	104 104	105 103	102 101
	1200	550.5	738	108	113	108	103	101	104	103	99
	1100	424.1	569	107	112	107	100	98	102	100	98
	1000	318.6 231,305.0		106 105 105	110 109	107 104 103	100	00	102 94	05	90
	9001500	232305.0	427 311,750 311,442	$105 \\ 100 \\ 103 \\ 00$	109_{107}^{109}	103 ¹⁰³	99 02	98 93 98 92	101 94 93	90 95 94 93	89 89 89 89
	8001400	232305.0 163 075.3 163 874.2	219442	103 08	109 107 107 107	¹⁰¹ aa	97 an	96 00	99 01	92 02	88 87
	900 ¹⁶⁰⁰ 800 ¹⁵⁰⁰ 700 ¹⁴⁰⁰ 1300	109374.2	147 939	103 98 102 96	106 103 103	100 97	96 90	95 90 90	98 91	91 <u>92</u> 90	87 85
	1200	550.5	738	95	102	96	89	89	90	89	84
	1100	424.1	569	94	100	95	88	87	88	88	83
		IAUST Sound		ta (OBG₽)		anceat	7 Meete	•) Feeet)	81	77
	900 ENGINE	ENGINE 232.3	ENGINE 311	OVERရွိ႕	125 ₉₈	250 ₈₉	500 ⁸⁷ 86	1000 ₈₄	2000 ₈₄	4000 79	76 8000 ₇₅
	SPEEP00	POWER 109.3	POWER 147	89	HZ 98	HZ 88	HZ 85	HZ 83	HZ 83	HZ 78	HZ 74
	RPM	BKW	BHP	DB(A)	DB 97	DB	DB	DB	DB	DB	DB /4
	1600	1,305.0	1,750	101	109	103	94	93	94	95	90
	1500	1.075.3	1.442	100	107	101	92	92	93	93	89
	1400	874.2	1,172	98	105	99	90	90	91	92	87
	1300	700.0	939	96	103	97	90	90	91	90	85
	1200	550.5	738	95	102	96	89	89	90	89	84
	1100	424.1	569 427	94 92 or	100 100	95 91	88 88	87 87 o .	88 86	88 81	83 77
	1000 9001600	318.6 235305.0	311,750	01 95	og 102	00 96	87 87	86 87	85 88	80 88	76 84
	8001500	23231075.3 1633742	210772	00 93	og 100	80 ⁹⁴	86 85	84 85	84 86	70 8/	75 82
	7001400 1300	109 874.2 109 700.0	147 ₉₃₉	89 91 89 90	97 99 97 96	⁰⁹ 93 88 91	85 84 85 84	83 83 83 84	83 84 83 84	78 85 78 84	74 80 74 79
	1200	550.5	738	90 88	90 95	89	82	82	83	82	79
	1200	424.1	569	87	93 94	88	81	81	82	81	76
	100 EXI	IAUST Sound	Pressure	ta (OBGF)	⊈Dist	ance 85	15 Maete	ers (849.2	2 Feset)	75	71
	900 ENGINE00	ENGINE 232.3	ENGINE 311	OVERAS	125 ₉₁	250 ⁸⁴ 82	500 ⁸¹	79 1000 ₇₈	2000 79	4000 ₇₂	8000 ₆₈
	SPEEP00		POWER 147	82	HZ 90	HZ 81	500 ₇₉ HZ ₇₈	HZ 77	2000 ₇₇ HZ ₇₆	HZ 71	HZ 67
	RPM	BKW	BHP	oz DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1,305.0	1,750	95	102	96	87	87	88	88	84
	1500	1.075.3	1.442	93	102	94	85	85	86	87	82
	1400	874.2	1,172	91	99	93	84	83	84	85	80
	1300	700.0	939	90	96	91	84	84	84	84	79
	1200	550.5	738	88	95	89	82	82	83	82	77
	1100	424.1	569	87	94	88	81	81	82	81	76
	1000	318.6	427	86	94	85	82	80	80 70	75	71
	900 800	232.3 163.1	311 219	85 83	93 91	84 82	81 79	79 78	79 77	74 72	69 68
	700	109.3	147	83 82	90	o∠ 81	79 78	76 77	76	72	67
	, 00	100.0	177	02	50		10		.0	()	01

	Performa	nce Numbe	r: DM8965	Cha	ange Level:	00					
Sales Model: 3	3512600	1,305.0	1,750	103	99	Ra®ed	Spee@ (R	PM)-981	600 98	96	100
Application: N		,	1,442	102	98		Powe ⁹⁴ ₉₃ (B			95	99
	1400	0/4/	1,172	102	97	Rateu	Powej ₃ (D	96 ¹ ,	303.0 ₉₇	95	98
Rating Level: E				101	98		Power (E			93	97
	1200 1100	550.5 424.1	738 569	101 100	97 96	94 94	90 89	95 94	96 95	93 92	96 95
	MEGHANIC	AL Sownodl	Pressure ₄ Ď ₂ at	a (OBĠĔ)		anceg3	1 Meeter			91	95
		232.3	ENGINE 311		405 95	250 92 92	500 88	1000 ⁹³ 92	2000 ⁹⁴	4000 91 90	
	$\frac{1}{2} \frac{1}{2} \frac{1}$	OWER 163.1	DOWED 219	overaul	125 95 HZ 94	HZ 92 HZ 91	HZ 87	HZ 92	2000 ⁹⁴ HZ 93	HZ 90	8000 ⁹⁴ HZ ₉₃
- F	RPM	BKW 109.3	BHP 147	97 DB(A)	DB 94	DB 91	DB 87	DB 92	DB 93	DB 90	DB 93
	600	1.305.0	1.750	103	99	98	95	98	98	96	100
	500	1.075.3	1,442	102	98	97	94	97	97	95	99
1	400	874.2	1,172	102	97	96	93	96	97	95	98
	300	700.0	939	101	98	95	91	96	96	93	97
	200	550.5	738	101	97	94	90	95	96	93	96
	100 000	424.1	569 427	100 99	96 96	94	89 89	94 94	95 95	92 91	95 95
	0001600	318.6 232,305.0	211.750	99 99 91	96 95 87	93 92 86	88 83	94 93 86	95 94 86	91 91 ⁸⁴	95 94 ⁸⁸
9	8001200	162,475.3	218,442	98 90	95 ⁸⁶	92 ⁸⁵	88 ⁸²	92 ⁸⁵	93 85	90 83	94 87
	700 ¹⁴⁰⁰	109 374.2	14 ^{7,172}	97 90	94 85	91 ⁸⁴	87 81	92 84	93 85	90 83	93 87
	1300 1200	700.0 550.5	939 738	89 89	86 85	83 82	79 78	84 83	85 84	81 81	85 84
	1100	424.1	569	88	84	82	70	82	83	80	83
	MEGHANIC	AL Sound I	Pressure4	a (OBGF)	Dista	ance ₈₁	7 Mæter	rs (<u>82</u> 3.	0 Feget)	80	83
EN		NGINE 232.3 163.1	ENGINE 311		125 83 83	250 ⁸⁰ ₈₀	500 ⁷⁶	1000 ⁸¹	2000 ⁸²	4000 ⁷⁹ ₇₈	8000 ⁸² 82
SF	PEEP ₀₀ P	OWER 163.1 109.3	219 219		HZ 83 HZ 82	HZ 79	HZ 75	HZ 80	HZ 81	HZ 78	HZ 81
F	RPM	BKW	BHP	85 DB(A)	DB 82	DB	DB 75	DB	DB	DB 78	DB
1	600	1,305.0	1,750	91	87	86	83	86	86	84	88
	500	1.075.3	1.442	90	86	85	82	85	85	83	87
	400	874.2	1,172	90	85	84	81	84	85	83	87
	300 200	700.0 550.5	939 738	89 89	86 85	83 82	79 78	84 83	85 84	81 81	85 84
	1200	424.1	569	88	83 84	82	77	82	83	80	83
1	000	319 6	127	87	84	81	77	82	83	80	83
9	9001600	232,305.0	311,750	87 85	83 81	80 80	76 77	81 80	82 80	79 78	82 82
8	800 ¹⁵⁰⁰	232:50010 163:1075.3	219,442 219,172	86 85 85 84	83 80 82 80	80 79 70 79	76 76 75 76	81 79 80 79	81 80 81 79	78 78 78 77	82 81 81 81
-	700 ¹⁴⁰⁰ 1300	109.974.2 109.970.0	147,172 939	85 ⁸⁴ 83	82 ⁸⁰ 80	79 ⁷⁹ 77	75 ⁷⁶ 73	80 79 78	81 79 79	78 // 76	81 81 79
	1200	550.5	738	83	79	77	72	77	78	75	78
		424.1	569	82 (OPOE)	79 Dict	76	72	77	$2 = \frac{78}{5}$	74	78
			Pressure4Dat			ance;5	15 Meter	•••		74 73	77 76
EN	IGIN ₅₀₀ EI		ENGINE 311 219		125 ⁷⁷ 77	250 ⁷⁵ 74	500 70 70	1000 ⁷⁵ 75	2000 ⁷⁶ 76	4000 ⁷³ ₇₂	8000 ⁷⁶ 76
SF	РЕЕ <mark>Р</mark> 00 Р	ower _{109.3}	POWER 147	80	н z ₇₆	н z ₇₃	н г ₆₉	HZ ₇₄	н z ₇₅	н z ₇₂	н z ₇₅
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	600	1,305.0	1,750	85 85	81	80 70	77 76	80	80	78	82
	500 400	1.075.3 874.2	1.442 1,172	85 84	80 80	79 79	76 76	79 79	80 79	78 77	81 81
	300	700.0	939	83	80	77	73	78	79	76	79
	200	550.5	738	83	79	77	72	77	78	75	78
1	100	424.1	569	82	79	76	72	77	78	74	78
	000	318.6	427	82	78	75	71	76	77	74	77
	900	232.3	311	81 80	77	75 74	70 70	75 75	76 76	73 72	76 76
	800 700	163.1 109.3	219 147	80 80	77 76	74 73	70 69	75 74	76 75	72 72	76 75
		100.0	177	00	10		55	. –		. 2	

Data Date: 3/29/2011

	Perfo	rmance Numbe	r: DM8966	CI	nange Level:	00					
Sales Model:	3512600	1,380.0	1,851	115	120	Rattori	Sneddar	RPM):1071,6	SOO 108	109	106
		PROPULS	1,525	113	118			KW) ¹⁰⁵ 1,3		107	104
				112	117					105	102
Rating Level:		G (MAXIMŲ́Įų́)ŽC			115			3HP): ₁₀₂ 1,8		103	101
	1200 1100	582.2 448.4	781 601	109 107	114 112	109 107	102 100	100 99	103 102	102 100	100 98
		IAUST Sound	Pressure ₄ D ₂ at			ance _{b4}	1.5 Mete		Fejet)	95	90
		ENGINE 245.6	ENGINE 329		125 ¹⁰⁹ 108	250 ¹⁰³ ₁₀₂	500 ⁹⁹ 98	1000 ⁹⁸ 97	2000 101	4000 ⁹⁴ 93	8000 ⁸⁹ 88
•	SPEED	DOWED 1/2.5	DOWED 231			HZ 100	HZ 98	HZ 05	HZ 98	HZ 91	HZ 87
	RPM	BKW	BHP	102 DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1.380.0	1.851	115	120	116	108	107	108	109	106
	1500 1400	1,137.1 924.5	1.525 1.240	113 112	118 117	114 112	106 105	105 103	106 105	107 105	104 102
	1300	740.2	993	112	117	112	103	103	105	103	102
	1200	582.2	781	109	114	109	102	100	103	102	100
	1100	448.4	601	107	112	107	100	99	102	100	98
	1000	336.9 245.880.0	452	106 102	110	104	100	99 08 94	102 101 95	95 04 95	90 90 91
	900 ¹⁶⁰⁰ 800 ¹⁵⁰⁰	245,800.0 172,137.1	452 329,851 231,525	105 102 104 100	109 109 108 107	103 103 102 101	99 94 98 92	98 94 97 92	101 ⁹⁵ 100 ⁹³	94 95 93 94	89 91 88 ⁸⁹
	7001400	112.5	155,240	104 98 102 98	108 106 106 102	102 100 100 100	98 91 96 91	97 90 95 90	98 91	93 92 91 92	88 87 87
	1300	740.2	993	97	103	90	91	91	91	91	86
	1200	582.2	781	95	102	96	89	89	90	89	84
	1100 100 5 X I	HAUST South	601 Pressure4	94 a (OBC)5	100 1 Dist	95 anceg ₂	88 7 Megte	⁸⁸ rs (8 <mark>2</mark> ;3.0	88) Fegert)	88 82	83 78
I		ENGINE 245.6 172.5	ENGINE 329 231	OVERAUL	125 99 98	250 ⁹⁰ ₈₉	500 ⁸⁷ 86	1000 ⁸⁶ 85	2000 ⁸⁵ 84	4000 ⁸⁰ ₇₉	8000 ⁷⁶ 75
	SPEEP ₀₀	POWER 115.6	POWER 155	89	н г ₉₇	68	HZ 85	нz ₈₄	нz ₈₃	н z ₇₈	HZ $_{74}$
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1,380.0	1,851	102 100	109 107	103 101	94 92	94 02	95 93	95 94	91 89
	1500 1400	1.137.1 924.5	1.525 1,240	98	107	101	92 91	92 90	93 91	94 92	89 87
	1300	740.2	993	97	103	98	91	91	91	91	86
	1200	582.2	781	95	102	96	89	89	90	89	84
	1100	448.4	601	94	100	95	88	88	88	88	83
	1000 9001600	336.9 245.880.0	452 329,851	93 91 95	101 99 103	92 90 97	89 87 ⁸⁸	87 86 87	87 85 ⁸⁸	82 80 89	78 76 ⁸⁴
	0001500	1-1,13/.1	001.020	90 93	99 98 101	90 89 95	86 86	85 85	84 ⁸⁶	80 79 ⁸⁷	76 82
	7001400	115.8 ^{24.0}	15 ^{5,240}	₈₉ 92	97 ⁹⁹	88 ⁹³	85 ⁸⁴	84 ⁸⁴	83 ⁸⁵	78 ⁸⁵	74 ⁸¹
	1300 1200	740.2 582.2	993 781	90 89	97 95	91 90	84 83	84 82	85 83	84 83	79 78
	1200	448.4	601	89 87	95 94	90 88	81	81	82	81	76
		AUST Sound				ance ₈₅	15 Meete		2 Feet)	75	71
I		ENGINE 245.6 172.5	ENGINE 329 231		125 93 92	250 ⁸⁴ ₈₃	500 ⁸¹ ₈₀	1000 ⁷⁹ 78	2000 ⁷⁹ 78	4000 ⁷⁴ ₇₃	8000 ⁷⁰ 68
	SPEED	POWER 172.5 115.6	POWER 155	82	nz 90	HZ 83 81	HZ 78	HZ 77	HZ 76	HZ 73 71	HZ 67
	RPM 1600	BKW 1,380.0	BHP 1,851	DB(A) 95	DB 103	DB 97	DB 88	DB 87	DB 88	DB 89	DB
	1500	1.137.1	1.525	95 93	103	97 95	00 86	85	oo 86	89 87	82
	1400	924.5	1,240	92	99	93	84	84	85	85	81
	1300	740.2	993	90	97	91	84	84	85	84	79
	1200	582.2	781	89	95	90	83	82	83	83	78
	1100	448.4	601	87	94	88 95	81 82	81 80	82	81 75	76 71
	1000 900	336.9 245.6	452 329	86 85	94 93	85 84	82 81	80 79	80 79	75 74	71 70
	800	172.5	231	84	92	83	80	78	78	73	68
	700	115.6	155	82	90	81	78	77	76	71	67

Sound Performance Number: DN

	Performa	ance Numbe	r: DM8966	Cha	ange Level:	00					
Sales Model:	3511000	1,380.0	1,851	103	99	Raigd	Sneed (F	2DW) -98 1	600 ⁹⁸	96	100
Application:		1,137,1	1,525	102	98	Poted		RPM): ⁹⁸ 1, 3KW):97 1,	200 Å ⁷	95	99
Application:			1,240	102	97					95	98
Rating Level:	•				98		•	BHP):96 1,		93	97
	1200 1100	582.2 448.4	781 601	101 100	97 96	94 94	90 89	95 94	96 95	93 92	96 95
			Pressure4			ance	1 Maete			92 91	95 95
			329	ົ່ງດໍ	05	00	00	` ^^	04	01	94
El			ENGINE 231	OVERĂĸ	125 ₉₅	250 ₉₂	500 ⁰⁰ 88	1000 ₉₂	2000 93	4000 90	8000 ₉₄
		110.0	POWER 155	97	HZ ₉₄	HZ 91	HZ 87	HZ 92	HZ 93	HZ 90	HZ 93
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1.380.0	1.851	103	99	98	95	98 97	98 97	96	100
	1500 1400	1,137.1 924.5	1.525 1,240	102 102	98 97	97 96	94 93	97 96	97 97	95 95	99 98
	1300	740.2	993	102	98	90 95	93 91	90 96	96	93 93	90 97
	1200	582.2	781	101	97	94	90	95	96	93	96
	1100	448.4	601	100	96	94	89	94	95	92	95
	1000 900	336.9 245380.0	452 329 851	99 91	96 05 87	93 86	89 83	94 86	95 86	91 01 84	95 88
	900	²⁴ 1 137 1		99 00	95 86	92 85	00 00	93 05	94 85	91 03	94 87
	9001500 8001500 7001400	1/2.5	²³ 1 ²⁴⁰	98 90 97 90	95 85 94 85	92 83 91 84	88 07 81	92 84	93 02 85	90 83 90 83	94 87 93 87
	1300	115_6 ^{924.5} 740.2	155 993	89	86	83	⁰⁷ 79	92 84 84	85	81	⁹³ 85
	1200	582.2	781	89	85	82	78	83	84	81	84
	1100 MECCHANIC	448.4	601 Pressure4	88 (OP@E)	84 Dict	82 ance31	77 7 Mræte	82 ers (823.	83 0 Feeest)	80	83
	000	245.6	329	` 87´	83	00			on '	80 79	83 82
El	NGINE E	NGINE 172.5	ENGINE 231	OVERĂĹ	125 ₈₃	250 ⁸⁰ 80	500 ⁷⁶ 76	81 1000 ₈₁	2000 ₈₁	4000 ₇₈	8000 ₈₂
S	PEEP ₀₀ P	POWER 115.6	POWER 155	85	HZ 82	HZ ₇₉	HZ 75	HZ 80	HZ 81	HZ 78	HZ 81
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600 1500	1,380.0 1.137.1	1.851 1.525	91 90	87 86	86 85	83 82	86 85	86 85	84 83	88 87
	1400	924.5	1,240	90 90	85	83 84	81	84	85	83	87
	1300	740.2	993	89	86	83	79	84	85	81	85
	1200	582.2	781	89	85	82	78	83	84	81	84
	1100	448.4	601	88	84	82	77	82	83	80	83
	1000 900	336.9 245380.0	452 329 505	87 85	⁸⁴ 81	81 80	77 77	82 80	83 80	80 78	83 82
	900 1500 800	<u>-</u> 77'7'37 1	320 1,525 231 240	87 85 86 85	83 80 83 80	80 79 80 70	$\frac{76}{70}$ 76	81 79 81 70	82 80 81 70	79 78 78 77	82 81 82 91
	8001500 8001400 7004000	172.5 115.6 115.6	15 ²⁴⁰	85 84	82 80	70 /9	75 /0	00 /9	. 19	70 //	81 81
	1300	115 6 740.2	993	83	80	11	73	78	79	76	79
	1200 1100	582.2 448.4	781 601	83 82	79 79	77 76	72 72	77 77	78 78	75 74	78 78
	MECHANIC		Pressure			ance?.5	15 Mrete			74	77
	900 NGINE00 E	245.6	329	01	125 ⁷⁷ 125 ₇₇	250 ⁷⁵ 250 ₇₄	500 ⁷⁰ ₇₀	75 1000 ₇₅	2000 ₇₆	4000 ₇₂	76
EI	NGINGO0 E	IT2.5	ENGINE 231 POWER 155	overål	12577	250 74		100075	200076	400072	8000 ₇₆
	RPM	POWER 115.6 BKW	BHP	80 DB(A)	HZ 76 DB	HZ ₇₃ DB	нz ₆₉ DB	HZ 74 DB	HZ 75 DB	HZ 72 DB	HZ 75 DB
	1600	1,380.0	1,851	85	81	80	77	80	80	78	82
	1500	1.360.0	1.525	85	80	80 79	76	80 79	80 80	78 78	82 81
	1400	924.5	1,240	84	80	79	76	79	79	77	81
	1300	740.2	993	83	80	77	73	78	79	76	79
	1200	582.2	781	83	79	77	72	77	78	75	78
	1100	448.4	601	82	79	76	72	77	78	74	78
	1000 900	336.9 245.6	452 329	82 81	78 77	75 75	71 70	76 75	77 76	74 73	77 76
	900 800	245.6 172.5	329 231	81	77	75 74	70 70	75 75	76 76	73 72	76 76
	700	115.6	155	80	76	73	69	74	75	72	75
					-	-			-		-

	Perfo	ormance Numbe	r: DM9230	CI	hange Level:	00					
Sales Model:	35110600	1.051.0	1.409	113	118	Datad	Snod@6(DDM\1041 6	300 106	106	103
	1589	PROPULS	1,161	111	116		5peeu (RPM) ¹⁰⁴ 1,6 BKW) 101	104	105	102
			944	110	115	Rated	Powerg	BKW)1011,0	J51.403	104	100
Rating Level:		G (MAXIM56977C	,		114			(BHP) 1001,4		102	100
	1200	443.4	595	107	112	107 106	100	99 97	102	100	98
	1100 100 5 X I	341.5 HAUST Southed	458 Pressure Dat	106 a (OB@E)	111 1 Dist :		99 1.5 Met	• •	101 Feet)	99 94	97 89
	000		251	104	100	102	00	07	100	02	88
	ENGINE00 SPEEP00	ENGINE 131.4	ENGINE 176 POWER 118	OVER 쉐깅 102	125 ₁₀₇ HZ ₁₀₆	250 ₁₀₁ HZ ₁₀₀	500 ₉₇ HZ ₉₆	1000 ₉₆ HZ ₉₅	2000 ₉₉ HZ 98	4000 ₉₂ HZ ₉₁	8000 ₈₇ HZ 86
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1.051.0	1.409	113	118	113	106	104	106	106	103
	1500	866.0	1,161	111	116	112	104	103	104	105	102
	1400	704.1	944	110	115	110	103	101	103	104	100
	1300	563.7	756	109	114	109	102	100	103	102	100
	1200	443.4	595	107	112	107	100 99	99 07	102	100	98 07
	1100	341.5 256.6	458	106 105	111 109	106	99 99	97 98 or	101 101	99 94	97 89
	1000 9001600	256.6 1051.0 187.200	344 251,409	105 104 99 102 98	109 107	103 102 101 101 99	og 92	07 91	100 92	03 93	88 88
	8001500	866.0	176,161		$108 \\ 107 \\ 107 \\ 104 \\ 104$		97 ⁹⁰	96 ⁹⁰	aa ⁹¹	a2 92	87 ⁸⁷
	700 ¹⁴⁰⁰ 1300	88 0	¹¹⁸ 944 118756	102 97 102 95	107 106 102	100 98	06 89	05 ⁸⁹	og 90	01 90	86 86
	1300		756			96	89	89	90	89	84
	1200	443.4	595	94	100	95	88	88	88	88	83
	1100	341.5 HAUST Southerd	458 Broccure Date	93 (OP@E)	99 Dict	94 ance90	87 7 Maerte	86 arc (8 2 30	87)Fe3est)	87 80	82 76
	900	187.1	251	`	00	00	86	`or	04	70	75
	ENGINE	ENGINE 131 4	ENGINE 176	OVERAL	125 ₉₇	250 ₈₈	500 ₈₅	1000 ₈₄	2000 ₈₃	4000 ₇₈	8000 ₇₄
	SPEEP00	POWER 88.0	POWER 118	88	HZ 96	HZ 87	HZ 84	HZ 83	HZ 82	HZ_{77}	HZ ₇₃
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1,051.0	1,409	99	107	101	92	91	92	93	88
	1500	866.0	1.161	98	105	99	90	90	91	92	87
	1400	704.1	944	97	104	98	89	89	90	90	86
	1300	563.7	756 595	95 94	102 100	96 95	89 88	89 88	90 88	89 88	84 83
	1200 1100	443.4 341.5	595 458	94 93	99	95 94	00 87	00 86	00 87	87	82
	1000	256.6	344	01	99	00	87	86	85	80	76
	1000 9001600 800	256.6 1051.0 187.200	254,409	on 93	as 100	80 ⁹⁴	86 85	85 85	84 80	70 86	75 82
	800 ₁₅₀₀ 800 ₁₄₀₀	131 <u>4</u> 131 <u>4</u> 88 704.1	176	89 ⁹¹	07 99	oo 93	og 84	o4 83	83 ⁸⁴	79 85	74 80
	700 ¹⁴⁰⁰ 1300	88.0 563.7	¹¹⁸ 944 ¹¹⁸ 756	88 90	06 ⁹⁷	87 91 87 90	g/ 82	gg 82	en 83	77 84	73 19
	1200	563.7 443.4	756 595	89 87	90 95 94	90 88	⁰⁴ 83 81	82 81	⁰² 83 82	′′ 83 81	75 78 76
	1200	341.5	458	86	94 93	80 87	80	80	82 81	80	75
		HAUST Sound				ance34	15 Meet		? Ferent)	74	70
	900 ENGINE00	ENGINE 187.1 131.4	251 ENGINE 176		00	00	500 ⁸⁰	1000 ₇₇	2000 ₇₇	4000 ₇₂	e000 ⁶⁹
		ENGINE 131.4	1/0	overäjl	125 ₉₁	250 ⁸³ ₈₂	500 79		2000 ₇₇	4000 ₇₂	8000 ₆₈
	SPEEP00 RPM	POWER 88.0 BKW	BHP	82	HZ 90 DB	HZ 81 DB	HZ 78 DB	нz ₇₆ DB	HZ 76 DB	HZ 71 DB	н z ₆₇ DB
				DB(A) 93	100	94			86	86	
	1600 1500	1,051.0 866.0	1,409 1.161	93 91	100 99	94 93	85 84	85 83	86 84	86 85	82 80
	1400	704.1	944	90	99 97	93 91	82	82	83	84	80 79
	1300	563.7	756	90 89	95	90	83	82	83	83	78
	1200	443.4	595	87	94	88	81	81	82	81	76
	1100	341.5	458	86	93	87	80	80	81	80	75
	1100	341.5	400								
	1000	256.6	344	85	93	84	81	79	79	74	70
						84 83	81 80	79 78	79 78	73	69
	1000	256.6	344	85	93						

Sound Performance Number: DN

	Perfor	mance Numbe	r: DM9230	CI	nange Level:	00					
Sales Model:	3512600	1,051.0	1,409	103	99	Ra\$êd	Spee®d5(F	RPM): 98 1	.600 98	96	100
		ROPULS	1,161	102	98		Power ⁹⁴ (B			95	99
				, 102	97	Rated 96		96 1	400 ⁹⁷	95	98
Rating Level:		(MAXIMĹĬŇĹŻ			98		Power (E			93	97
	1200	443.4	595	101	97	94	90 89	95	96	93 92	96
	MEGHAN	NICAL Sound	Pressure Dat	a (OBGE)	Dista	94 ancej3	1 Mete	rs (⁹⁴ 94 <mark>3</mark> .3	95 3 Feget)	92 91	95 95
		187.1	ENGINE 251	OVERAL	125 95 95	250 ⁹²	500 ⁸⁸		2000 ⁹⁴ 93	4000 ⁹¹ 90	8000 ⁹⁴ 94
	ENGINE SPEED		POWER 1/6	98	HZ 95 94	HZ 92 91	HZ 88 87	1000 ⁹³ нz ₉₂	HZ 93	HZ 90	HZ 93
	RPM	BKW 88.0	BHP 118	97 DB(A)	DB 94	DB 91	DB 87	DB 92	DB 93	DB 90	DB 93
	1600	1.051.0	1.409	103	99	98	95	98	98	96	100
	1500	866.0	1,161	102	98	97	94	97	97	95	99
	1400	704.1	944	102	97	96	93	96	97	95	98
	1300	563.7	756	101	98	95	91	96	96	93	97
	1200	443.4	595	101	97	94	90	95	96	93	96
	1100	341.5	458	100	96	94	89	94	95	92	95
	1000	256.6	344	99 00 91	96 05 87	93 92 86	89 88 83	94 03 86	95 ₀⊿ 86	91 01 84	95 04 88
	900 ¹⁶⁰⁰ 800 ¹⁵⁰⁰	187,951.0 131. <u>4</u> 66.0	25 ¹ ,409 176,161	33	90	32 0-	00	30	37 07	31	34
	700 ¹⁴⁰⁰	88.7 ^{04.1}	176,101 118 ⁹⁴⁴	98 90 97 90	95 86 94 85	92 ⁸⁵ 91 ⁸⁴	88 82 87 81	92 85 92 ⁸⁴	93 85 93 85	90 83 90 83	94 87 93 87
	1300	563.7	756	97 88 89	94 86	83	79	92 01 84	93 85	90 80 81	85
	1200	443.4	595	89	85	82	78	83	84	81	84
		341.5	⁴⁵⁸ Pressure₃₽at		84 Dicto	82 ance ₈₁	77 7 Moto	$(\frac{82}{23})$	$6 = \frac{83}{600}$	80	83
		107 1	051				7 M/ete		0 Feet)	80 79	83 82
		ENGINE 131 /	ENGINE 176	OVERALL	125 ⁸³ 83	250 ⁸⁰ 80	500 76 76	1000 ⁸¹ 81	2000 ⁸²	4000 ⁷⁹ 78	8000 ⁸²
	SPEED	POWER 88.0	POWER 118	85	н г ₈₂	н г ₇₉	HZ 75	нz ₈₀	н г ₈₁	нz ₇₈	н г ₈₁
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1.051.0	1,409	91	87	86	83	86	86	84	88
	1500 1400	866.0 704.1	1.161 944	90 90	86 85	85 84	82 81	85 84	85 85	83 83	87 87
	1300	563.7	944 756	90 89	86	83	79	84 84	85	83 81	85
	1200	443.4	595	89	85	82	78	83	84	81	84
	1100	341.5	458	88	84	82	77	82	83	80	83
	1000	256.6	344	87	84	81	77	82	83	80	83
	9001600	187,951.0	251,409	87 85	83 ⁸¹	80 80	76 ⁷⁷	81 ⁸⁰	82 80	79 ⁷⁸	82 82
	800 ¹⁵⁰⁰	131.466.0	176,161	86 85	83 80	80 79	76 76	81 79	81 80	78 78	82 81
	7001400	88.704.1	118 944	85 84	82 80	79 79	75 76	80 79	81 79	78 77	81 81
	1300 1200	563.7 443.4	756 595	83 83	80 79	77 77	73 72	78 77	79 78	76 75	79 78
	1200	341.5	458	82	79	76	72	77	78	75	78
	М₽б₽на	NICAL Sound	Pressure ₃ D _p at	a (OBĞĒ)	-Baista	ance; ₅	15 M _r ete	rs (₇ 489.	2 Fejert)	74	77
	ENGINE SPEED	ENGINE 187.1	ENGINE 251		125 ⁷⁷ 77	250 ⁷⁵ ₇₄	500 70	1000 ⁷⁵	2000 76	4000 73	8000 ⁷⁶
	SPEED	POWER 88.0	POWER 176 118	80 80	HZ 77 HZ 76	HZ 74 73	HZ 69	HZ $^{75}_{74}$	HZ 76 75	HZ 72 HZ 72	HZ 75
	RPM	BKW	BHP	DB(A)	DB '	DB	DB	DB ⁷⁴	DB 'S	DB	DB
	1600	1,051.0	1,409	85	81	80	77	80	80	78	82
	1500	866.0	1.161	85	80	79	76	79	80	78	81
	1400	704.1	944	84	80	79 77	76	79 70	79 70	77	81
	1300	563.7	756	83	80	77	73 72	78 77	79 79	76 75	79 79
	1200 1100	443.4 341.5	595 458	83 82	79 79	77 76	72 72	77 77	78 78	75 74	78 78
	1000	256.6	456 344	82 82	79 78	76 75	72	76	78 77	74 74	78 77
	900	187.1	251	81	78	75	70	75	76	73	76
	800	131.4	176	80	77	74	70	75	76	72	76
	700	88.0	118	80	76	73	69	74	75	72	75

	Perfor	mance Numbe	r: DM9231	Cł	nange Level:	00					
Sales Model:	3512600	1,014.0	1,360	112	117	Ratted	Snedd5/F	RPM): 1041,0	300 106	106	103
		ROPULS	1,120	111	116			KW) ¹⁰³ 1,0		105	102
	1400	n/9.1	911	110	115		103	101 [']	103	103	100
Rating Level:				108	113			BHP):1001,3		101	99
	1200 1100	427.8 329.5	574 442	107	112 111	107 106	100 99	99 97	102	100 99	98 97
	100 5XH	AUST South	Pressure	a (OBCF)	₁Ðgist	ance	1.5 Mete	rs (₉₈ 4.9	Fejet)	99 94	97 89
		ENGINE 180.5 POWER 126.8 84.9	ENGINE 242 POWER 170 114	OVERALL 103 102	125 ¹⁰⁸ HZ ₁₀₇ HZ ₁₀₆	250 ¹⁰² HZ ₁₀₁	500 ⁹⁸ HZ 97 96	1000 ⁹⁷ HZ 96 95	2000 ¹⁰⁰ нz ₉₉	4000 ⁹³ HZ 92 91	8000 ⁸⁸ HZ 87 86
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1.014.0	1.360	112	117	113	105	104	106	106	103
	1500 1400	835.5 679.3	1.120 911	111 110	116 115	112 110	104 103	103 101	104 103	105 103	102 100
	1300	543.9	729	108	113	108	103	100	103	103	99
	1200	427.8	574	107	112	107	100	99	102	100	98
	1100	329.5	442	106	111	106	99	97	100	99	97
	1000	247.6	332	105	109	103	99 02	98 97 91	101	94 02 93	89
	900 ¹⁶⁰⁰ 800 ¹⁵⁰⁰	180.8 ^{14.0} 126.8 ^{35.5}	24 <u>5</u> ,360 17 0 ,120	103 99 103 98	108 107 108 107 107 105	102 101 101 99	98 92 97 90	31	100 92 99 91	93	88 88 87 87
	700 ¹⁴⁰⁰	126.800.0 84.979.3	114 911	103 96	107 103	101 98 100 98	97 90 96 ⁸⁹	96 90 95 88	99 91 98 89	92 91 91 ⁹⁰	87 87 86 85
	1300	543.9	729	95	100	96	89	89	89	89	84
	1200	427.8	574	94	100	95	88	87	88	88	83
	1100 100 EXH	AUST Sound	Pressure Dat	93 (OBGF)	99 DAist	94 ance30	7 Meete	rs (⁸⁶ 8 2 3.0	87) Feget)	87 80	82 76
		100 5	242		08	250 ⁸⁹ ₈₈	500 ⁸⁶	1000 ⁸⁵ 84	2000 ⁸⁴	4000 ⁷⁹ 78	8000 ⁷⁵
	SPEED	POWER 126.8	ENGINE 170 POWER 114	OVERALL	120	250 HZ 88 87	85 NR	1000 17 ⁸⁴	117 00	4000 17 ⁷⁸	117 ' 7
	RPM	BKW	BHP 114	88 DB(A)	н z 97 96 DB	DB 87	п2 ₈₄ DB	HZ 84 83 DB	пг ₈₂ DB	HZ 78 77 DB	Π2 73 DB
	1600	1,014.0	1,360	99	107	101	92	91	92	93	88
	1500	835.5	1.120	98	105	99	90	90	91	91	87
	1400	679.3	911	96	104	98	89	88	89	90	85
	1300	543.9	729	95	101	96	89	89	89	89	84
	1200	427.8	574	94	100	95	88	87	88	88	83
	1100 1000	329.5 247.6	442 332	93 91	99 99	94 90	87 87	86 86	87 85	87 80	82 76
	900 ¹⁶⁰⁰	180.914.0	242,360	90 92	98 100	89 94	86 ⁸⁵	85 ⁸⁴	84 ⁸⁶	79 ⁸⁶	75 81
	₈₀₀ 1500	126 835.5	₁₇ ֆ,120	89 91	97 99	88 ⁹³	85 ⁸⁴	84 ⁸³	83 ⁸⁴	78 ⁸⁵	74 ⁸⁰
	7001400	84.679.3	114 911	88 90	96 97 95	87 91 89	84 82	83 82 82	82 83 83	77 83 82	73 79
	1300 1200	543.9 427.8	729 574	88 87	95 94	88	82 81	o∠ 81	82	o∠ 81	77 76
	1100 100 5XH	329 5	Pressure ₃ D ₂ at	86	92	87 ance ₈₄	80 15 Meete	rs (₇ 4 9.2	80 2 Feret)	80 74	75 70
		ENGINE 180.5	ENGINE 242	OVERALL	125 ⁹²	250 ⁸³	500 ⁸⁰ 70	1000 ⁷⁸	2000 78	4000 ⁷³	8000 ⁶⁹
	SPEE0	POWER 126.8 84.9	POWER 170 114	83 82	HZ 91 HZ 90	HZ 82 81	HZ 79 78	HZ $\frac{77}{76}$	HZ_{76}^{77}	HZ 72 71	HZ 68 67
	RPM	BKW 04.9	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1,014.0	1,360	92	100	94	85	84	86	86	81
	1500	835.5	1.120	91	99	93	84	83	84	85	80
	1400 1300	679.3	911 729	90 88	97 95	91 89	82 82	82 82	83 83	83 82	79 77
	1300 1200	543.9 427.8	729 574	88 87	95 94	89 88	82 81	82 81	83 82	82 81	76
	1100	329.5	442	86	92	87	80	80	80	80	75
	1000	247.6	332	85	93	84	81	79	79	74	70
	900	180.5	242	84	92	83	80	78	78	73	69
	800	126.8	170	83	91	82	79	77	77	72	68
	700	84.9	114	82	90	81	78	76	76	71	67

	Performar	nce Number	r: DM9231	Cha	nge Level:	00					
Sales Model: 3	3511000	1,014.0	1,360	103	99	Raight	Sneed (F	2 PM\ 98 1	600 98	96	100
Application: N		DUI 693515	1,120	102	98	Patra	Speed (F 94 Powes (B	97 1	014 87	95	99
			911	102	97					95	98
Rating Level: E				101	98		Power (E	,		93	97
	1200 1100	427.8	574 442	101 100	97 96	94 94	90 89	95	96 95	93 92	96
		329.5 M Sommod I	Pressure Dat			ancon3	1 Mete	94 rs (94 3 .3		92 91	95 95
			242		05	92	00	`^^	01	91	04
EN	900 IGINE EN		ENGINE 170	overål	125 ₉₅	250 ₉₂	500 ₈₈	1000 ₉₂	2000 ₉₃	4000 ₀₀	8000 ₉₄
	PEEP ₀₀ PC	ower _{84.9}	POWER 114	97	HZ 94	HZ 91	HZ ₈₇	HZ ₉₂	HZ ₉₃	н z ₉₀	HZ ₉₃
F	RPM E	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1.014.0	1.360	103	99	98	95	98	98	96	100
	1500	835.5	1,120	102	98	97	94	97	97	95	99
	1400	679.3	911	102	97 00	96 05	93	96 00	97 00	95	98
	1300 1200	543.9 427.8	729 574	101 101	98 97	95 94	91 90	96 95	96 96	93 93	97 96
1	1100	329.5	112	100	96	94 94	90 89	93 94	90 95	93 92	90 95
1	1000 1000 900 500	247.6 180014.0	332 242360 242120	00	96	03	89	0/	95	01	95
	900 500		242,000	00 91	05 87	02 86	oo 83	02 86	04 86	01 84	o/ 88
	800	126835.5 126879.3 84542.0	170'20	98 90 98 90	95 86 95 86	92 85 92 84	88 82	93 85 92 84	93 85 93 85	90 83	94 87 94 87
	7001400 1300	84 9 9.3 543.9	¹¹⁴ 729	97 90 97 89	94 85 86	91 83	87 81 87 79	92 ⁸⁴ 84	93 85 85	90 83 81	93 87 85
	1200	427.8	574	89	85	82	78	83	84	81	84
	1100	329.5	442	88	84	82	77	82	83	80	83
		AL Soctated I	PressuretDat	a (OBCF)	8Dist	ance:	7 Miete		0 Feet)	80	83
EN	900 IGINE00 EN	180.5	242	0VEP 87	42E ⁸³	25080	F00 ⁷⁶	81 1000 ₈₁	2000 82	⁷⁹	82
			ENGINE 170	OVERĂL	125 ₈₃	250 ₈₀	500 ₇₆		2000 ₈₁	4000 ₇₈	8000 ⁶²
		OWER 84.9	POWER 114 BHP	85	HZ 82	HZ ₇₉ DB	HZ ₇₅ DB	нz ₈₀ DB	HZ ₈₁ DB	нz ₇₈ DB	нz ₈₁ DB
				DB(A) 91	DB 87	86	83		86	84	88
	1600 1500	1,014.0 835.5	1,360 1.120	91 90	86	85	82	86 85	85	83	87
	1400	679.3	911	90	85	83 84	81	84	85	83	87
	1300	543.9	729	89	86	83	79	84	85	81	85
	1200	427.8	574	89	85	82	78	83	84	81	84
1	1100	329.5	442	88	84	82	77	82	83	80	83
1	1000 1000 900	247.6	332 242360	87 87 85	84 81	81 80 80	77 77	82 84 80	⁸³ 80	80 78	⁸³ 82
			242300 1120 170 111	8/ 85	83 80	80 70	10 -0	81 70	82 80	⁷⁹ 78	82 81
	800	126,8,0,0	170,911	86 84	83 80	80 70	/6 76	81 ₇₀	81 70	⁷⁸ 77	82 81
	7001400 1300	84 9 9.3 543.9	¹¹⁴ 729	85 83	82 80 80	79 75 77	75 73	⁸⁰ 78	81 79 79	78 76	81 79
	1200	427.8	574	83	79	77	72	77	78	75	78
	1100	329.5	442	82	79	76	72	77	78	74	78
		AL 5294/160 1	Pressure Dat	· · ·		ance 5	15 Mete	•		74	77
EN	900 IGINE00 EN	IGINE 180.5 126.8	ENGINE 242 170		125 ₇₇	250 ₇₄	500 ₇₀	1000 ₇₅	2000 ₇₆	4000 ₇₂	8000 ₇₆
	PEEP00 PC	OWER 84.9	POWER 114	80	HZ 76	HZ 73	HZ 69	HZ 74	HZ_{75}	HZ 72	HZ 75
F		BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
1	1600	1,014.0	1,360	85	81	80	77	80	80	78	82
	1500	835.5	1.120	85	80	79	76	79	80	78	81
	1400	679.3	911	84	80	79	76	79	79	77	81
	1300	543.9	729	83	80	77	73	78	79	76	79
	1200	427.8	574	83	79 70	77	72	77	78 79	75	78
	1100 1000	329.5	442	82 82	79 78	76 75	72 71	77 76	78 77	74 74	78 77
	900	247.6 180.5	332 242	82 81	78 77	75 75	71	76 75	76	74 73	76
	800	126.8	170	80	77	73 74	70	75	76	72	76
	700	84.9	114	80	76	73	69	74	75	72	75
					-	-			-		-

	Perfor	mance Numbe	er: DM9232	Cł	nange Level:	00					
Sales Model:	3511200	955.0	1,281	112	117	Rátêc	l Sneå@5(RPM) ¹⁰⁴ 1	600 105	106	103
		ROPULS	1,055	111	116	111 Dated		BKW) ₁₀₂ 9	55 0 ¹⁰⁴	104	101
				109	114					103	100
Rating Level:	1200	(UNRES新民位 402.9	540	10003108	113 112	107	1 Power (100	BHP)99 1 98	,201103 101	101 100	99 98
	1100	310.3	416	107	112	107	99	90 97	101	99	98 97
		AUST Spand				anceo3	1.5 Mete			94	89
	900 ENGINE	ENGINE 170.0 119.4	ENGINE 228		107	101	97 500 ₉₇	96 10096	2000 99	92 400	8000
	SPEEP00	POWER 80.0	POWER 107	OVERAU 102	125 ₁₀₇ HZ ₁₀₆	250 ₁₀₁ HZ ₁₀₀	HZ 96	HZ 95	HZ 98	HZ ₉₁	8000 ₈₇ HZ ₈₆
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	955.0	1.281	112	117	113	105	104	105	106	103
	1500	786.9	1,055	111	116	111	104	102	104	104	101
	1400 1300	639.8 512.2	858 687	109 108	114 113	110 108	102 101	101 99	102 103	103 101	100 99
	1200	402.9	540	108	112	108	101	99 98	103	101	99 98
	1100	310.3	416	106	111	106	99	97	100	99	97
	1000 900	233.2	313 228281 228055	105 103 99	109106	103 101 100	99 97 91	98 99 91	101 92	94 92 92	89 88
	900 1500	170-00.0 170-786.9 119-439-8	228201 160 160	103 97	109 107106 107105 107102	· - · 00	97 00	96 80	99 00	92 01	88 86
	9001500 8001500 7001400	119,4,50,6	160 858	103 99 103 97 103 96	107 103	101	97 00	96 88	99 80	92 an	87 85
	⁷⁰⁰ 1300	80 ^{639.8} 512.2	107687	102 96 102 95	107 ₁₀₃ 106 ₁₀₁	100 97 100 96	⁹⁶ 89	95 88	98 89 89	91 89 89	86 84
	1200	402.9	540	93	100	94	87	87	88	87	82
	1100	310.3 AUST S2913102d	416 Proseuro Da	92 (OBCE)	99 Dict	93 anceno	86 7 Mete	86 ers (8623	87 .0 Fe9est)	86 80	81 76
	900	170.0	228	` <u>a</u> n´	08	00	96		84	70	75
	ENGINE	ENGINE 119.4	ENGINE 160	OVERÅ	125 ₉₇	250 ₈₈	500 85	1000 ₈₄	2000 ₆₃	4000 ₇₈	8000 ₇₄
	SPEEP00	POWER 80.0	POWER 107	88	HZ 96	HZ 87	HZ 84	HZ 83	HZ 82	HZ 77	HZ 73
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600 1500	955.0 786.9	1,281 1.055	99 97	106 105	100 99	91 90	91 89	92 90	92 91	88 86
	1400	639.8	858	96	103	97	88	88	89	90	85
	1300	512.2	687	95	101	96	89	88	89	89	84
	1200	402.9	540	93	100	94	87	87	88	87	82
	1100	310.3	416	92	99	93	86	86	87	86	81
	1000 900,600	233,2 170,000	313 228	91 90 92	99 98 100	90 89 94	87 86 85	86 85 84	85 84 85	80 79 86	76 75 81
	900 ¹⁶⁰⁰ 800 ¹⁵⁰⁰ 700 ¹⁴⁰⁰	110786.9	²²⁰ 055	en 91	07 98	₉₀ 92	85 83	₈₁ 83	₉₃ 84	79 84	74 80
	7001400	e039.8	2281 228055 160 858 107 687	₂₂ 89	9/	97 91	_{Q1} δ2	₂₂ 81	en 82	77 03	73 /8
	1300	402.9	687 540	88 87	90 95 93	67 89 88	⁰⁴ 82 81	⁰³ 82 81	⁰² 83 81	′′ 82 81	⁷³ 77 76
	1100	310.3	416	86	92	87	80	79	80	80	70
		AUST Szaund		ta (OB65F)		ance#4	15 Mete		.2 Foret)	74	69
	900 ENGINE00	ENGINE 170.0 119.4	ENGINE 228 160		125 ₉₁	250 ₈₂	500 ₇₉	78 1000 ₇₇	77 2000 ₇₇	72 4000 ₇₂	8000 ₆₇
	SPEEP00	POWER 80.0	POWER 107	82	HZ 90	нz ₈₁	HZ 78	HZ ⁷⁶	HZ 76	HZ 71	HZ 67
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	955.0	1,281	92	100	94	85	84	85	86	81
	1500	786.9	1.055	91	98	92 01	83	83	84	84	80 79
	1400 1300	639.8 512.2	858 687	89 88	97 95	91 89	82 82	81 82	82 83	83 82	78 77
	1200	402.9	540	87	93	88	81	81	81	81	76
	1100	310.3	416	86	92	87	80	79	80	80	75
	1000	233.2	313	85	93	84	81	79	79	74	69
	900	170.0	228	83	91	82	79 70	78 77	77	72	68 67
	800 700	119.4 80.0	160 107	83 82	91 90	82 81	79 78	77 76	77 76	72 71	67 67
	100	00.0	107	02	50	01	10	10	10	/ 1	01

Sound Performance Number:

Per	formance Number	: DM9232	Ch	ange Level:	00					
Sales Model: 351200	955.0	1,281	103	99	Ra%êd	Speed (F	2PM)-981	600 98	96	100
Application: MAR1400		1,055	102	98	Poted	Power ₃ (B	KM.97 0	55 0 ⁹⁷	95	99
			102	97	Raieu	Foweg ₃ (D	KW): ₉₆ 9	97 97	95	98
Rating Level: A RAST	•		, -	98		Power (E			93	97
1200	402.9	540 416	101	97	94 94	90 89	95	96 05	93 92	96
1100 MEGH	ANICAL Sound F		100 ta (OBGE)	96 DAista	anceg3	1 Magte	94 rs (₉₄ 3.3	95 3 Feget)	92 91	95 95
	170.0	228								~ ~ ~
		INGINE 160	OVERAL	125 _{OF}	250 92 92	500 _{o o}	1000 ₉₂	2000	4000	8000
SPEEP00	POWER 80.0	POWER 107	97	н г ₉₄	нz ₉₁	۳۲ 87	н z ₉₂	нz ₉₃	нz ₉₀	нz ₉₃
RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
1600	955.0	1.281	103	99	98	95	98	98	96	100
1500 1400	786.9 639.8	1.055 858	102 102	98 97	97 96	94 93	97 96	97 97	95 95	99 98
1400	512.2	687	102	98	90 95	93 91	90 96	96	93 93	90 97
1200	402.9	540	101	97	94	90	95	96	93	96
1100	310.3	416	100	96	94	89	94	95	92	95
1000	233.2 170.955.0	313 228,281	99 00 91	96 05 87	93 02 86	89 83	94 02 86	95 04 86	91 01 84	95 04 88
9001600 8001500	440 680.9	228,201 160,055	99 00	95 00	92 05	00 00	93 05	94 05	91 02	94 07
7001400	80.012 2	160 ^{,858} 107 ^{,858}	98 90 97 90	95 86 94 85	92 85 91 84	88 ⁸² 87 81	92 85 92 84	93 85 93 85	90 83 90 83	94 87 93 87
1300	512.2	687	89	86	83	⁰⁷ 79	84	85	81	⁹³ 85
1200	402.9	540	89	85	82	78	83	84	81	84
1100 ΜΓ ርሐ	310.3 ANICAL Sound F	416 Pressure: Da	88 (OBQF)	84 Dista	82 ances1	77 7 Maerte	82 rs (8 23 .	83 0 Feeet)	80 80	83 83
		228				500 76 76	1000 ⁸¹			
SPEEP00	119.4	Image Image <th< td=""><td></td><td>125 83 83</td><td>250⁸⁰₈₀</td><td>⁵⁰⁰76</td><td>1000₈₁</td><td>2000⁸²</td><td>400079 78</td><td>8000⁸²</td></th<>		125 83 83	250 ⁸⁰ ₈₀	⁵⁰⁰ 76	1000 ₈₁	2000 ⁸²	4000 79 78	8000 ⁸²
RPM	BKW	BHP	85 DB(A)	HZ 82 DB	HZ ₇₉ DB	HZ 75 DB	HZ 80 DB	HZ 81 DB	HZ 78 DB	HZ 81 DB
1600	955.0	1,281	91	87	86	83	86	86	84	88
1500	786.9	1.055	90	86	85	82	85	85	83	87
1400	639.8	858	90	85	84	81	84	85	83	87
1300	512.2	687	89	86	83	79	84	85	81	85
1200	402.9	540	89	85	82	78	83	84	81	84
1100 1000	310.3	416 313	88 87	84 84	82 81	77 77	82 82	83 83	80 80	83 83
aaa1600	233.2 170.955.0	- 1 281	₈₇ 85	₈₃ 81	80 ⁸⁰	76 77	₈₁ 80	₈₂ 80	79 78	₈₂ 82
0001000	119 480.9	10000	86 ⁸⁵	83 ⁸⁰	80 ⁷⁹	76 76	81 ⁷⁹	₂₁ 80	78 78	82 ⁸¹
800 700 ¹⁴⁰⁰ 1300	80.039.8 512.2	107 858 107 687	85 84 83	82 80 82 80	79 79 79 77	75 76 75 73	80 79 78	81 79 81 79 79	78 77 78 76	81 81 79
1200	402.9	540	83	79	77	73	78	79 78	76	79
1100	310.3	416	82	79	76	72	77	78	74	78
		Pressure ₃ Da			ance ₇₅	15 Mete	•		74	77
ENGINE00	ENGINE 170.0 119.4	ENGINE 228 160		125 ⁷⁷ 77	250 ⁷⁵ 74	500 ⁷⁰ 70	1000 ⁷⁵ 75	2000 ⁷⁶ 76	4000 ₇₂ ⁷³	8000 ⁷⁶ 76
SPEEP	POWER 80.0	POWER 107	80	HZ 76	нz ₇₃	нz ₆₉	HZ 74	HZ 75	HZ 72	HZ 75
RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
1600	955.0	1.281	85	81	80	77	80	80	78	82
1500 1400	786.9	1.055 858	85 84	80 80	79 79	76 76	79 79	80 79	78 77	81 81
1300	639.8 512.2	687	83	80 80	79 77	76 73	79 78	79 79	76	79
1200	402.9	540	83	79	77	72	77	78	75	78
	402.9									
1100	310.3	416	82	79	76	72	77	78	74	78
1000	310.3 233.2	416 313	82 82	78	75	71	76	77	74	77
1000 900	310.3 233.2 170.0	416 313 228	82 82 81	78 77	75 75	71 70	76 75	77 76	74 73	77 76
1000	310.3 233.2	416 313	82 82	78	75	71	76	77	74	77

	Performa	ance Numbe	r: DM9244	Cha	ange Level:	02					
Sales Model:	3512800	1,678.0	2,250	117	122	Ratied	Speed (RF	M)1081	800 110	110	108
Application:		14236	1,896	115	120	Pa116	Power BK	107 ₁	678 ¹⁰⁸	108	106
Application.			1,580	114	119	Rateu Datad	FOWeby Dr	105 ['] ,	250 107	107	104
Rating Level:			. ,	112	117		Power5(Bl			106	103
	1400 1300	789.5 632.1	1,059 848	111 109	116 114	111 109	104 102	102 101	104 104	104 102	101 100
			Pressure ₆ D/at		₁₽jst a		1.5 Meters			101	99
F	NGINE E	NGINE 383.0	ENGINE 514	OVERALL	125 112	250 107	500 ¹⁰⁰ ₉₉	1000 ⁹⁸ 98	2000 101	4000 94	8000 ⁹⁸ 90
	SPEE	201.1	POWER 281	105	HZ ₁₀₈	HZ ₁₀₂	HZ 98	HZ 97	HZ ₁₀₀	HZ 93	HZ 89
	RPM800	BKW 147.3	BHP 198	DB(A)03	DB107	DB101	DB 97	DB 96	DB 99	DB 92	DB 88
	1800700	1.678.098.7	2.250 132	117 102	122 106	118 100	110 96	108 95	110 98	110 91	108 87
	1700	1.413.6	1.896	115	120	116		107	108	108	106
	1600	1,178.5	1.580	114	119	114		105	107	107	104
	1500 1400	971.1 789.5	1.302 1,059	112 111	117 116	113 111		104 102	105 104	106 104	103 101
	1300	632.1	848	109	114	109		101	104	102	100
	1200	497.2	667	108	113	108	101	99	102	101	99
	1100	383.0	514	107	112	107	100	98	101	100	98
	1000 900 ¹⁸⁰⁰	287.7 209.878.0	386 28 ² ,250	105 104 104 102	109 108 112 110	103 102 106 104	99 98 97	98 97 96	101 100 96	94 93 96	90 89 93
	ano ¹⁷⁰⁰	147,313.6	198,896			404 107	97 95	96 ⁹⁴	99 95	93 92 94	89 88 92
	7001000	98.778.5	132,000	102 100	106 100	100 102	96 ⁹³	95 ⁹²	98 ⁹³	91 ⁹⁴	87 ⁸⁹
	1500 1400	971.1 789.5	¹ ,302 1,059	99 97	100 106 105	100 100 99	91 90	91 89	92 90	92 91	88 86
	1300	632.1	848	97 96	105	99 97	90 90	89 90	90 90	90	85
			Pressure			ance 35	7 Meeters		0 Feget)	88	83
E		NGINE 383.0	ENGINE 514		125 ¹⁰⁰ ₁₀₀	250 94 91	500 ⁸⁷ 88	1000 ⁸⁷ 86	2000 ⁸⁸ 86	4000 ⁸⁷ 81	8000 ⁸² 77
	SPEEQ ₀₀ F	201.1	POWER 281	92- 91	HZ 99	HZ 90	HZ 88 HZ 87	HZ 85	HZ 85	HZ 80	HZ 76
	RPM800	BKW 147.3	BHP 198	DB(A9)0	DB 98	DB 89	DB 86	DB 84	DB 84	DB 79	DB 75
	1800700	1,678.098.7	2,250 132	104 89	112 97	106 88	97 85	96 83	96 83	96 78	93 74
	1700	1.413.6	1.896	102	110	104	95	94	95	94	92
	1600	1,178.5 971.1	1.580	100	108 106	102 100	93 91	92 91	93 92	94 92	89 88
	1500 1400	789.5	1.302 1.059	99 97	105	99	90	89	92 90	92 91	86
	1300	632.1	848	96	102	97	90	90	90	90	85
	1200	497.2	667	94	101	95	88	88	89	88	83
	1100	383.0	514	93	100	94	87	87	88	87	82
	1000 9001800	287.7 204,678.0	386 281,250	92 91 97	100 99 105	91 90 99	88 87 90	86 85 89	86 85 90	81 80 ⁸⁹	77 76 87
	0001/00	$147.3^{209.0}$	101.896	90 ⁹⁵	₉₈ 103	89 ⁹⁷	86 89	84 ⁸⁷	84 88	79 ⁸⁸	75 ⁸⁵
	7001000	98, 1 78.5	132,000	89 ⁹⁴	97 ¹⁰¹	88 95	85 86	83 ⁸⁶	83 ⁸⁷	78 ⁸⁷	74 ⁸³
	1500 1400	971.1 789.5	1,302	92 91	100 98	94 92	85 83	84 83	85 84	86 84	81 80
	1300	632.1	848	89	96	90	83	83	84	83	78
			Pressure ₆ D/at	a (OBQ₽)		ance ₈ 9	15 Meters		2 Feget)	82	77
E	NGINE E	NGINE 383.0	ENGINE 514		125 93 93	250 88 84	500 ⁸¹ 81	1000 ⁸⁰ 80	2000 ⁸¹ 79	4000 ⁸¹ 74	8000 ⁷⁶ 70
:	SPEE	POWER 287.7	POWER 281	85 84	нz ₉₃	нz 84 83	HZ 81	HZ 79	нz ₇₈	нz 74 73	нz ₆₉
	RPM800	BKW 147.3	BHP 198	DB(Ag)3	DB 91	DB 82	DB 79	DB 78	DB 77	DB 72	DB 68
	1800700	1.678.098.7	2.250 132	97 82	105 90	99 81	90 78	89 77	90 76	89 71	87 67
	1700	1,413.6	1.896	95	103	97	89	87	88	88	85
	1600 1500	1.178.5 971.1	1.580 1,302	94 92	101 100	95 94	86 85	86 84	87 85	87 86	83 81
	1400	789.5	1.059	92 91	98	94 92	83	64 83	84	84	80
	1300	632.1	848	89	96	90	83	83	84	83	78
	1200	497.2	667	88	94	89	82	82	82	82	77
	1100	383.0	514	87	93	88	81	80	81	81	76
	1000	287.7	386	85 84	93 02	84 83	81 80	80 70	79 78	74 73	70 69
	900 800	209.8 147.3	281 198	84 83	92 91	83 82	80 79	79 78	78 77	73 72	69 68
	700	98.7	132	82	90	81	78	77	76	71	67

Sound Performance Number:

	Performance	Number: DM9	244	Change Leve	l: 02					
Sales Model: 35	11200	1,678.0 2	,250 104	4 99	Ráted	Speed (R	PM) 99 1.8	300100	98	102
Application: MA	BINE PROPU		,896 104		Pated	Power (Bł	⁹⁹ 1 6	378 ¹⁰⁰	97	101
Boting Lovely R		1,178.5 1	,580 103		Detad	Poweer (B	100 = 2	250.98	96	100
Rating Level: B-F	1400 (TEA)		,302 102		Kaji/eu 96	РОЖ947 (Б 93	ע,∠ חד) 96	230 97 97	95 95	99
	1300	632.1	,059 102 848 101		90 95	93 91	90 96	97 96	95 93	98 97
		Sound Pressur	🗑 🗗 ata (OB 🏟 F	F) jõpi	stanc@4	1 Meters	s (95 3.3	Feyet)	93	96
ENGI	1100 NE ENGIN	E 287.7 ENGINE	514 OVER	L 125 ⁹⁶	250 ₉₃	500 89	94 1000 ₉₄	2000 ₉₅	4000 ₉₁	8000 ₉₅
SPE		ER 209.8 POWER		117	HZ ₉₂	HZ ₈₈	HZ ₉₃	HZ ₉₄	HZ ₉₁	нz ₉₄
RPI	900 BKW	209.8 V 147.3 BHP	281 99 198 DB(§)8		92 DB92	00 DB88	93 DB 92	94 DB93	DB90	0894 DB94
	0700 1.6	578.098.7 2.250			100 91	98 87	99 92	100 93	98 90	102 93
170		13.6 1,896		98	99	97	99	100	97	101
160		78.5 1,580		99	98	95	98	98	96	100
150		071.1 1.302		98	97	94	97	97	95	99
140		789.5 1.059		97	96 05	93	96	97 06	95	98 97
130 120		632.1 848 197.2 667		98 97	95 94	91 90	96 95	96 96	93 93	97 96
110	0 3	83.0 514	100	96	94	89	94	95	92	95
100		287.7 380 36678.0 28^{2}	3 99	96	93	89	94 02 87	95	91	95
900	1000 2	$209.8^{0.0}_{1.113.6}$ 28		90 86	92 88 97 87	88 86 88 85	93 87	94 ⁸⁸ 93 88	91 86 91 85	94 90 94 90
800	1700 1 1600 1		580 98 91 580 97 91	95 80 04 87	92 80 92 87 91 86	88 00 87 83	93 87 92 86 92 86	90 oc	90	94 00
700)1600 1500	907 1.37	302 97 90	94 87 86	91 ⁸⁰ 85	87 ⁸³ 82	92 85 85	93 80 85	90 ⁸⁴ 83	93 80 87
	1400		,059 90	85	84	81	84	85	83	87
		632.1	848 89		83	79 7 Matar	84	85	81	85
		Sound Pressur			stance ₂	7 Meters	• • •	Feget)	81	84
ENGI	NEOO ENGIN	NE 287.7 ENGINE	⁵¹⁴ 386 OVER ⁸⁸ / ₈₇	.L 125 ⁸⁴	250 82 81	500 ⁷⁷	1000 ₈₂	2000 ⁸³	4000 80	8000 ⁸³
SPE	Ego POWE		281 87	HZ ₈₃	нz ₈₀	н z ₇₆	HZ ₈₁	нz ₈₂	HZ ₇₉	HZ 82
	M800 BKW	V 147.3 BHP	198 DB(A)6		DB 80	DB76	DB 81	DB81	DB78	DB82
		78.098.7 2.250			88 79	86 75	87 80	88 81	86 78	90 81
170		13.6 1.890		86	87	85	87	88	85	90
160 150		78.5 1,580 971.1 1.302		87 86	86 85	83 82	86 85	86 85	84 83	88 87
140		789.5 1.059		85	84	81	84	85	83	87
130		32.1 848		86	83	79	84	85	81	85
120		97.2 667		85	82	78	83	84	81	84
110		883.0 514		84	82					
100	0 2	287.7 386		. .		77	82	83	80	83
000	1800 -	1678.0 <u>2</u>	250 87 87	84 82 81	81 。	77 76 80	82 01	83 。2	80	83 🗛
0.00	1800 2 1700 4	$209.878.0$ 28^{2} 2174313.6 105	250 87 87	83 81	81 80 82	77 76 80 76 79	82 81 81 81 81	83 82 83 81 82	80 79 80 78 80	83 82 84 82 84
0.00	ე800 2 ე700 1 ე600 1	47.3 198 98.478.5 198	580 86 85	83 81 83 81 82 81	81 80 82 80 81 79 80	77 76 80 76 79 76 77	82 81 81 81 81 80 80	83 82 83 81 82 81 80	80 79 80 78 80 78 78	83 82 84 82 84 81 82
800 700	3800 2 3700 1 3600 1500	47433.6 194 98178.5 134 971.1 1	580 85 302 85	83 81 83 81 82 81 80	81 80 82 80 81 79 80 79	77 76 80 76 79 76 77 75 77 76	82 81 81 81 81 80 80 79	83 82 83 81 82 81 80 81 80 80	80 79 80 78 80 78 78 78 78	83 82 84 82 84 81 82 81
800 700	1800 2 1700 1 1600 1500 1400	4743.3.6 19 98478.5 13 971.1 13 789.5 1	896 86 86 580 85 85 302 85 ,059 84	83 81 83 81 82 81 80 80	81 80 82 80 81 79 80 79 79 79	77 76 80 76 79 75 77 75 76 76 76	82 81 81 81 80 79 79	83 82 81 81 80 80 79	80 79 80 78 80 78 78 78 78 78 77	83 82 82 84 82 81 81 81 81
800 700	3800 2 3700 1 3600 1 1500 1400 1300	4745 ^{3.6} 19 98178.5 13 971.1 1 789.5 1 632.1	896 86 85 580 85 85 302 85 85 ,059 84 83	83 81 83 81 82 81 80 80 80 80	81 80 82 80 81 79 80 79 79 79 79 77	77 76 80 76 79 75 77 76 76 76 73	82 81 81 81 81 80 79 79 78	83 82 81 82 81 80 79 79	80 79 80 78 80 78 78 78 78	83 82 84 82 81 81 81 79
800 700 N	3800 2 3700 1 3600 1 1500 1400 1300 EQHANICAL	474,13.6 19 98,178.5 13 971.1 1 789.5 1 632.1 Sound Pressur	896 86 86 580 85 85 302 85 059 84 848 83 €⊕ata (OB€	83 81 83 81 82 81 80 80 80 *) 70	81 80 81 79 79 79 79 79 79 77 stancq7	77 76 80 76 79 75 77 76 76 73 15 Meters	82 81 81 81 81 80 79 79 78 5 (7 49.2	83 82 81 82 81 80 80 79 79 79 Feet)	80 79 80 78 80 78 78 78 78 78 77 76 75	83 82 84 82 81 81 81 79 78
800 700 N ENGI	3800 2 3700 1 3600 1 1500 1400 1300 ₩20HANICAL 1100 ₩500 ENGIN	47733.6 19 98778.5 13 971.1 1 789.5 1 632.1 Sournod Pressur ⊮E 202.7 ENGINE	896 86 85 580 85 85 302 85 85 059 84 83 60 Data (OB 63) 514 85 514 0VER 82 386	83 81 83 81 82 80 80 F) 70 L 12577	81 80 81 79 79 79 77 stanc q 76 250 75	77 76 79 75 77 76 73 15 Meters 50071	82 81 81 80 80 79 79 78 (77 49.2 77 1000 7 6	83 82 81 80 81 80 79 79 79 Feret) 2000,7	80 79 78 78 78 78 78 77 76 75 74 4000 ₇₄	83 82 84 82 81 81 81 79 78 800077
800 700 N ENGI SPEI	3800 2 3700 1 3600 1 1500 1400 1300 MEQHANICAL 1100 ENGIN E900 POWE	4743.56 19 98178.5 13 971.1 13 971.1 13 971.1 13 971.1 13 971.1 13 971.1 13 971.1 13 632.1 13 632.1 Pressur 18 287.7 ENGINE ER 209.8 POWER	896 86 85 580 85 85 302 85 85 (059 84 83 848 83 86 514 (OBG) 81 514 0VER 82 83 386 0VER 82 81	83 81 83 81 82 81 80 80 F) 70 L 12578 HZ 77	81 80 81 79 79 79 77 stance7 250 75 HZ 75	77 76 79 75 76 73 76 73 15 Meters 500 71 HZ 70	82 81 81 80 79 79 78 5 (77 49.2 100076 HZ 75	83 82 81 80 79 79 Feret) 2000 77 HZ 76	80 79 80 78 78 78 78 77 76 75 4000 74 4000 74 HZ 73	83 82 84 82 81 81 81 79 78 800077 HZ 76
800 700 N ENGI SPEI RPI	3800 2 3700 1 3600 1 1500 1400 1300 HEQHANICAL 100 ENGIN E900 POWE №00 BKW	4743.56 19 98178.5 13 971.1 13 971.1 13 971.1 13 971.1 13 632.1 Sound Pressur 383.0 IE 287.7 ENGINE ER 209.8 POWER V 147.3 BHP	896 86 85 580 85 85 302 85 85 059 84 83 60 ata (OB 61) 514 08 514 0VER 82 386 281 81 198	83 81 83 81 82 81 80 80 5) 70 12578 HZ 77 DB77	81 80 81 79 79 79 77 stance7 75 4250 75 HZ 75 DB 74	77 76 76 77 75 76 76 73 75 76 76 73 75 Meters 500 71 HZ 70 DB 70	82 81 81 80 79 78 (77 49.2 1000 76 HZ 75 DB 75	83 82 81 80 79 79 Feret) 2000 77 82000 77 HZ 76 DB 76	80 79 80 78 78 78 78 77 76 75 74 4000 74 HZ 73 DB 72	83 82 84 82 81 81 79 78 800077 HZ 76 DB 76
800 700 N ENGI SPEI RPI	3800 2 3700 1 3600 1 1500 1400 1300 ₩20HANICAL 1100 ₩20HANICAL 1100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL 100 ₩20HANICAL ₩ 00 № 000 № 000 № 000 № 000 № 000 № 000 № 000 № 0000 № 000 № 0000 № 000000000000000000000000000000000000	4743.5.6 19 98178.5 13 971.1 1 789.5 1 632.1 Sound Pressur 383.0 IE 287.7 ENGINE ER 209.8 POWER √ 147.3 BHP 578.098.7 2.250	896 86 85 580 85 85 302 85 85 0059 84 84 848 83 86 607 ata ODEGI 81 281 81 81 198 DB(60) 1132 87	83 81 83 81 82 81 80 80 5) 70 12578 HZ 77 DB77	81 80 81 79 79 79 77 stance7 250 75 HZ 75	77 76 79 75 76 73 76 73 15 Meters 500 71 HZ 70	82 81 81 80 79 79 78 5 (77 49.2 100076 HZ 75	83 82 81 80 79 79 Feret) 2000 77 HZ 76	80 79 80 78 78 78 78 77 76 75 4000 74 4000 74 HZ 73	83 82 84 82 81 81 81 79 78 800077 HZ 76
800 700 ENGI SPEI 	3800 2 7700 1 1600 1 1500 1 1400 1 1300 EQHANICAL 1100 ENGIN 1500 ENGIN 1500 ENGIN 1500 ENGIN 100 ENGIN 100 ENGIN 100 1.6 100 1.4 10 1.4	4743.56 19 987478.5 13 971.1 1 789.5 1 632.1 1 Sourced Pressur 16 287.7 18 287.7 287.7 ENGINE 578.09.8 POWER V 147.3 178.09.7 2.256 13.6 1.899 78.5 1.580	896 86 85 580 85 85 302 85 80 059 84 83 607ata (OBG) 84 83 514 0VERG 82 281 81 198 DB(4b) 1132 87 80 6 86 85 86	83 81 83 81 82 81 80 80 5) 70 12 12578 HZ 77 DB77 81 76	81 80 81 79 79 79 79 77 550 75 HZ 75 DB 74 82 73	77 76 76 77 75 76 76 73 75 76 73 75 76 73 75 Meters 500 71 HZ 70 DB70 80 69	82 81 81 81 80 79 79 78 77 100076 HZ 75 DB 75 81 74	83 82 81 81 80 79 79 Feet) 2000/7 HZ 76 DB 76 83 75	80 79 80 78 78 78 78 78 77 76 75 75 74 400074 HZ 73 DB 72 80 72	83 82 84 82 84 81 81 79 78 800077 HZ 76 DB 76 84 75
800 700 ENGI SPEI <u>RPI</u> 1800 170 160 150	3800 2 3700 1 3600 1 1500 1 1400 1300 1300 HEOHANICAL 1100 ENGIN 1500 ENGIN 100 BKW 000 BKW 000 1.6 00 1.4 00 1.1 00 9	4743.5.6 19 9874.5.5 13 971.1 1 789.5 13 632.1 Sourcd Pressur 16 287.7 ENGINE ER 209.8 POWER √ 147.3 BHP 578.098.7 2.250 113.6 1.890 78.5 1.580 071.1 1.302	896 86 85 5580 85 85 302 85 80 3059 84 83 €Jata (OB€) 84 83 €Jata (OB€) 84 83 €Jata (OB€) 98 98 281 81 198 DB(♠) 1132 87 80 5 86 85 85	 83 81 83 81 82 81 80 80 700i 700i 12578 HZ 77 DB77 81 76 81 81 80 	81 80 81 80 79 79 79 79 77 stance 7 stance 7 stance 7 stance 7 850 75 HZ 75 DB 74 82 73 81 80 79	77 76 76 77 75 76 73 75 76 73 75 76 73 75 76 72 70 71 HZ 70 DB70 80 69 79 77 76	82 81 81 81 80 79 79 77 77 1000 76 HZ 75 DB 75 81 74 81 80 79 77 1000 76 17 1000 76 17 17 1000 76 17 1000 76 17 1000 76 17 1000 76 17 1000 76 10 10 10 10 10 10 10 10 10 10	83 82 81 80 79 79 Feret) 2000 77 HZ 76 DB 76 83 75 82 80 80	80 79 80 78 80 78 78 78 78 77 76 75 74 400074 HZ 73 DB 72 80 72 80 78 78	83 82 84 82 84 81 81 79 78 78 800077 HZ 76 DB 76 84 75 84 82 81
800 700 ENGI SPE 180 170 160 150 140	3800 2 7700 1 1600 1 1500 1 1400 1 1300 HEQHANICAL 1100 ENGIN 1500 ENGIN 100 ENGIN 100 ENGIN 100 ENGIN 100 1.6 100 1.4 100 9 100 7	4743.0 19 98178.5 19 98178.5 13 971.1 13 971.1 14 789.5 1 632.1 Source Pressur 383.0 ENGINE 287.7 FOWER 147.3 BHP 78.08.7 2.256 13.6 1.896 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.580 78.5 1.058	896 86 85 550 85 85 302 85 85 059 84 83 607ata (OBGI) 81 83 514 0768 82 386 0748 82 281 81 198 198 DB(A) 1132 87 80 86 0 85 85 0 85 84	 83 81 83 81 82 81 80 80 70i 779i 779 770 770<td>81 80 81 80 79 79 79 79 79 79 75 stance7 stance7 stance7 stance7 b74 82 73 81 80 79 79 79 79</td><td>77 76 76 77 75 76 76 73 72 72 500 71 HZ 70 DB70 80 80 69 79 77 76 76 77</td><td>82 81 81 81 80 79 79 78 77 1000/6 HZ 75 DB 75 81 74 81 80 79 79 79 79 78 77 1000/6 HZ 75 79 79 79 79 79 78 79 78 79 79 78 78 78 79 78 78 78 78 78 78 78 78 78 78</td><td>83 82 81 81 80 79 79 Feret) 2000 77 HZ 76 DB76 83 75 82 80 80 79</td><td>80 79 80 78 78 78 78 77 76 75 75 74 400074 HZ 73 DB 72 80 78 78 77 78 78 77</td><td>83 82 84 82 84 81 81 79 78 8000 77 HZ 76 DB76 84 75 84 82 81 81</td>	81 80 81 80 79 79 79 79 79 79 75 stance 7 stance 7 stance 7 stance 7 b 74 82 73 81 80 79 79 79 79	77 76 76 77 75 76 76 73 72 72 500 71 HZ 70 DB70 80 80 69 79 77 76 76 77	82 81 81 81 80 79 79 78 77 1000/6 HZ 75 DB 75 81 74 81 80 79 79 79 79 78 77 1000/6 HZ 75 79 79 79 79 79 78 79 78 79 79 78 78 78 79 78 78 78 78 78 78 78 78 78 78	83 82 81 81 80 79 79 Feret) 2000 77 HZ 76 DB76 83 75 82 80 80 79	80 79 80 78 78 78 78 77 76 75 75 74 400074 HZ 73 DB 72 80 78 78 77 78 78 77	83 82 84 82 84 81 81 79 78 8000 77 HZ 76 DB76 84 75 84 82 81 81
800 700 ENGI SPE RPI 180 170 160 150 130 130	3800 2 7700 1 1600 1 1500 1 1400 1 1300 BEQHANICAL 1100 ENGIN 1500 ENGIN 100 ENGIN 100 ENGIN 100 BKW 100 1.6 100 1.4 10 1.1 10 9 100 7 10 7 10 6	4743.5 19 98178.5 13 971.1 13 971.1 13 971.1 14 789.5 1 632.1 Sound Pressur 383.0 ENGINE 287.7 FOWER 209.8 POWER 147.3 BHP 578.098.7 2.250 13.6 1.890 78.5 1.580 971.1 1.305 389.5 1.056 332.1 848	896 86 86 85 580 85 85 302 85 3059 84 83 86 90 84 83 600 84 83 80 90 84 83 86 90 84 83 86 90 84 83 83 80 90 84 83	 83 81 83 81 82 81 80 80 70 72 72 73 74 75 76 76 76 76 76 81 76 81 80 80 80 80 80 80 	81 80 81 80 79 80 79 79 79 77 stance 7 stance 7 stance 7 stance 7 b 77 b 75 HZ 75 b 74 82 73 81 80 79 79 79 79 77	77 76 76 77 75 76 76 73 73 75 76 76 70 71 HZ 70 DB70 80 69 79 77 76 76 73	82 81 81 81 80 79 79 78 77 1000/6 HZ 75 DB 75 81 74 81 80 79 78 77 1000/6 HZ 75 79 79 79 78 77 78 77 78 77 78 78 77 78 78	83 82 81 81 80 79 79 Peret) 2000 77 HZ 76 DB76 83 75 82 80 80 79 79 79	80 79 80 78 78 78 78 78 77 76 4000 74 HZ 73 DB72 80 78 78 78 77 76	83 82 84 82 84 81 81 79 78 800077 HZ 76 DB 76 84 84 75 84 81 81 79
800 700 ENGI SPEI 	3800 2 7700 1 3600 1 1500 1 1400 1 1300 BEQHANICAL 1100 ENGIN 1400 ENGIN 100 ENGIN 100 ENGIN 100 ENGIN 100 1.6 100 1.6 100 1.4 10 9 10 7 10 6 10 4	4743.5 19 98178.5 13 971.1 13 971.1 1632.1 Sound Pressur 18287.7 ENGINE 209.8 POWER 147.3 BHP 378.098.7 2.256 13.6 1.896 771.1 1.302 389.5 1.053 389.5 1.054 389.5 1.054 389.5 1.054 39.5 1.054 1071.1 844 107.2 645	896 86 85 550 85 85 302 85 85 3059 84 83 607ata OVERAL 81 514 OVERAL 81 281 81 81 198 DB(A) 86 2 85 86 3 86 85 3 86 85 3 83 7	 83 81 83 81 82 81 80 80 70 72578 7279 72578 7279 7270 7270 7270 7270 7270 7270 7270 7270 7200 800 800 800 79 	81 82 80 81 79 80 79 79 77 stance7 50 75 HZ 75 DB 74 82 73 81 80 79 79 77 77	77 76 76 77 75 76 73 75 76 73 75 76 73 75 70 70 70 70 70 70 70 70 70 70	82 81 81 81 80 79 79 78 1000 /6 HZ 75 DB 75 81 74 81 80 79 77 78 77 1000 76 77 75 76 77 77 78 77 78 77 78 77 78 77 78 77 78 77 78 77 78 77 78 77 78 77 78 77 78 77 78 77 78 77 78 77 78 77 78 77 78 77 78 77 77	83 82 81 81 80 79 79 Feet) 2000/7 HZ 76 DB 76 83 75 82 80 80 79 79 78	80 79 80 78 78 78 78 78 77 76 75 74 400074 HZ 73 DB72 80 78 78 78 77 76 75	83 82 84 82 84 81 81 79 78 800077 HZ 76 DB 76 84 84 82 81 81 79 78
800 700 ENGI SPE RPI 180 170 160 150 130 130	3800 2 7700 1 3600 1 1500 1 1300 1300 1200 ENGIN 1200 ENGIN 1200 ENGIN 1200 ENGIN 1200 ENGIN 1200 ENGIN 100 ENGIN 100 1.6 100 1.4 100 7 100 6 100 4 100 3	4743.5 19 98178.5 13 971.1 13 971.1 13 971.1 14 789.5 1 632.1 Sound Pressur 383.0 ENGINE 287.7 FOWER 209.8 POWER 147.3 BHP 578.098.7 2.250 13.6 1.890 78.5 1.580 971.1 1.305 389.5 1.056 332.1 848	896 86 85 550 85 85 302 85 85 0059 84 83 607ata OUERAT 281 81 198 DB(A) 91 85 2 86 0 85 2 85 86 85 3 86 85 86 3 85 84 83 4 83 83 83 4 82 83 83	 83 81 83 81 82 81 80 80 70 72 72 73 74 75 76 76 76 76 76 81 76 81 80 80 80 80 80 80 	81 80 81 80 79 80 79 79 79 77 stance 7 stance 7 stance 7 stance 7 b 77 b 75 HZ 75 b 74 82 73 81 80 79 79 79 79 77	77 76 76 77 75 76 76 73 73 75 76 76 70 71 HZ 70 DB70 80 69 79 77 76 76 73	82 81 81 81 80 79 79 78 77 1000/6 HZ 75 DB 75 81 74 81 80 79 78 77 1000/6 HZ 75 79 79 79 78 77 78 77 78 77 78 78 77 78 78	83 82 81 81 80 79 79 Peret) 2000 77 HZ 76 DB76 83 75 82 80 80 79 79 79	80 79 80 78 78 78 78 78 77 76 4000 74 HZ 73 DB72 80 78 78 78 77 76	83 82 84 82 84 81 81 79 78 800077 HZ 76 DB 76 84 84 85 84 81 81 79
800 700 ENGI SPEI 180 170 160 150 140 130 120 110	3800 2 3700 1 3600 1 1500 1 1400 1300 1300 ENGIN 1400 ENGIN 1500 ENGIN 1600 1.6 100 9 100 7 100 3 100 3 100 3 100 3	4743.5 19 98178.5 13 971.1 1 789.5 1 632.1 Source Source Pressur 12 287.7 287.7 ENGINE 209.8 POWER 147.3 BHP 78.98.7 2.250 13.6 1.890 78.5 1.580 971.1 1.302 789.5 1.053 332.1 844 97.2 665 983.0 514	896 86 85 550 85 85 302 85 85 3059 84 83 607ata (OBG) 0VERAT 81 514 0VERAT 81 281 81 81 198 DB(4) 1132 87 86 85 86 85 8 83 83 83 8 83 83 83 8 82 82 82	 83 81 83 81 82 81 80 80 700 12579 12577 12577 12577 12577 12577 12577 12577 12577 12578 12577 12579 12572 12572<td>81 82 80 81 79 79 79 77 55075 HZ 75 DB 74 82 73 81 80 79 79 79 77 77 77</td><td>77 76 76 77 75 76 73 75 76 73 75 76 70 71 HZ 70 DB70 80 69 79 77 76 76 73 72 72 72 72</td><td>82 81 81 80 79 78 (7749.2 77 100076 HZ 75 DB 75 81 74 81 80 79 79 78 77 77 81 74 81 80 79 77 77 77 77 77 77 77 77 77</td><td>83 82 81 81 80 79 79 Feet) 2000/7 HZ 76 DB 76 83 75 82 80 80 80 79 79 79 79 78 78</td><td>80 79 80 78 80 78 78 78 78 77 76 75 400074 HZ 73 DB 72 80 72 80 78 78 78 78 73 76 78 73 76 78 77 76 78 77 76 75 74 74</td><td>83 82 84 82 81 81 81 79 78 800077 HZ 76 DB76 84 84 82 81 81 79 78 78 78 78 78</td>	81 82 80 81 79 79 79 77 55075 HZ 75 DB 74 82 73 81 80 79 79 79 77 77 77	77 76 76 77 75 76 73 75 76 73 75 76 70 71 HZ 70 DB70 80 69 79 77 76 76 73 72 72 72 72	82 81 81 80 79 78 (7749.2 77 100076 HZ 75 DB 75 81 74 81 80 79 79 78 77 77 81 74 81 80 79 77 77 77 77 77 77 77 77 77	83 82 81 81 80 79 79 Feet) 2000/7 HZ 76 DB 76 83 75 82 80 80 80 79 79 79 79 78 78	80 79 80 78 80 78 78 78 78 77 76 75 400074 HZ 73 DB 72 80 72 80 78 78 78 78 73 76 78 73 76 78 77 76 78 77 76 75 74 74	83 82 84 82 81 81 81 79 78 800077 HZ 76 DB76 84 84 82 81 81 79 78 78 78 78 78
800 700 ENGI SPEI 1800 1700 1600 1500 1400 1300 1200 1100	3800 2 7700 1 1600 1 1500 1 1400 1300 HEQHANICAL 1100 NEO ENGIN MEO ENGIN MEO ENGIN MEO ENGIN MEO ENGIN MEO BKW 0700 1.6 00 1.4 00 9 00 7 00 4 00 2 00 2 00 2 00 2 00 2 00 2 00 2 00 2 00 1	4743.5 19 98178.5 13 971.1 1 789.5 1 632.1 Sourned Sourned Pressur 12 287.7 287.7 ENGINE 2827.7 POWER 147.3 BHP 778.098.7 2.256 13.6 1.899 78.5 1.580 71.1 1.302 32.1 844 97.2 666 383.0 514 383.0 514	896 86 85 550 85 85 502 85 85 059 84 83 607ata (OBGI 81 81 514 OVER 82 281 81 198 DB(A) 87 80 1132 87 80 85 2 85 84 83 3 83 83 83 4 82 83 83 5 82 81 80	 83 81 83 81 82 81 80 80 70i 12578 HZ 77 DB 77 81 76 81 80 80 80 80 80 79 78 	81 80 80 79 79 79 77 stance7 250 75 HZ 75 DB 74 82 73 81 80 79 79 79 79 77 77 76 75	$\begin{array}{cccc} 77 \\ 76 \\ 79 \\ 76 \\ 77 \\ 75 \\ 76 \\ 73 \\ 15 \\ \textbf{Mgters} \\ 500 \\ 71 \\ \textbf{HZ} \\ 70 \\ \textbf{DB} \\ 70 \\ 70 \\ 76 \\ 76 \\ 76 \\ 76 \\ 76 \\ 76$	82 81 81 81 80 79 79 78 (77 49.2 1000 76 HZ 75 DB 75 DB 75 81 74 81 80 79 79 78 5 77 77 75 75 75 75 77 75 77 75 77 75 77 75 77 77	83 82 83 81 80 79 79 Feret) 2000 77 HZ 76 DB 76 DB 76 83 75 82 80 80 79 79 79 78 77 78 77 78 77 78 77 78 77 78 77 78 78	80 79 80 78 78 78 78 78 77 76 75 74 400074 4 73 DB 72 80 72 80 72 80 78 77 76 78 77 76 78 77 76 75 74 74	83 82 84 82 81 81 81 79 78 800077 HZ 76 DB 76 0B 76 84 75 84 82 81 81 79 78 78 78 77

	Performance Number	: DM9245	CI	nange Level:	02					
Sales Model: 3512	BOD 1,763.5	2,365	117	122	Rátôd	Speét ⁰ (R	PM) 1091	R00110	110	108
		1,992	116	121	117 Pated	Power ₇ (Bl	¹⁰⁷	763 109	108	106
		1,661	114	119	Raugu	FOWER7(BI	106 ¹ ,	103-107	108	105
-	TOING (MAXIMUZOSCO	, ,		118		Power (B			106	103
	400 829.7 300 664.3	1,113 891	111 110	116 115	111 110	104 103	102 101	104 104	105 103	101 101
12	20 EXHAUST South F	ressuredat	a (OBÇÉ)			1.5 Meter			103	99
ENGIŅ		NGINE 540		112 125 110	250 107	500 100	1000 ₉₉	2000	400095^{100}	8000 ⁹⁸
SPEE	100 ENGINE ^{402.5} 500 ENGINE 302.4 E 60 POWER 220.4 F	400		125 110	250104	ощ ₀₀	HZ ₉₇	2000 HZ	4000 ₉₅ НZ ₉₃	ни 1000 ₉₀ ни 1000
RPMs		290	104 DB(40) 3	HZ ₁₀₈ DB ₁₀₇	HZ ₁₀₂ DB ₁₀₁	HZ 98 DB 97	DB 96	HZ ₁₀₀ DB99	DB92	DB88
1800	1.763.5	BHP 208 2.365	117		118	110	109	110	110	108
1700	1,485.6	1,992	116		117	109	103	109	108	106
1600	1,238.6	1,661	114		115	107	106	107	108	105
1500	1.020.5	1.369	113		113	106	104	106	106	103
1400	829.7	1,113	111		111	104	102	104	105	101
1300 1200	664.3 522.5	891 701	110 108		110 108	103 101	101 100	104 103	103 101	101 99
1100	100 5	E40		110						98
10018	80063.5	406303	107 106104	112 110 ¹¹²	107 104 ¹⁰⁶	100 98	00 96	100 91	95 97	90 ⁹⁴
		296992	106 104 104	108110	104^{100} 102^{105} 102^{102}	98 02	97 02	100 00	93 04	89 92 89 90
900 800 ¹	500 15428 500 1,020.5	208001	104 103 99	108 107 107 107	102 101 101 101	97 93 92	96 93 91	99 94 92	92 94 93	88 88
	400 829.7	1,113	98	105	99	90	90	91	91	87
	300 664.3	891	96	103	97	90	90	_ ⁹¹	90	85
	20 EXHAUST Soughd F		. ,			7 Meter	-	-	89	84
ENGIŅ	f_{00}^{100} ENGINE $\frac{402.5}{302.4}$ E	NGINE 406		125 ¹⁰⁰	250 ⁹⁴ 91	500 ⁸⁷ 88	1000 ⁸⁷	2000 ⁸⁸ 86	4000 ₈₁	8000 ₇₇
SPEE	p_{00}^{500} POWER ^{302.4}	OWER 296	92 91	нz ₉₉	нz ₉₀	нz ₈₇	нz ₈₅	нz ₈₅	нz ₈₀	н z 76
RPM8	BKW 154.8	BHP 208	DB(A)	DB98	DB89	DB86	DB 84	DB 84	DB79	DB75
1800	1.763.5	2.365	104	112	106	98	96	97	97	94
1700	1,485.6	1.992	102		105	96	94	95	95	92
1600 1500	1.238.6 1.020.5	1.661 1,369	101 99	108 107	102 101	93 92	93 91	94 92	94 93	90 88
1400	829.7	1.113	99 98	107	99	92 90	90	92 91	93 91	87
1300	664.3	891	96	103	97	90	90	91	90	85
1200	522.5	701	95	101	96	89	88	89	89	84
1100 1000	402.5 800 - 1763.5	540	93 97	100 100 ¹⁰⁵	94 01 100	87 91	87 87 89	88 90	87 90	82 77 87
000	/00485.0	406 296	92 97 91 96	100 ¹⁰⁰ 99 ¹⁰⁴	91 98 90 98	88 89 87 89	87 88 85 88	86 88 85 88	81 88	77 86 76 86
800	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	296 208661	91 90 ⁹⁴	98 102	⁹⁰ 96	86 87	84 ⁸⁶	85 84 87	80 88 79 88	75 83
1	500 1,020.5	1,369	93	100	94	85	85	86	86	82
	400 829.7 300 664.3	1,113 891	91 90	98 96	92 91	83 84	83 83	84 84	85 84	80 79
	20 EXHAUST Southed F				ances	15 Meter		2 Feeet)	82	75
		NGINE 540	OVER	125 ₉₄	250 ⁸⁸ 85	500 ₈₂	1000 ₈₀	2000 ₈₀	4000 75	8000 ₇₀
SPEE	POWER 220.4	296 POWER	84	HZ ₉₂	HZ ₈₃	HZ ₈₀	HZ ₇₉	HZ ₇₈	HZ ₇₃	HZ ₆₉
RPM	BKW 154.8	BHP 208	DB(AB)3	DB91	DB82	DB79	DB 78	DB77	DB72	DB68
1800	1,763.5	2.365	97	105	100	91	89	90	90	87
1700		1.992	96	104	98	89	88	88	88	86
1600 1500		1.661 1.369	94 93	102 100	96 94	87 85	86 85	87 86	88 86	83 82
1400		1.113	93 91	98	94 92	83	83	80 84	85	82 80
1300		891	90	96	91	84	83	84	84	79
1200	522.5	701	88	95	89	82	82	83	82	77
1100		540	87	93	88	81	81	81	81	76
1000 900	302.4 220.4	406 296	86 84	94 92	85 83	82 80	80 79	80 78	75 73	70 69
900 800	154.8	296	83	92 91	82	80 79	79 78	78 77	73 72	69 68
000	101.0	200	00	0.					· -	50

Sound Performance Number:

	Perfor	mance Numbe	er: DM9245	Cł	nange Level:	02					
Sales Model:	3511200	1,763.5	2,365	104	99	Rátod	Speed (R	PM)-991	800 100	98	102
Application:	MA 17189E E	PROPUL	1,992	104	98	Pated	Power5(B	KW0.991	763 100	97	101
Application.				103	99	Raggu Detro d	Poweg5(D	1.10.98 1	,705.gg	96	100
Rating Level:	1400	6 (MAXIM, belovisc 829.7	1,113) 102 102	98 97	Rated 96	93 Power	96 SHP	,305 97 97	95 95	99
	1400	664.3	891	102	97 98	96 95	93 91	96 96	97 96	95	98 97
		NICAL Sound				ance 34	1 Meeter			93	96
	1100	402.5	ENGINE 540	100	1 25 ⁹⁶	250 ⁹⁴	500 ⁸⁹	94 1000 ₉₄	2000 ⁹⁵	400092	95
	SPEED	ENGINE 302.4 POWER 220.4	BOWER	OVERAGEL	125 ₉₆ HZ ₉₅	250 ₉₃ HZ ₉₂	500 ₈₉ HZ ₈₈	HZ 93	2000 ₉₅ HZ ₉₄	4000 ₉₁ HZ ₉₁	8000 ₉₅ HZ ₉₄
	RPM800	BKW 154.8	BHP 208	99 DB(A9)8	DB 95	DB 92	DB 88	DB 92	DB 93	DB 90	DB 94
	1800	1.763.5	2.365	104	99	100	98	99	100	98	102
	1700	1,485.6	1,992	104	98	99	97	99	100	97	101
	1600	1,238.6	1.661	103	99	98	95	98	98	96	100
	1500	1.020.5	1.369	102	98	97	94	97	97	95	99
	1400 1300	829.7 664.3	1,113 891	102 101	97 98	96 95	93 91	96 96	97 96	95 93	98 97
	1200	522.5	701	101	97	94	90	95	96	93	96
	1100 1000 800	402.5	540	100 92	96 87	94 88	⁸⁹ 86	94 87	95 88	92 86	95 95 90
	1700	302.4	406 1 992	°° 02	90 86	93 87	89 05	94 07	95 88	91 85	95 an
	900	220.4 1,238.6	296	99 q1	95 87 95 87	92 86	00 83	93 86	⁹⁴ 86	91 84 90 84	94 88 94 87
	8001600 8001500	154.8 1,020.5	208 ⁰⁰¹ 1,369	98 90	86	92 85	⁸⁸ 82	92 85	⁹³ 85	83	87
	1400	829.7	1,113	90	85	84	81	84	85	83	87
	1300 ME2CHAI	664.3 NICAL Soumd	891 Pressure7 Dat	⁸⁹ ta (OB@₽)	86 8 Dista	83 ance82	79 7 Mretei	84 rs (823.	.0 Fe3ent)	81 81	85 84
	1100 ENGINE	ENGINE 402.5 302.4	ENGINE 540	OVERAL	125 84	250 ⁸²	500 77 77	1000 ₈₂	2000 ₈₃	4000 80	8000 ₈₃
	SPEEDO0	POWER 220.4			125 ₈₄ HZ ₈₃	HZ 80	HZ 76	HZ 81	HZ 82	HZ 79	HZ 82
	RPM800	BKW 154.8	BHP 208	87 DB(A8)6	DB 83	DB 80	DB 76	DB 81	DB 81	DB 78	DB 82
	1800	1.763.5	2.365	92	87	88	86	87	88	86	90
	1700	1,485.6	1,992	92	86	87	85	87	88	85	90
	1600	1.238.6	1.661	91	87	86	83	86	86	84	88
	1500	1.020.5	1.369	90	86 85	85	82	85	85 85	83	87 87
	1400 1300	829.7 664.3	1.113 891	90 89	86	84 83	81 79	84 84	85	83 81	85
	1200	522.5	701	89	85	82	78	83	84	81	84
	1100 1000	402.5	540	88 87	84 81	82 82	77 80	82 81	83 83	80 80	83 84
	1700	302.485.6	406 992	⁸⁷ 86	⁸⁴ 81	⁰¹ 81	1 79	82 81	83 82	⁸⁰ 80	83 84
	900 800 ¹⁶⁰⁰	220.4 1.238.6 154.8	296 ⁰⁰² 208	87 85 86 85	83 81 83 81	80 80 80 70	76 77	81 80 81 -	82 80 81 80	79 78 78 78	82 82 82 81
	8001600 1500	1,020.5	1,369	85	80	79	76	79	80	78	81
	1400 1300	829.7 664.3	1,113 891	84 83	80 80	79 77	76 73	79 78	79 79	77 76	81 79
		NICAL Sound				ance7.7	15 Marten		2 Ferest)	75	78
	1100 ENGINE00	402 5	540	OVERAL	125 ⁷⁹ 78	250 ⁷⁶ 75	500 ⁷² 71	1000 ₇₆	2000 ₇₇	4000 74 74	8000 ₇₇
	SPEEDO	POWER 220.4	POWER 296	81	HZ 77	HZ 75	HZ 70	HZ 75	HZ 76	HZ 73	HZ 76
	RPM800	BKW 154.8	BHP 208	DB(A8)0	DB 77	DB 74	DB 70	DB 75	DB 76	DB 72	DB 76
	1800	1,763.5	2,365	87	81	82	80	81	83	80	84
	1700	1.485.6	1.992	86	81	81	79	81	82	80	84
	1600	1.238.6	1.661	85	81	80 70	77 76	80 70	80 80	78 79	82 81
	1500 1400	1,020.5 829.7	1,369 1.113	85 84	80 80	79 79	76 76	79 79	80 79	78 77	81 81
	1300	664.3	891	83	80	77	73	78	79	76	79
	1200	522.5	701	83	79	77	72	77	78	75	78
	1100	402.5	540	82	79	76	72	77	78	74	78
	1000 900	302.4 220.4	406 296	82 81	78 77	75 75	71 70	76 75	77 76	74 73	77 76
	900 800	220.4 154.8	296	80	77	75 74	70 70	75 75	76 76	73 72	76 76
		. 5	200								

Data Date: 3/29/2011

Р	erformance Numbe	er: DM9246	С	hange Level:	02					
Sales Model: 3512	00 1,901.5	2,550	118	123	م الم	Special'	DDM)1101 00	111 OC	111	109
Sales would . 55120		2,148	116	121	_ 117.	Speed (RPM) ¹¹⁰ 1,80 BKW) ¹⁰⁸ 1,90	109	109	107
Application: MA둯	ME PROPULSION	1,791	115	120	Rated	Powergl	BKW);1061,90	11. 1 08	108	105
Rating Level: D-RA			113	118		•	BHP)1052,55		107	104
14		1,200	112	117	112	105	103	105	105	102
13	00 716.3 05520000000000000000000000000000000000	961 Prossuroz Da	110 ta (OBMB)	115 1 Dist :	110	103 1.5 Meete	101 ers (10 4.9	105 Feet)	103 102	101 100
11	~	582	1 07	110	107	100	00	102	100	08
ENGINE	OD ENGINE 326 D	ENGINE 437	OVERAŬ	125 ₁₁₀	250 ₁₀₄	500 ₁₀₀	1000 ₀₀ 2	2000 ₀₂	4000 ₉₅	8000 ₉₀
SPEED	0 POWER 237.7	POWER 319	105	HZ ₁₀₉	HZ ₁₀₃	н z ₉₉		HZ ₁₀₁	н z ₉₄	нz ₈₉
RPM8(BHP 224	DB(A0)3	DB107	DB101	DB 97		DB 99	DB 92	DB 88
180070		2.550 150	118102		119100	111 96			111 91	109 87
1700 1600	1,601.9	2,148	116		117	109			109	107
1500	1,335.5 1.100.4	1,791 1.476	115 113		115 114	108 106			108 107	105 104
1400	894.7	1,200	112		112	105			105	102
1300	716.3	961	110	115	110	103			103	101
1200	563.4	756	109	114	109	102	100 1	03	102	100
1100	434.0	582	107	112	107	100			100	98
1000 90018	00 326.0 221,901.5	437	106 105	110 100 113	104	100 98	u/	02 97	⁹⁵ 97	⁹⁰ 95
17		319 224 224 701	105 105 105 103 103	109 111	103 105	99 97 97 97	90 Q5 1	01 96 99 96	94 96 92 96	⁸⁹ 93
800 ¹⁶ 700 ¹⁶	$\begin{array}{cccc} 00 & & 1601.9 \\ 166.935.5 \\ 00 & & 111.800 \\ \end{array}$	150,791	103 103 103 101 102 100	109 107 107 109 106 107	104 103 105 101 103 100 101	06 ⁹⁴	05 93 (ng 94	01 95	88 90 87 90
700 ₁₅	00 '1,100.4	1,470	100			92	92	93	93	89
14 13		1,200 961	98 97	106 103	100 98	91 91	90 90	91 91	92 91	87 86
	dEXHAUST Southerd				ance ₂₆	7 Meete			89	84
		592	· · ·	100	OF	00	` 00	°°,	00	02
	00 ENGINE 434.0 326.0	ENGINE 437	overgel	125 ₁₀₀	250 ₉₁	500 ₈₈	1000 ₈₇ 2	2000 ₈₆	4000 ₈₁	8000 ₇₇
SPEED		POWER 319	91	HZ 99	HZ 90	HZ 87		HZ 85	HZ 80	HZ 76
RPM8(BHP 224	DB(A9)0	DB 98	DB 89	DB 86		DB 84	DB 79	DB 75
180070		2,550 150	105 89		107 88	98 85 07		97 83 96	97 78 06	95 74
1700 1600	1.601.9 1,335.5	2.148 1.791	103 101	111 109	105 103	97 94		96 94	96 95	93 90
1500	1.100.4	1.476	100	103	100	92		93	93	89
1400	894.7	1,200	98	106	100	91		91	92	87
1300	716.3	961	97	103	98	91	90 9	91	91	86
1200	563.4	756	95	102	96	89		90	89	84
1100	434.0	582	94	100	95	88		88	88	83
1000 900,-	326.0 237.901.5	437 319	92 91 98	100 99 106	91 90 100	88 87 92		86 85 91	81 80 91	77 76 88
80017	00 166 01.9	22,148	90 96	98 104	89 ⁹⁹	ac 90	85 88 g	₈₄ 89	70 89	75 80
70016 700	00 1,335.5	150 ⁷⁹¹	89 95	97 ¹⁰²	88 90	85 87	83 8/ 8	₂₃ 88	78 88	74 04
15	00 1,100.4 00 894.7	1,476 1,200	93 92	99 ³⁷ 101	95 93	86 84	85 84	86 85	/ 87 85	82
14		961	92 90	99 97	93 91	04 84	84 84	85	84	81 79
	EXHAUST Sound				ancei	15 Meete			83	78
	00 404.0	ENGINE 582 437		125 94 94	250 ⁸⁸ 85	500 ⁸¹ 82	` 04		4000 75	76 8000 ₇₁
SPEED	00 POWER 237.7	POWER 319	85	HZ 93	HZ 85	HZ 81	HZ 79	HZ 79	HZ 74	HZ 69
RPM8(0 BKW 166.9		DB(A8)3	DB 91	DB 82	DB 79	DB 78	DB 77	DB 72	DB 68
180070		2.550 150	98 82	106 90	100 81	92 78	90 77 9	91 76	91 71	88 67
1700	1.601.9	2,148	96	104	99	90		89	89	86
1600	1.335.5	1.791	95	102	96	87		88	88	84
1500	1,100.4	1.476	93	101	95	86		B6	87	82
1400	894.7	1.200	92	99	93	84		85	85	81
1300 1200	716.3 563.4	961 756	90 89	97 95	91 90	84 83		85 83	84 83	79 78
1200	563.4 434.0	756 582	89 87	95 94	90 88	83 81		83 82	83 81	78 76
1000	326.0	437	86	94	85	82		32 80	75	70
900	237.7	319	85	93	84	81		79	74	69
800	166.9	224	83	91	82	79		77	72	68
									· -	
700	111.8	150	82	90	81	78		76	71	67

Data Date:

3/29/2011

Sound Performance Number:

	Perfor	mance Numbe	er: DM9246	Cł	nange Level:	02					
Sales Model:	351/2600	1,901.5	2,550	104	99	Rated	l Speexal (I	RPM) 99 1	,800 100	98	102
Application:	MARTINGEP	ROPULS	2,148	104	98	Rated	Power (E	3 KW) .99 1	,901. ⁵⁰⁰	97	101
Rating Level:	D-RAIING	(INTER 1335-5E		103	99 98	Rate of	Power (E d Power (I	BHP): 98	.550 ⁹⁸	96 95	100
J	1400	894.7	1,476	102 102	98 97	97	94 (9 7 96	97 97	95 95	99 98
		NICAL Sound				ance ⁹⁵	1 Mgete	06		93 93	97 96
	ENGIŃÉ ⁰⁰	ENCINE 434.0	ENGINE 582	OVERAL	12596	25094	50089	100094	2000 ⁹⁵	400092	8000 ⁹⁵
	1000	POWER 326.0	POWER 437	99	HZ ⁹⁶	u y 93	HZ ⁸⁹		u y 95	н г ⁹¹	HZ 95
	900 RPM	BKW 166 9	BHP 319	099 DB(A)	DB 95 08 95	DB 92	DB 88 88	HZ 93 DB 93	DB 94	DB 91	DB 94 08 94
	1800 ₇₀₀	1.901.511.8	2.550150	104 97	99 94	100 91	98 87	99 92	100 93	98 90	102 93
	1700	1,601.9	2,148	104	98	99 08	97 05	99	100	97 06	101
	1600 1500	1.335.5 1,100.4	1.791 1,476	103 102	99 98	98 97	95 94	98 97	98 97	96 95	100 99
	1400	894.7	1.200	102	97	96	93	96	97	95	98
	1300	716.3	961	101	98	95	91	96	96	93	97
	1200	563.4	756	101	97	94	90	95	96	93	96
	1100	434.0	582	100	96	94	89	94	95	92	95
	1000 900 ¹ 800	326.0 2317,9701.5	437 312∂550	99 99 92	96 95 87	93 92 88	89 88 86	94 93 87	95 94 88	91 91 86	95 94 90
	8001700	166,901.9	2224,148	99 92 98 92	95 86	92 87 92 87	88 85	93 07 92 87	94 00 93 88	90 85	94 90 94 90
	7001600	114,3835.5	150791	97 91	94 87	91 86	87 83	92 86	93 86	90 84	93 88
	1500	1,100.4	1,476	90	86	85	82	85	85	83	87
	1400	894.7	1,200	90	85	84	81	84	85	83	87
		NICAL Sound			ĝist	ance ⁸³	7 Meste			81 81	85 84
		ENGINE 434.0	ENGINE 582	OVERÅL	125 ⁸⁴	250 ⁸²	500 77	1000 ⁸²	2000 ⁸³	4000 ⁸⁰	8000 ⁸³
	SPEED	POWER 326.0 237.7	POWER 437 319	87 87	HZ 84	HZ 81	HZ //	HZ		HZ_{70}^{80}	
	RPM 800	BKW 166 9	BHP 224	087 DB(A)	DB 83 83	DB 80	DB 76	DB 81 81	DB 82 81	HZ ⁸⁰ DB 79	DB 82
	1800700	1.901. []1.8	2.550150	92 85	87 82	88 79	86 75	87 80	88 81	86 78	90 81
	1700	1.601.9	2.148	92	86	87	85	87	88	85	90
	1600	1.335.5	1.791	91	87	86	83	86	86	84	88
	1500 1400	1.100.4 894.7	1.476 1,200	90 90	86 85	85 84	82 81	85 84	85 85	83 83	87 87
	1300	716.3	961	89	86	83	79	84	85	81	85
	1200	563.4	756	89	85	82	78	83	84	81	84
	1100	434.0	582	88	84	82	77	82	83	80	83
	1000	326.0	437	87	84	81	77	82	83	80	83
	9001800	2317,9701.5	3129550	87 87 86 86	83 81	80 82 80 81	76 80	81 81 81 81	82 83 81 82	79 80 78 80	82 84
	800 ¹ 700 7001600	1666901.9 1111,3835.5	<u>22</u> 4148 150791	85 85	83 81 82 81	79 80	76 79 75 77	80 80	81 82 81 80	78 00 78 78	82 84 81 82
	1500	1,100.4	1,476	85	80	79	76	79	80	78	81
	1400	894.7	1,200	84	80	79	76	79	79	77	81
	MECHAN	NICAL Sound	Pressure Bat	ta (OBǧ)		ance;77	15 Mezte	rs (⁷⁸ ₇ 49	.2 Feyet)	76 75	79 78
	ENGINÊ ⁰⁰	ENGINE 434.0	ENGINE 582	OVERÅEL	125 ⁷⁹	250 ⁷⁶	500 ⁷²	1000 ⁷⁷	2000 ⁷⁸	4000 ⁷⁴	8000 78
	SPEED	POWER 326.0	POWER 437	82	HZ ^{/ O}	H7 ^{/5}	HZ ⁷¹	HZ ^{/6}	нz ⁷⁷	HZ_{72}^{74}	HZ 77
	SPEED 900 RPM800	BKW 166 0	BHP 224	DB(A)	DB 77	DB 75	DB 70	DB 75	DB 76	DB 73	DB 76
	1800700	1,901,511,8	2.550150	87 80	81 76	82 73	80 69	81 74	83 75	80 72	84 75
	1700	1.601.9	2.148	86	81	81	79	81	82	80	84
	1600	1,335.5	1,791	85	81	80	77	80	80	78	82
	1500	1.100.4	1.476	85 84	80 80	79 70	76 76	79 70	80 70	78 77	81 81
	1400 1300	894.7 716.3	1.200 961	84 83	80 80	79 77	76 73	79 78	79 79	77 76	81 79
	1200	563.4	756	83	79	77	72	77	78	75	78
	1100	434.0	582	82	79	76	72	77	78	74	78
	1000	326.0	437	82	78	75	71	76	77	74	77
	900	237.7	319	81	77	75	70	75	76	73	76
	800 700	166.9	224	80	77	74 70	70	75	76	72	76
		111.8	150	80	76	73	69	74	75	72	75

Data Date: 3/29/2011

Sound Performance Number:

	Perfor	mance Numbe	r: DM9253	С	hange Level:	03					
Sales Model:	351200	1,350.0	1,810	115	120	Ration	Snode 8	DM\1061 6	300 108	108	105
			1,492	113	118	114 Deted	106 106	RPM) ¹⁰⁶ 1,6	106	107	104
Application:			1,213	112	117			KW): 1031,3		105	102
Rating Level:					115			3HP)1011,8		103	101
	1200 1100	569.5	764	109	114	109 107	102 100	100 99	103	102	100
		438.7 AUST Soumd	588 Prossuro4Dat	107 ta (OBME)	112 1 Mist		1.5 Mete		102 Feet)	100 95	98 90
	900	240.3	300	105	109	103	99	` 98	101	94	89
E	ENGINE00 SPEEP00	ENGINE 168.8	ENGINE 226 POWER 152	ОVERҢॅ Ğ 102	125 ₁₀₇ HZ ₁₀₆	250 ₁₀₁ HZ ₁₀₀	500 ₉₇ HZ ₉₆	1000 ₉₆ HZ ₉₅	2000 ₉₉ HZ 98	4000 ₉₂ HZ 91	8000 ₈₈ HZ ₈₇
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1.350.0	1.810	115	120	115	108	106	108	108	105
	1500	1,112.4	1,492	113	118	114	106	105	106	107	104
	1400	904.4	1,213	112	117	112	105	103	105	105	102
	1300	724.1	971	110	115	110	103	101	105	103	101
	1200	569.5	764	109	114	109	102	100	103	102	100
	1100	438.7	588	107	112	107	100	99	102	100	98
	1000	329.6	442 221,810	¹⁰⁶ 101	¹¹⁰ 109	¹⁰⁴ 103	¹⁰⁰ 94	⁹⁹ 93	102 95	⁹⁵ 95	⁹⁰ 90
		240.24	³² f 192				99 92	98 92	101 93	94 94	⁸⁹ 89
					107 107 106		97 91 96 01	96 90	99 91	92 92 01 92	88 87 87
	⁷⁰⁰ 1300	724.1	152 ⁹⁷¹	102 98 97	103	98	91	95 90	98 91	⁹¹ 91	87 86
	1200	569.5	764	95	102	96	89	89	90	89	84
	1100	438.7	588	94	100	95	88	88	_ 88	88	83
		AUST Sound		· · ·		ance ²²	7 Meete) Feet)	82	77
F	900 ENGINE	240.3 ENGINE 168.8	ENGINE 226	91 OVERASH	99 125 ₉₈	90 250 ₈₉	87 500 86	86 1000 ₈₅	85 2000 ₈₄	80 4000 ₇₉	76 8000 ₇₅
	SPEED		POWER 152	89	HZ 97	HZ 88	HZ 85	HZ 84	HZ 83	HZ 78	HZ 74
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1,350.0	1,810	101	109	103	94	93	95	95	90
	1500	1.112.4	1.492	100	107	101	92	92	93	94	89
	1400	904.4	1,213	98	106	100	91	90	91	92	87
	1300 1200	724.1 569.5	971 764	97 95	103 102	98 96	91 89	90 89	91 90	91 89	86 84
	1200	438.7	764 588	95 94	102	96 95	69 88	69 88	90 88	69 88	83
	1000	430.7	142	02	100	00	00	07	07	00	77
	1000	329.6 240.3 165, 12.4	442,810 322,402	01 95	¹⁰¹ 102 99 101	00 90	o7 0/	°C 01	85 ⁰⁰	on 09	76 04
	900 ₁₅₀₀ 800 ₁₄₀₀	168.804.4	<u>5</u> ,492	oo 93	00 101	95	00 00	05 00	00 10	70 0/	75 02
	700 ₁₃₀₀	113.0 724.1	²²⁰ ,213 152 [°] 971	on 92	07 99	°° as	of 04	04 04	°2 02	70 00	74 01
	1300	724.1	971	90	97	⁰⁰ 91 90	04	04	60	04	79
	1200 1100	569.5 438.7	764 588	89 87	95 94	90 88	83 81	82 81	83 82	83 81	78 76
		AUST Sound				ance ⁸⁵	15 Meete		? Fe3et)	75	70
	900	240 3	322	` 85	93	84	81	` 70	79	74	70
		ENGINE 168.8	ENGINE 226 POWER 152	OVERAJL 82	125 ₉₁ HZ 90	250 ₈₂ HZ 81	500 ₇₉ HZ 78	1000 ₇₈ HZ 77	2000 ₇₇ HZ 76	4000 ₇₂ HZ 71	8000 ₆₈ HZ 67
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1,350.0	1,810	95	102	96	87	87	88	89	84
	1500	1.112.4	1.492	93	101	95	86	85	86	87	82
	1400	904.4	1,213	92	99	93	84	84	85	85	81
	1300	724.1	971	90	97	91	84	84	85	84	79
	1200	569.5	764	89	95	90	83	82	83	83	78
	1100	438.7	588	87	94	88	81	81	82	81	76
	1000	329.6	442	86	94	85	82	80	80	75	71
	900	040.0	000	05	93	84	81	79	79	74	70
		240.3	322	85							
	800 800 700	240.3 168.8 113.0	322 226 152	85 83 82	93 91 90	82 81	79 78	79 78 77	79 77 76	74 72 71	68 67

Sound Performance Number: DMa

	Performance	e Number: DM	9253	Change Leve	el: 03					
Sales Model: 3	5 110600	1,350.0	1,810 1	03 99	Pakad	Snool (PP	M\98 1 6	nn 98	96	100
Application: N				02 98		Speed (RP 94 Powes (BK	97 1 2	50 8 ⁷	95	99
Application: IV	ARE PROPU		1,213 1	02 97					95	98
Rating Level: A						Power (BH	,		93	97
	1200	569.5		01 97	94	90	95	96	93 92	96
		438.7 Societation States 438.7		00 96 Mari da	94 istanc e 3	89 1 Meters	94 (94 3 3	95 Feest)	92 91	95 95
			322	0 05	02	00	` 03	04	01	94
EN	GINE ENGI	NE 240.3 168.8 ENGINE	226 OVER	μL 125 ₉₅	250 ₉₂	500 ₈₈ 1	000 ₉₂	2000 ₉₃	4000 ₉₀	8000 ₉₄
		ER 113.0 POWER	102	HZ_{94}	HZ ₉₁		HZ 92	HZ 93	нz ₉₀	HZ 93
R	PM BK	N BHP	DB(A		DB		DB	DB	DB	DB
		350.0 1.8		99	98		98	98	96	100
		112.4 1.4		98	97		97	97	95	99
		904.4 1,2 724.1 9	13 102 71 101	97 98	96 95		96 96	97 96	95 93	98 97
			64 101	98 97	95 94		90 95	96 96	93	97 96
1	100		88 100	96	94		94	95	92	95
1	000			06	⁹³ 86	80 0	04	05	91 84	05
ç	000	240,350.0		90 95 87 90 95 86	92 05		93 86 93 85	95 86 94 85	91 ⁸⁴ 83	94 94 87
	300, 100	16883 - 2 9044	46_{213} 98 c	95 85	92 84	00 81 S	92 ₈₄	93 85	90 83	94 87
7	7001400 1300	¹¹³ ⁰ 724.1 1	52 07	⁹⁴ 86	91 83	87 79	92 84	93 85	⁹⁰ 81	93 85
	1200	569.5	764 8	9 85	82	78	83	84	81	84
	1100	438.7		88 84	82	77	82	83	80	83
	MECHANICAL		•		istance:	7 Mēters	(823.0		80	83
EN	900 GINEO ENGI	NE 240.3 168.8 ENGINE	322 226 OVER	⁸⁷ L 125 83	250 80	500 ₇₆ 1	81 000 ₈₁	2000 ₈₁	79 4000 ₇₈	8000 ₈₂
	PEEP00 POW	ER 113.0 POWER		HZ_{82}			HZ 80	HZ 81	HZ 78	HZ 81
R	PM BK\		DB(A		DB		DB	DB	DB	DB
		350.0 1.8		87	86		86	86	84	88
		112.4 1.4		86	85		85	85	83	87
		904.4 1,2 724.1 9	13 90 71 89	85 86	84 83		84 84	85 85	83 81	87 85
			64 89	85	82		54 83	84	81	83 84
1	100	438 7 5	88 88	84	82		B2	83	80	83
1	000 000 000	329.6 4 329.6 4 240.3 - 3	40 87	85 84 85 81	81 80	77	82 80	⁸³ 80	⁸⁰ 70 78	83
			22 1492 87 8	83 80 83 80	80 70		B1 70	82 80	⁷⁹ 79	82 82 81
8	300	1112.4 1688 2 11304.4	26_{213} 86	14 ⁸³ 80	⁸⁰ 79	⁷⁶ 76	⁸¹ 70	⁸¹ 79	^{/8} 77	82 81
7	700 1300	113 <u>0</u> 724.1		⁸² 80	79 77	75 73	⁸⁰ 78	⁸¹ 79	⁷⁸ 76	⁸¹ 79
	1200	569.5	764 8	3 79	77	72	77	78	75	78
	1100	438.7		2 79	76	72	,77	_ 78	74	78
	MECHANICAL	040.0			istance ⁵	15 Meters	(7 649.2	70	74	77
	900 GINEO ENGI PEEDO POW	NE 240.3 168.8 ENGINE ER 113.0 POWER	322 226 OVER		75 250 ₇₄ HZ ₇₃	500 ₇₀ 1 HZ ₆₉	75 000 ₇₅ HZ ₇₄	76 2000 ₇₆ HZ ₇₅	73 4000 ₇₂ HZ ₇₂	76 8000 ₇₆ HZ 75
	22 <i>4</i> 00 POW		152 8 DB(A		DB		DB	DB	DB	DB
		350.0 1,8		81	80		BD 80	80	78	82
		112.4 1.4		80	79		79	80	78	81
		904.4 1.2		80	79		79	79	77	81
1:	300	724.1 9	71 83	80	77		78	79	76	79
			64 83	79	77		77	78	75	78
			88 82	79	76		77	78	74	78
			42 82 22 81	78 77	75 75		76 75	77 76	74 73	77 76
			22 81 26 80	77	75 74		75 75	76	73	76 76
			52 80	76	73		74	75	72	75

	Perform	nance Numbe	er: DM9254	Ch	ange Level:	03					
Sales Model:	3511000	1,425.0	1,911	115	120	Rated	Sneder	RPM) ¹⁰⁷ 1	600108	109	106
Application:			1,575	114	119	114 Deted	107	RPM) ¹⁰⁷ 1, BKW) <mark>1</mark> 051,	425 07	107	104
			1,280	112	117					106	103
Rating Level:		`	, ,	110	115			BHP)1021,		103	101
	1200 1100	601.2 463.1	806 621	109 107	114 112	109 107	102 100	100 99	103 102	102 100	100 98
		AUST Spatingd				ance04	1.5 Moete			95	90 91
	900	252.6	340	105	109	103	00	1000 ₉₇	101	0/	00
		ENGINE 178.1	ENGINE 239 POWER 160	OVERAJ	125 ₁₀₈	250 102	500 ₉₈	1000 ₉₇	2000 ₀₀	4000 ₉₃	8000 ⁸⁸
	SPEEP00 RPM	POWER 119.3 BKW	BHP	103 DB(A)	нz ₁₀₇ DВ	HZ ₁₀₁ DB	HZ 97 DB	HZ 96 DB	HZ 99 DB	HZ 92 DB	HZ 87 DB
	1600	1.425.0	1.911	115	120	116	108	107	108	109	106
	1500	1,174.2	1,575	114	119	114	107	105	107	107	104
	1400	954.6	1,280	112	117	113	105	104	105	106	103
	1300	764.3	1.025	110	115	110	103	102	105	103	101
	1200	601.2	806	109	114	109	102	100	103	102	100
	1100	463.1	621	107	112	107	100	99	102	100	98
	1000 9001600 9001500	347.9 25,425.0	467 1911 340575	¹⁰⁶ 102	110 100 ¹⁰⁹	¹⁰⁴ 103103	100 99 94	99 98 94	102 101 95	95 94 96	91 89 91
	8001500	253.6 253.6 174.2 1789 17954.6	2202/2	104 100	109108	103 103 102 102	08 93	07 92	100 93	03 94	88 89
	7001400 7001300	119-3	160-00	103 99 103 97	109 109108 108106 107106 104	101100	07 91	oe 91	oo 92	02 92	87 88
	1300	601.2	1,025 806	97	104	98 97	97 91 90	90 91 89	99 92 90	⁹² 91 90	67 86 85
	1200	463.1	621	96 94	102	97 95	90 88	88	90 89	90 88	83
		AUST Sourned		• •		ance ²	7 Mete			82	78
	900	252.6	340	` 01´	00	00	07		05 1	80	76
	ENGINE	ENGINE 178.1	ENGINE 239	OVERĂ	125 ₉₈	250 89	500 86	1000 ₈₅	2000 ₈₄	4000 79	8000 ₇₅
	SPEEP00 RPM	POWER 119.3	POWER 160 BHP	89 DB(A)	HZ 97	HZ 88 DB	HZ 85	HZ 84	HZ 83	HZ 78	HZ 74 DB
		BKW		102	DB 109	103	DB 94	DB 94	DB 95	DB 96	91
	1600 1500	1,425.0 1.174.2	1,911 1.575	102	109	103	94 93	94 92	95 93	96 94	91 89
	1400	954.6	1,280	99	106	100	91	91	92	92	88
	1300	764.3	1.025	97	104	98	91	91	92	91	86
	1200	601.2	806	96	102	97	90	89	90	90	85
	1100	463.1	621	94	101	95	88	88	89	88	83
	1000 900	347.9	467 1911 340	⁹³ 95	¹⁰¹ 00 103	92 97	⁸⁹ 88	⁸⁷ 87	87 88	82 89	78 84
	900 1500 800	253.6 171,174.2	340 239 239 1-280	91 94	³³ 101	90 95	87 86 86	86 86 86	85 87 84 87	80 70 87	76 83
		253,674.2 174.2 178954.6 119,3	160	90 92 89 92	98 101 97 100	89 94 88 94	86 85 85 85	85 84 84 84	₂₃ 85	79 86 78 86	75 81 74 70
	1300	764.3	1,025	90	97	91	84	84	85	84	79
	1200 1100	601.2 463.1	806 621	89 87	95 94	90 88	83 81	83 81	83 82	83 81	78 76
		AUST Southed				ances5	15 Mete		2 Feet)	75	70
	900	253.6	340	` <u>85</u> ´	03	0.4	500 ⁸¹	, ⁷⁹	, ⁷⁹	74	70
		ENGINE 178.1 POWER 119.3	ENGINE 239 POWER 160	OVERĂĽL 83	125 ₉₂ HZ ₉₁	250 ₈₃ HZ ₈₂	500 ₈₀ HZ ₇₉	1000 ₇₈ HZ ₇₇	2000 ₇₈ HZ 77	4000 ₇₃ HZ ₇₂	8000 ₆₉ HZ ₆₇
	RPM	BKW	BHP	DB(A)	DB	DB	DB	DB	DB	DB	DB
	1600	1,425.0	1,911	95	103	97	88	87	88	89	84
	1500	1.174.2	1.575	94	101	95	86	86	87	87	83
	1400	954.6	1,280	92	100	94	85	84	85	86	81
	1300	764.3	1.025	90	97	91	84	84	85	84	79
	1200	601.2	806	89	95	90	83	83	83	83	78 76
	1100 1000	463.1 347.9	621 467	87 86	94 94	88 85	81 82	81 81	82 80	81 75	76 71
	900	253.6	340	85	94 93	83 84	82 81	79	79	73	70
			0.0	~~		. .	~ .				
	800	178.1	239	84	92	83	80	78	78	73	69

Sound Performance Number:

	Performan	ce Number:	DM9254	Chan	ge Level:	03					
Sales Model: 3	5128000	1,425.0	1,911	103	99	Rated	Speed (RI	PM): 98 1.	600 98	96	100
Application: N		0111 ¹ 5174M	1,575	102	98	Pafod I	Power ⁹⁴ 93	MAN.97 1	125 87	95	99
	1400	454 h	1,280	102	97			.96	⁴ 23.0	95	98
Rating Level: E		AVY76443IY)	,	101	98		Power (B		911 ₉₆	93	97
	1200	601.2	806	101	97	94	90	95	96	93	96
	MEGHANICA	463.1	621	2(OPCE)	96 Dict	94 ancej ₃	1 Meters	· (⁹⁴ 22	5	92	95
		L Southing P			gaist					91	95
EN		GINE $\frac{253.6}{178.1}$ E	NGINE 340	OVERAL	125 ⁹⁵ 95	250 ⁹²	500 ⁸⁸	1000 ⁹³	2000 94	4000 ⁹¹	8000 ⁹⁴
SI	PEED 00 PO	WER 178.1 P	OWER 239 160	98 97	HZ 95 94	HZ 92 91	HZ 88 HZ 87	HZ 92 92	HZ 93	HZ 90	HZ 94 93
F	RPM B	KW	BHP	DB(Å)	DB ⁹⁴	DB	DB°'	DB	DB	DB	DB
1	600	1.425.0	1.911	103	99	98	95	98	98	96	100
		1,174.2	1,575	102	98	97	94	97	97	95	99
1	400	954.6	1,280	102	97	96	93	96	97	95	98
1	300	764.3	1.025	101	98	95	91	96	96	93	97
1	200	601.2	806	101	97	94	90	95	96	93	96
	100	463.1	621	100	96	94	89	94	95	92	95
1	000	347.9	467	99	96 .7	93	89	94	95	91 01 84	95
	900 ¹⁶⁰⁰	253.625.0	340911	99 91	95 87 95 86	92 86	88 83 88 82	93 86 92 85	94 86 93 85	31 00	94 88 94 87
	300 ¹ 500 700 ¹⁴⁰⁰	178.174.2 119.3 ^{54.6}	239575 160280	98 90 97 90	00	92 85 91 ⁸⁴	00 01	52	00	00 00	⁰⁴ a=
	1300	119.30-4.0 764.3	160200	97 90 89	94 ⁸⁵ 86	91 0 1 83	87 ⁸¹ 79	92 ⁸⁴ 84	93 85 85	90 83 81	93 87 85
	1200	601.2	806	89	85	82	78	83	84	81	84
	1100				84	82	77			80	83
	MEGHANICA	L Sound P	ressure ₄ Dat	a (OBĢ F)	₈ Dista	ance ₈₁	7 Mjęters	82 8 (8 <u>2</u> 3.0) Feest)	80	83
EN		GINE 253.6 178 1	NGINE 340		125 ⁸³ 83	250 ⁸⁰	500 ⁷⁶	1000 ⁸¹	200082	4000 ⁷⁹ 78	8000 ⁸²
51		WER 178.1 P	OWED 239	86	HZ 83 HZ 82	HZ 79	н л 76	HZ 81 80	HZ 81 HZ 81	HZ 78	HZ 82 81
JI F	сс 7 00 RPM В	KW 119.3	BHP 160	85 DB(A)	DB 82	DB	HZ 76 DB	DB 80	DB 81	DB 78	DB 81
		1,425.0	1,911	91	87	86	83	86	86	84	88
		1.174.2	1.575	90	86	85	82	85	85	83	87
	400	954.6	1,280	90	85	84	81	84	85	83	87
	300	764.3	1.025	89	86	83	79	84	85	81	85
	200	601.2	806	89	85	82	78	83	84	81	84
1	100	463.1	621	88	84	82	77	82	83	80	83
1	000	347.9	467	87	84	81	77	82	83	80	83
!	9001600	253.625.0	340911	87 85	83 81	80 80	76 77	81 80	82 80	79 78	82 82
:	300 ¹⁵⁰⁰	178.174.2	239575	86 85	83 80	80 79	76 76	81 79	81 ⁸⁰	78 78	82 81
	700 ¹⁴⁰⁰ 1300	119.954.6 764.3	160 ²⁸⁰ 1,025	85 84 83	82 ⁸⁰ 80	79 79 79 77	75 76 73	80 79 78	81 ⁷⁹ 79	78 77 76	81 81 79
	1200	601.2	806	83	79	77	73	78	79 78	70	79
	1100				79	76	72	77	78	74	78
	MEGHANICA	L Sound P	ressure ₄ Dat	a (OBĞḖ́F)	-Qista	ance _{%5}	15 Meters	s (₇ 4 9.:	2 Fexent)	74	77
EN	GINE ⁰⁰⁰ ENO PEED00 PO	GINE $\frac{253.6}{178.1}$ E	NGINE 340		125 ⁷⁷	250 ⁷⁵	500 ⁷⁰ ₇₀	1000 ⁷⁵	2000 ⁷⁶	4000 ⁷³ 72	8000 ⁷⁶
SI	PEED PO	WER 178.1 P	OWED 239		HZ 77 HZ 76	HZ 74 HZ 73	ыо ₇₀ нz ₆₉	117 / 3	2000 HZ 76 75	HZ 72 HZ 72	HZ 76 HZ 75
	СС <u>700</u> В	KW 119.3	BHP 160	80 DB(A)	DB 76	DB 73	DB 69	π 2 74 DB	DB 75	DB 72	DB 75
		1,425.0	1,911	85	81	80	77	80	80	78	82
		1,425.0	1.911	85 85	81	80 79	77 76	80 79	80 80	78 78	82 81
	400	954.6	1,280	84	80	79 79	76	79 79	80 79	78	81
	300	764.3	1.025	83	80	75	73	78	79 79	76	79
	200	601.2	806	83	79	77	72	77	78	75	78
	100	463.1	621	82	79	76	72	77	78	74	78
	000	347.9	467	82	78	75	71	76	77	74	77
	900	253.6	340	81	77	75	70	75	76	73	76
:	300	178.1	239	80	77	74	70	75	76	72	76
	700	110.0	160	80	70	73	69	74	75	70	75
	700	119.3	160	60	76	13	69	74	15	72	75

Application: MA1599E PROPUL38890 1.657 114 119 Ratifi Powel 2 BKW, 106, 500 P07 108 100 Rating Level: C-FA31NG (MAXIMLM CONTINU 4745) 111 116 Ratifi Powel 2 BKW, 106, 100 P05 106 100 100 XHAUST Sound Pressure Data (DBCR) 111 116 Ratifi Powel 2 BKW, 106, 100 P05 102 101 102 101 ENGINE 00 ENGINE 267.0 ENGINE 257.0 ENGINE 256 DUPWER 187.5 DUPWER 187.5 ENGINE 256 DUPWER 187.5 DUPWER 187.5 <t< th=""><th></th><th>Perfo</th><th>ormance Numbe</th><th>er: DM9255</th><th>с</th><th>hange Level:</th><th>01</th><th></th><th></th><th></th><th></th><th></th></t<>		Perfo	ormance Numbe	er: DM9255	с	hange Level:	01					
Application: MARTINE PROPUL 1999 1.877 114 119 Rating Level: C.P.RATING (MAXIM/MCONTINL 994S) 111 116 116 111 106 1002 1001 104 102 1001 104 102 100 111 116 116 116 116 116 116 116 116 116 116 116 117 113 106 106 107 108 106 1500 1.236.0 1.637 114 119 116 111 104 102 101 104 102 100 106 103 106 103 103	Sales Model:	3512600	1.500.0	2.012	116	121	Ratied	Speed9(I	RPM)1 071.	600 109	109	106
Rating Level: C-R330 NG (MAXIMUM CONTINUE) 111 111 Ratid Power (BHP) 102 101 103 102 101 103 102 101 103 102 101 103 102 101 103 102 101 103 102 101 103 102 101 103 102 101 103 102 101 103 102 101 103 102 101 103 102 101 103 102 101 103 102 101 103 102 100 103 102 100 103 102 100			,									105
1100 632.8 849 109 114 109 102 101 104 102 101 104 102 101 104 102 101 104 102 101 104 102 101 104 102 101 104 102 101 104 102 101 104 102 101 104 102 101 104 102 101 104 102 101 104 102 101 104 102 101 104 102 101 102 101 102 101 102 101 102 101 102 101 102 101 102 101 102 101 102 101<	Deting Level				112		113 Dotoo	105	,104 ['] ,	012		103
11002 HAULST 5487.47 Pressurs.pbata (OBCR) 1133 10102 1011 99.4 97.69 1022 1013 1011 99.4 97.69 1022 1023 1011 99.4 97.69 102 1011 103 103 103 103 103 103 103 103 103 103 103 103 103 103 103 103 103 103 104 102 101 104 102 101 104 102 101 104	Rating Level:											102
ENGINE SPEED00 ENGINE POWER 125.6 POWER 125.6<												
ENGINE SPEED00 ENGINE POWER 125.6 POWER 125.6<		1005	HAUST Sowind	Pressure	a (OBÇĔ)	1Dist	ance ₀₄	1.5 Mete	ers (994.9) Feet)		99 91
SPEEDO: RPM POWER 1:63 BH/ 1:03 BH/ 1:12 BH/ 1:13 BH/ 1:14 BH/ 1:16 BH/ 1:14 BH/ 1:14 BH/ 1:14 BH/ 1:14 BH/ 1:14 BH/ 1:16 BH/ 1:14 BH/ 1:16 BH/ 1:14 BH/ 1:16 BH/ 1:14 BH/ 1:16 BH/ 1:16 BH/ 1:14 BH/ 1:16 BH/		5000	ENGINE 267.0	358		109	aco ¹⁰³	500,99	400098	200101		8000 ⁹⁰
HYM BKW BHP DB(A) DB <		SPEED ⁰⁰	POWER 187.5	POWER 251		ит ¹²⁵	H7 ¹⁰²	ыл ⁹⁸	н 7 97	2000 н 7 ¹⁰⁰	4000 H7 ⁹³	ыл 88
1600 1.500.0 2.012 114 121 116 109 107 106 107 104 102 105 104 102 104 102 104 102 104 102 104 102 104 102 104 100 26 95 96 91 90 102 101 103 104 100 92 93 101 94 94 94 94 94 94 94 94 94 94 94 94 96 96 91 90 90 90 90 90 <td></td> <td>PPM</td> <td>BKW 125.6</td> <td>168</td> <td></td> <td>107 DB</td> <td>101 DB</td> <td>07 DB</td> <td>DB 96</td> <td>DB 99</td> <td>92 DB</td> <td>08 BR</td>		PPM	BKW 125.6	168		107 DB	101 DB	07 DB	DB 96	DB 99	92 DB	08 BR
1500 1.236.0 1.657 114 119 115 107 106 107 108 105 1400 1.0049 1.348 112 117 113 106 107 106 107 108 105 1200 632.8 844 109 114 116 111 104 102 100 104 102 100 1000 366.2 .491 106 110 104 100 99 50.2 91 102 94 94 99 90 92 93 100 44 93 90 90 90 92 93 102 92 93 87 87 90 <td< td=""><td></td><td></td><td></td><td></td><td>()</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>					()							
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1300 804.6 1.079 111 116 111 104 102 106 104 102 100 1100 487.4 654 108 113 108 101 99 102 101 99 102 95 98 94 101 99 102 95 91 102 92 93 93 93 93 93 93 109 400 102 94 83 89 100 94 88 83 89 89 100 92 93 93 93 93 93 109 400 94 88 83 88 88 88 88 88 88 88 88 88 88 88 88 88 88 88 88 88 89 100<												
1100 487.4 654 108 113 108 101 99 102 101 95 91 1000 366.2 491 106 100 104 99 50 95 91 95 91 95 91 95 91 96 91 92 95 91 96 91 92 95 91 90 92 92 93 97 93 97 93 91 90 92 91 87 88 88 87 88 88 87 88 88 88 96 102 97 90					111	116	111	104	102	105	104	102
1000 366.2 491 106 110 1104 100 99 99 102 95 91 900 000 25% 657 104 101 103 104 99 93 97 93 100 94 39 94 80 96 102 98 93 97 93 100 94 39 84 87 88 1300 804.6 165,348 103 99 107 101 101 97 90 80												
900/600 265/800.0 356/012 105/102 1001104 99<95												
8001500 18%4500 25%55 ⁴ 104 101 1001107 101110 97 93 100 94 93 94 93 97 94 91 99 92 92 93 87 87 88 94 96 101 97 90		1000	366.2	491	106	110	104			102		
7001400 125404.9 168348 103 99 107 101 101 101 97 92 96 91 99 92 93 94 94 96 94 96 96 91 93 94 94 90 92 91 93 94 94 90 90 90 90 92 <td></td> <td>8001500</td> <td>18tz236.0</td> <td>251,657</td> <td>10/101</td> <td>109110</td> <td>103101</td> <td>33</td> <td>98 01 07 93</td> <td>101 94</td> <td></td> <td>30</td>		8001500	18tz236.0	251,657	10/101	109110	103101	33	98 01 07 93	101 94		30
1300 804.6 1,0/9 97 102 97 90 90 90 90 90 90 90 90 90 90 90 88		7001400	125,604.9	168348	103 99	107 107	101 101					
1100 487.4 → 554 →94 101 →95 7 88 88 88 89 88 82 77 ENGIN00 ENGINE 267.0 ENGINE 257.0 ENGINE 257 POWER 187.5 POWER 18		1300	804.6	1,079	97	104	98	91	91	92	91	86
ENGINE00 SPEED0 RPM ENGINE 125.6 ENGINE POWER 125.6 558 251 OVER 80 558 125 ¹⁰⁰ 89 250 ⁹ HZ 98 HZ 98 HZ 86 HZ 86 HZ 85 100 ⁸ HZ 86 200 ⁸ HZ 86 400 ⁸ HZ 86 40 ⁸ HZ 86 40												85
ENGINE00 SPEED0 RPM ENGINE 125.6 ENGINE POWER 125.6 558 251 OVER 80 558 125 ¹⁰⁰ 89 250 ⁹ HZ 98 HZ 98 HZ 86 HZ 86 HZ 85 100 ⁸ HZ 86 200 ⁸ HZ 86 400 ⁸ HZ 86 40 ⁸ HZ 86 40		1100 100 5X	HAUST Sound	Pressure Dat	a (OBČF)			7 Mete	ers (° 2 3	0 Feet)		83
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		900	267.0	250		100	01	88	86			
RPM BKW BHP DB(A) DB <		ENGINE 800	ENGINE 187.5	ENGINE 251	OVERAL	125 98	250	500 86	1000	2000 84	4000 79	75
RPM BKW BHP DB(A) DB <		SPEED	POWER 125.6	POWER 168	89	н z ₉₇	нz ₈₈	н г ₈₅	HZ ₈₄	нz ₈₃	HZ ₇₈	н z ₇₄
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $								DB				
1400 1.004.9 1.348 99 107 101 92 91 92 93 88 1300 804.6 1.079 97 104 98 91 91 92 91 86 1200 632.8 849 96 102 97 90 90 90 88 83 1000 366.2 491 93 94 910 97 88 88 86 88 89 81 90 77 82 78 78 78 78 78 87 82 78 87 85 86 84 89 81 90 77 81 79 87 78									•			
1300 804.6 1.079 97 104 98 91 91 92 91 86 1200 632.8 849 96 102 97 90 90 90 90 88 88 88 83 1100 487.4 654 94 101 95 88 88 89 88 83 80 88 86 89 81 90 77 88 88 86 88 86 89 81 90 77 88 88 86 88 86 89 81 90 77 88 88 86 88 86 89 81 90 77 88 86 86 87 85 85 85 86 77 86 77 87 87 86 77 87 87 86 77 87 87 85 86 87 85 86 87 85 86 87 85 86 77 77 77 77 77 77 77												
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$ \begin{array}{c c c c c c c c c c c c c c c c c c c $												
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		1100	487.4	654	94	101	95		88	89	88	83
800 ¹⁵⁰⁰ 187,236.0 251,657 90 94 98 102 89 96 86 87 85 86 84 87 79 88 75 85 1300 125,604.9 165,348 89 92 97 100 88 94 85 84 83 85 78 86 74 87 1200 632.8 849 89 96 96 90 83 83 84 83 77 1100 487.4 654 88 94 89 96 90 83 83 84 83 77 1000 ENGINE 267.0 ENGINE 358 OVER & 125 90 125 83 100 80 100 80 77 <t< td=""><td></td><td>1000</td><td>366.2</td><td>491</td><td></td><td>101</td><td></td><td></td><td></td><td>- 00</td><td>- 00</td><td></td></t<>		1000	366.2	491		101				- 00	- 00	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		9001000	267.000.0	358012	32	100 103	51 00	00	00	00	01	11 00
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1100 1005 2487.4 (849.4 3487.4 (849.4 347.4 (849.4 3487.4 (849.4 3487.4 (849.4 3487.4 (849.4 347.4 (849.4 340.7 (849.4 340.7 (840.7 340.7 340.7		1300	804.6	1,079		97 97						80
$\begin{array}{c c c c c c c c c c c c c c c c c c c $					89							78
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		1100	487.4 HAUST Sound	654 Prossure Dat	a (OBČE)	94 Dist	89 ance:-	15 Mete	81 81 (49	2 Foot)		77
SPEEBOO RPM POWER BKW 101.5 BKW POWER 125.6 BHP 168 BHP 83 DB(A) HZ 02 DB HZ 77 DB HZ 77				250			84	81				71
RPMBKWBHPDB(A)DB		ENGINE	ENGINE 187.5	ENGINE 251	OVERAL	125 ⁹⁰ 92	250 ⁰⁴ 83	500 ⁰¹ 80	1000 ⁰⁰ 78	2000 ′ ³ 78	4000 ⁴ 73	8000 ⁷⁰ 69
RPMBKWBHPDB(A)DB		SPEED	POWER 125.6	POWER 168	83	н г ₉₁	нz ₈₂	нz ₇₉	Π ∠ 77	нz ₇₇	72	HZ 68
15001.236.01.6579410296878687888314001.004.91.348921009485848586811300804.61.07991979285858585801200632.884989969083838483781100487.465488948982818282771000366.24918694858281807571900267.03588593848180797470800187.52518492838078787369		RPM	BKW		. ,	DB	DB	DB	DB	DB	DB	DB
14001.004.91.348921009485848586811300804.61.07991979285858585801200632.884989969083838483781100487.465488948982818282771000366.24918694858281807571900267.03588593848180797470800187.52518492838078787369												
1300804.61.07991979285858585801200632.884989969083838483781100487.465488948982818282771000366.24918694858281807571900267.03588593848180797470800187.52518492838078787369												
1200632.884989969083838483781100487.465488948982818282771000366.24918694858281807571900267.03588593848180797470800187.52518492838078787369												
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900267.03588593848180797470800187.52518492838078787369												
800 187.5 251 84 92 83 80 78 78 73 69												
100 120.0 108 83 91 82 79 77 77 72 68												
		700	120.0	100	03	91	02	19	11	(1	12	00

	Perfor	mance Numbe	r: DM9255	Cł	nange Level:	01					
Sales Model:	3511200	1,500.0	2,012	103	99	Rated	l Spe@d (l	RPM)98 1	,600 98	96	100
Application:	MARINEP	ROPUL ¹ €16€N	1,657	102	98	Rated	Power (E	3 KW) ⁹⁷ 1	.500.87	95	99
		(MAXIM		102	97	Pator	d Powger (l	BHD) 2	97 012	95	98
Rating Level.			.,		98					93	97
	1200	632.8	849	101	97	94	90	95	96	93	96
	MECHAN	IICAL Sound	Pressure Dat	a (OBCE)	96 "Dist	94 ance ₃	1 Magte	rs (⁹⁴ ₉₄ 3.	3 Feget)	92	95
			050			02				91	95 04
		ENGINE 267.0	ENGINE 251	OVERAL	125 ⁹⁵	250 92	500 ⁸⁸	1000 ⁹³	2000 94	4000 ⁹¹	8000 94
	SPEED	POWER 187.5 125.6	POWER 168	98 97	HZ ⁹⁵ 94	нг ₉₂	нz ⁸⁸ ₈₇	HZ ⁹² 92	HZ ₉₃	HZ ₉₀	HZ ₉₃
	RPM	BKW	BHP	DB(Ă)	DB	DB	DB	DB	DB	DB	DB
	1600	1.500.0	2.012	103	99	98	95	98	98	96	100
	1500	1,236.0	1,657	102	98	97	94	97	97	95	99
	1400	1.004.9	1.348	102	97	96	93	96	97	95	98
	1300	804.6	1,079	101	98	95	91	96	96	93	97
	1200	632.8	849	101	97	94	90	95	96	93	96
	1100	487.4	654	100	96	94	89	94	95	92	95
	1000	366.2	491	99 99 91	96 95 87	93 92 86	89 88 83	94 93 86	95 94 86	91 01 84	95
	900 ¹⁶⁰⁰ 800 ¹⁵⁰⁰	267590.0 187236.0	3 38 012 251657	98 90	00	92 80 92 85	88 83 88 82	93 80 92 85	94 80 93 85	91 ⁸⁴ 90 83	94 88 94 87
	7001400	125094.9	168 ³⁴⁸	98 90 97 90	95 ⁸⁶ 94 85	92 88 91 ⁸⁴	88 02 87 81	92 80 92 84	93 85 93 85	90 83 90 83	94 87 93 87
	1300	804.6	1,079	89	94 86	83	79	92 01 84	85	81	85
	1200	632.8	849	89	85	82	78	83	84	81	84
	1100	487.4	654	88	84	82	77	,82	_ 83	80	83
	MEGHAN		Pressured	a (OBÇF)		ancĕ₁	7 Mjete		.0 Feget)	80	83
		ENGINE 267.0	ENGINE 358	overåll	125 ⁸³	250 ⁸⁰	500 76	1000 ⁸¹	2000 ⁸²	4000 ⁷⁹ HZ ₇₈	8000 ⁸²
	SPEED	POWER 187.5 125.6	POWER 251		H7°°	250 ⁸⁰ HZ ⁸⁰ 79	HZ 76	HZ ⁸¹	HZ ⁸¹	HZ ⁷⁸	H7 ⁰
	RPM	BKW 125.6	BHP 168	85 DB(A)	DB 82	HZ ⁰⁰ DB	DB 75	1000 ⁸¹ HZ ⁸¹ DB	HZ 81 DB	HZ 78 DB	DB 81
			2.012	91	87	86	83	86	86	84	88
	1600 1500	1.500.0 1,236.0	1,657	90	86	85	82	85	85	83	00 87
	1400	1,004.9	1,348	90	85	84	81	84	85	83	87
	1300	804.6	1.079	89	86	83	79	84	85	81	85
	1200	632.8	849	89	85	82	78	83	84	81	84
	1100	487.4	654	88	84	82	77	82	83	80	83
	1000	366.2	491	87	84	81	77	82	83	80	83
	9001600	267500.0	3£8012	87 85	83 81	80 80	76 77	81 80	82 80	79 78	82 82
	800 500	187236.0	251657	86 85	83 80	80 79	76 76	81 79	81 ⁸⁰	78 78	82 81
	7001400	125.004.9	168348	85 84	82 80	79 79	75 76	80 79	81 ⁷⁹	78 77	81 81
	1300 1200	804.6 632.8	1,079 849	83 83	80 79	77 77	73 72	78 77	79 78	76 75	79 78
	1200	487.4	654	82				77	79	73	78
	MEGHAN	IICAL Sound	Pressure		∕ <mark>∕</mark> i∯ist	76 anc q 5	⁷² 15 M∳ete		.2 Fejet)	74	77
		ENGINE 267.0	ENGINE 358	OVERALL	125 ⁷⁷ 77	250 ⁷⁵	500 70	1000 ⁷⁵	2000 ⁷⁶	4000 ⁷³	8000 ⁷⁶
	SPEED	DOWED 107.0	POWER 251		U7''	250 ₇₄ HZ ₇₃	HZ ⁷⁰ HZ ⁶⁹	HZ ⁷⁵ HZ ₇₄	2000 HZ ₇₅	HZ ₇₂	HZ 75
	RPM	BKW 125.6	BHP 168	80 DB(A)	76 DB	DB	DB	DB ⁷⁴	DB	DB	DB 75
	1600	1,500.0	2,012	85	81	80	77	80	80	78	82
	1500	1.236.0	1.657	85	80	79	76	79	80	78	81
	1400	1,004.9	1,348	84	80	79	76	79	79	77	81
	1300	804.6	1.079	83	80	77	73	78	79	76	79
	1200	632.8	849	83	79	77	72	77	78	75	78
	1100	487.4	654	82	79	76	72	77	78	74	78
	1000	366.2	491	82	78	75	71	76	77	74	77
	900	267.0	358	81	77	75	70	75	76	73	76
	800	187.5	251	80	77	74 70	70	75	76	72	76
	700	125.6	168	80	76	73	69	74	75	72	75

Data Date: 3/29/2011

TORSIONAL VIBRATION DATA

	3500 DAMPER SELECTION MATRIX FOR MARINE APPLICATIONS									
Damper Group	Damper Part No.	Damper Adapter	Adapter Inertia (kgm²)	Damper hsg. Inertia (kgm²)	Damper Ring Inertia (kgm²)	Engine	Stiffness (MNm/rad)	Damping (Nmsec/rad)	Surface Area (m²)	
						D3508	0.367	508		
8N-7182 (21")	193-3288	7W-3409	0.555	1.15	1.639	D3512	0.169	565	0.314	
(=-)					3516	0.328	650			
						3508	0.75	1300		
8N-0339 (23")	146-3740	1N-3482	0.216	3.327	5.616	3512	0.4	1000	0.553	
(207					3516	0.429	1130			
						3508	0.75	1300		
125-9749 (23")	171-4571	1N-3482	0.216	3.327	5.616	3512	0.4	1000	0.562	
(20)						3516	0.429	1130		
240-7762						3512	See HCF	See HCF		
(23" HCF)	244-4508	1N-3482	0.216	3.27	5.81	3516	Damper Table	Damper Table	0.562	
248-0197	047.0045	111.0400	0.010	0.07		3512	See HCF	See HCF	0 500	
(23" HCF)	$1 - \frac{1}{24} - \frac{1}{1845} + \frac{1}{18482} + \frac{1}{10216} + \frac{3}{277} + \frac{5}{10845} + \frac{1}{10216} + $	3516	Damper Table	Damper Table	0.562					

Permissible Damper Loading:

Thermal breakdown of silicone fluid can occur at temperatures above 100°C. Therefore, the permissible damper load values are estimated based on this limit. The permissible damper loading values (kW/m²) depend on the damper surface area, ambient temperature, and engine speed. For estimating the permissible damper loads, we assumed ambient temperatures of 50°C and 65°C with reasonably good ventilation around the damper.

Allowable damper thermal load for 21" damper @ 50°C and @ 65°C:

The allowable heat load varies somewhat linearly with engine speed.

- * 50°C \rightarrow 800 rpm 2.8 kW/m², 2100 rpm 6.1 kW/m²
- $65^{\circ}C \rightarrow 800 \text{ rpm}$ 2.2 kW/m², 2100 rpm 4.8 kW/m²

Allowable damper thermal load for 23" damper @ 50°C and @ 65°C:

The allowable heat load varies somewhat linearly with engine speed.

- * 50°C \rightarrow 800 rpm 3.4 kW/m², 2100 rpm 7.3 kW/m²
- * $65^{\circ}C \rightarrow 800 \text{ rpm}$ 2.6 kW/m², 2100 rpm 5.8 kW/m²

	HCF DAMPER TABLE GROUP 240-7762, DAMPER 244-4508 STIFFNESS (MNm/rad)												
Temp.													
(°C)	5	10	20	30	40	50	60	70	80	120	140	160	180
32	.145	.207	.297	.366	.425	.477	.524	.568	.608	.750	.813	.871	.926
40	.122	.178	.261	.326	.382	.431	.477	.519	.559	.698	.760	.818	.873
50	.099	.149	.224	.284	.336	.383	.427	.467	.505	.642	.702	.760	.814
63	.077	.120	.186	.240	.288	.332	.373	.411	.448	.579	.638	.695	.749
80	.057	.092	.149	.197	.240	.280	.318	.353	.387	.512	.569	.624	.677
100	.042	.070	.118	.159	.198	.234	.268	.300	.332	.450	.505	.557	.609
125	.029	.052	.091	.126	.159	.191	.222	.251	.280	.389	.441	.492	.541

	HCF DAMPER TABLE GROUP 240-7762, DAMPER 244-4508 DAMPING (Nmsec/rad)												
Temp.						Fr	equency (l	ız)					
(°C)	5	10	20	30	40	50	60	70	80	120	140	160	180
32	14349	8791	5385	4043	3299	2818	2477	2221	2021	1518	1361	1238	1139
40	12874	7998	4969	3761	3087	2648	2337	2102	1918	1452	1306	1191	1099
50	11328	7154	4518	3453	2853	2461	2181	1969	1802	1377	1243	1138	1053
63	9702	6250	4027	3114	2594	2252	2006	1819	1671	1292	1172	1077	999
80	8060	5318	3509	2751	2315	2025	1815	1655	1528	1198	1092	1008	939
100	6622	4481	3032	2413	2052	1809	1633	1497	1388	1105	1013	940	879
125	5325	3706	2579	2086	1795	1597	1452	1339	1279	1010	932	869	817

	HCF DAMPER TABLE GROUP 248-0197, DAMPER 247-0845 STIFFNESS (MNm/rad)									
Temp.					Freque	ncy (hz)				
(°C)	30	40	50	60	70	80	120	140	160	180
32	.366	.425	.477	.524	.568	.608	.750	.813	.871	.926
40	.326	.382	.431	.477	.519	.559	.698	.760	.818	.873
50	.284	.336	.383	.427	.467	.505	.642	.702	.760	.814
63	.240	.288	.332	.373	.411	.448	.579	.638	.695	.749
80	.197	.240	.280	.318	.353	.387	.512	.596	.624	.677
100	.159	.198	.234	.268	.300	.332	.450	.505	.557	.609
125	.126	.159	.191	.222	.251	.280	.389	.441	.492	.541

	HCF DAMPER TABLE GROUP 248-0197, DAMPER 247-0845 DAMPING (Nmsec/rad)										
Temp.					Freque	ncy (hz)					
(°C)	30	40	50	60	70	80	120	140	160	180	
32	4043	3299	2818	2477	2221	2021	1518	1361	1238	1139	
40	3761	3087	2648	2337	2102	1918	1452	1306	1191	1099	
50	3453	2853	2461	2181	1969	1802	1377	1243	1138	1053	
63	3114	2594	2252	2006	1819	1671	1292	1172	1077	999	
80	2751	2315	2025	1815	1655	1528	1198	1092	1008	939	
100	2413	2052	1809	1633	1497	1388	1105	1013	940	879	
125	2086	1795	1597	1452	1339	1279	1010	932	869	817	

3500 ATTACHMENT SELECTION MATRIX FOR MARINE APPLICATIONS									
Name/Feature Code	Part Number	Inertia (kgm²)							
Flywheel	243-3216	14.61							
Flywheel	243-3221	14.61							
Flywheel	1N-3770	5.875							
Flywheel	7N-7732	5.875							
CRKPL01 (crankshaft pulley 197 mm)	7N-4106	0.060							
CRKPL02 (crankshaft pulley 248 mm)	8N-6564	0.119							
SHAFT01 (low hp stub shaft)	7N-7057	0.0598							
SHAFT02 (high hp stub shaft)	7W-3579	0.158							
UDDDUE0 (budgeulie numm meunting)	Adapter 7W-0287	0.112							
HPDRHF0 (hydraulic pump mounting)	Coupling 2W-8014	0.536							
HPDPHE2 (bydraulia pump mounting)	Adapter 7W-3415	0.524							
HPDRHF2 (hydraulic pump mounting)	Coupling 2W-8014	0.536							
	Clutch 3N-4130	0.123 (2 drive plates)							
EDENICLE (front on closed clutch w/21" domney)	GIULCH 3IN-4130	0.867 (total)							
FRENCL6 (front enclosed clutch w/21" damper)	Coupling 2W-8014	0.536							
	Adapter 7W-3415	0.524							
	Clutch 3N-4130	0.123 (2 drive plates)							
EDENICLY (front on closed clutch us/22" -t	GIUTEN 31N-4130	0.867 (total)							
FRENCL7 (front enclosed clutch w/23" damper)	Coupling 2W-8014	0.536							
	Adapter 7W-0287	0.112							

	3500 HARMONIC CON	/IPONENTS ¹ /TANGENTIAL P	RESSURES/CYLINDER			
Harmonic Order		omponent Ferm (kPa)	Imaginary Component Sine term (kPa) ²			
	0.0 kPa (BMEP)	2068.5 kPa (BMEP)	0.0 kPa (BMEP)	2068.5 kPa (BMEP)		
0.5	54.34	579.05	-87.62	-577.74		
1	30.56	305.24	-145.48	-1061.48		
1.5	10.13	54.76	-171.59	-921.34		
2	-1.09	-87.08	-149.26	-790.93		
2.5	-8.99	-107.22	-151.22	-626.96		
3	-10.36	-110.25	-127.89	-512.18		
3.5	-12.51	-118.58	-112.43	-415.31		
4	-13.44	-120.67	-93.35	-319.32		
4.5	-13.67	-111.17	-73.66	-242.57		
5	-10.92	-94.38	-61.55	-193.66		
5.5	-9.89	-85.87	-51.41	-153.76		
6	-8.04	-79.28	-44.10	-115.29		
6.5	-6.67	-64.78	-37.80	-85.72		
7	-5.27	-54.05	-32.00	-67.68		
7.5	-4.56	-48.26	-26.59	-53.93		
8	-3.71	-44.17	-21.97	-38.72		
8.5	-2.98	-35.89	-18.09	-27.37		
9	-2.22	-29.86	-14.91	-21.88		
9.5	-2.09	-26.77	-12.55	-17.63		
10	-2.22	-24.77	-10.52	-12.01		
10.5	-1.86	-18.99	-8.53	-7.86		
11	-1.52	-16.71	-7.54	-6.61		
11.5	-1.24	-15.28	-6.55	-5.87		

¹Table includes gas only harmonics; inertial harmonics are not included. The Harmonic Components are determined by calculating the engine's BMEP for the load case being analyzed, then interpolating from the above table.

²See notes on Caterpillar sign convention for TVA on pages 133-134.

Engine Front End Amplitude Limits

+/- 1.00 degree for 0.5 and 1st orders

+/- 0.25 degree for 1.5 order

+/- 0.15 degree for all other orders above 1.5

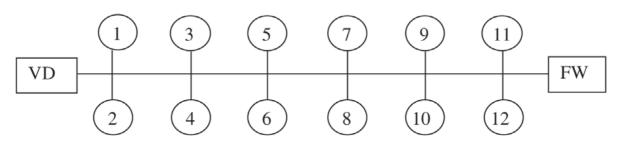
Crankshaft Stress Limits

+/- 21 Mpa for single order

In the event that the above limits are exceeded, the customer must contact Caterpillar!

3512 Torsional Vibration Data Marine Applications

3512 Cylinder Numbering



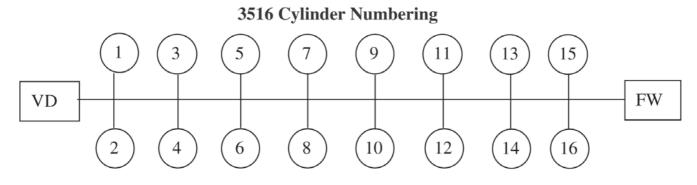
3512 CYLINDER PHASE ANGLES (FIRING ORDER)									
Cylinder Number	Phase Angle (degrees)								
Cynnuer Munimer	Std. Rotation CCW	Rev. Rotation CW							
1	0	0							
2	420	300							
3	480	480							
4	180	60							
5	240	240							
6	660	540							
7	600	600							
8	300	180							
9	120	120							
10	540	420							
11	360	360							
12	60	660							

Caterpillar TVA Sign Convention

Engines are usually viewed from the rear, at which point the crankshaft is rotating counterclockwise (CCW). This view creates **leading sign convention**, whereas most mathematical systems work with a **lagging sign convention**. Therefore the signs (+ve or -ve) for imaginary components of tangential pressures based on the sign convention of the Caterpillar TVA

will be different from most of the commercial FFT programs. Analysts performing torsional analysis using torsional codes other than Caterpillar TVA code need to consult Caterpillar regarding the sign convention before using the values given in this table.

3516 Torsional Vibration Data Marine Applications



3512 CYLINDER PHASE ANGLES (FIRING ORDER)								
Outinday Nurshay	Phase Angl	e (degrees)						
Cylinder Number	Std. Rotation CCW	Rev. Rotation CW						
1	0	0						
2	60	660						
3	180	180						
4	240	120						
5	90	90						
6	150	30						
7	630	630						
8	690	570						
9	270	270						
10	330	210						
11	450	450						
12	510	390						
13	540	540						
14	600	480						
15	360	360						
16	420	300						

Caterpillar TVA Sign Convention

Engines are usually viewed from the rear, at which point the crankshaft is rotating counterclockwise (CCW). This view creates **leading sign convention**, whereas most mathematical systems work with a **lagging sign convention**. Therefore the signs (+ve or -ve) for imaginary components of tangential pressures based on the sign convention of the Caterpillar TVA will be different from most of the commercial FFT programs. Analysts performing torsional analysis using torsional codes other than Caterpillar TVA code need to consult Caterpillar regarding the sign convention before using the values given in this table.

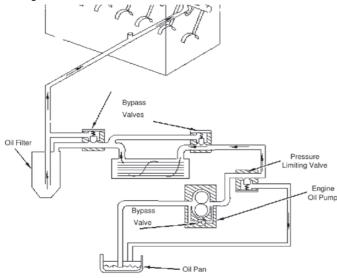
LUBRICATION OIL SYSTEM

GENERAL

The lube system is designed to provide a constant supply of filtered oil from 570 to 630 kPa (83 to 91 psi) pressure under all engine operating conditions. The lube system contains an oil cooler, oil filter, gear-driven oil pump, pre-lube pump and an oil pan that meets marine tilt requirements.

INTERNAL LUBRICATION SYSTEM

This system uses an engine oil pump with three pump gears. The pump gears are driven by the front gear train. Oil is pulled from the pan through suction bell and through the elbow by the engine oil pump. The suction bell has a screen in order to clean the engine oil.



There is an engine oil relief valve in the engine oil pump. The engine oil relief valve controls the pressure of the engine oil from the engine oil pump. The engine oil pump can put too much engine oil into the system. When there is too much engine oil, the engine oil pressure goes up and the relief valve opens. This allows the engine oil that is not needed to go back to the inlet oil passage of the engine oil pump.

The engine oil pump pushes engine oil through the engine oil cooler and through the engine oil filters to the main oil gallery and through the camshaft oil gallery. The engine oil cooler lowers the temperature of the engine oil before it is sent to the filters.

The engine oil cooler bypass valve allows engine oil to flow directly to the filters if the engine oil cooler becomes plugged. The engine oil cooler bypass valve also allows engine oil to flow directly to the filters if the engine oil becomes thick. The engine oil cooler bypass valve will bypass the engine oil to the filters above 180 \pm 20 kPa (26 \pm 3 psi) of oil pressure differential.

Cartridge type filters are used. The filters are located in an engine oil filter housing. Cartridge type filters use a single bypass valve that is located in the engine oil filter housing.

Clean engine oil from the filters flows through the engine oil line and into the block through the elbow. Part of the engine oil flows to the left camshaft oil gallery. The remainder of the engine oil flows to the main oil gallery.

The main oil gallery and left camshaft oil gallery are connected to each camshaft bearing by a drilled hole. The engine oil flows around each camshaft journal. The engine oil then travels through the cylinder head and through the rocker arm housing to the rocker arm shaft. A drilled hole connects the bores for the valve lifters to the oil hole for the rocker arm shaft. The valve lifters are lubricated at the top of each stroke.

The main oil gallery is connected to the main bearings by drilled holes. Drilled holes in the crankshaft connect the main bearing oil supply to the rod bearings. Engine oil from the rear of the main oil gallery goes to the rear of right camshaft oil gallery.

Sequence valves allow engine oil from the main oil gallery to flow to the piston cooling jet galleries. The sequence valves begin to open at approximately 130 kPa (19 psi). The sequence valves will not allow engine oil into the piston cooling jet galleries until there is pressure in the main oil gallery. This decreases the amount of time that is necessary for pressure buildup when the engine is started. This also helps hold pressure at idle speed.

Oil Pump

The oil pump provides high-pressure oil flow to the engine. Oil is drawn up from the sump by the oil pump. There is a pressure relief valve on the outlet of the of oil pump that will open and feed the oil back to the inlet side of the pump. The oil pump is designed to deliver more oil to the engine than what is required. This way the engine still receives the correct amount of oil even if the pump is slightly worn. The ECU is programmed to first give a warning of low lube oil pressure then shut the engine down. A map of engine oil pressure versus engine rpm gives the pressure at which the engine is shut down.

Prelubrication (Optional Caterpillar Supply)

A prelubrication electric pump is available from Caterpillar if the operator requires one. It is highly advisable to fit a prelubrication sump pump to the engine. This electric prelube system uses a package-mounted pump that is engaged immediately prior to engine start-up.

The prelubrication pump will fill the engine galleries from the engine oil sump until the presence of oil is sensed at the upper portion of the lubrication system. A prelubrication pump will minimize the sometimes severe engine wear associated with starting the engine after periods of idleness.

3500 series engines do not require prelubrication before starting. Not having prelubrication pumps installed will not affect engine maintenance or warranty.

Lubricating Oil Cooler

The lubricating oil cooler controls the temperature of the oil that's delivered to the engine. This cooler is cooled via the jacket water. The flow of oil through the cooler is controller by an oil temperature regulator control valve. To reduce the risks of contamination the lube oil is supplied to the cooler at a higher pressure then that of the jacket water.

Oil Filter

From the lube oil cooler the engine oil passes through the primary engine oil filters before passing through the engine oil ways and returning to the engine's sump. Caterpillar supplies the primary lubricating oil filter as standard. The ECU will automatically warn the operator of high fuel filter differential pressure. The default setting is 105 kPa but this can be programmed to other values if required.

Centrifugal Lube Oil Filter (Optional Caterpillar Supply)

If required, Caterpillar can supply a centrifugal oil filter which is designed to remove soot and other fine particles. This would be used in addition to the engine lube oil filter/lube oil duplex oil filters. This would be highly recommended to increase oil life on high-hour commercial applications where a separator is not present.

Duplex Filters – Class Requirement (Optional Caterpillar Supply)

Many Cat engines can be equipped with duplex oil filters, which can be serviced without shutting off the engine. There are two types: the symmetrical type, which has two identical filter sets, and the main auxiliary type, which has a main filter set and a smaller capacity auxiliary set.

It is possible to run both filter sets simultaneously to extend running time in an emergency. One set of filters is required to satisfy the requirements of classification societies.

Note: If duplex lube oil filters are fitted, they will replace the standard lube oil filters that are fitted on the engine.

Emergency Oil Standby Pump

3500 series engines are available with optional connections for emergency oil pumps. These options are available in the pricelist and can be selected at the time of order.

Emergency oil pumps are connected in parallel with the engine oil pump. The oil is pulled directly from the oil pan and must re-enter the lubrication system before the oil cooler and oil filters. Use caution when deciding to install and use emergency oil pumps as further damage may occur, depending on the cause of the original oil pump failure and the resultant damage.

Emergency Connections – Class Requirement (Optional Caterpillar Supply)

Caterpillar can supply the emergency connections required for emergency lube oil operation.

Emergency Pump – Class Requirement (Optional Cat Dealer Supply)

The Cat dealer is able to supply the emergency pump required to maintain lube oil pressure and circulation, should the enginedriven pump fail.

Oil Mist Detector (Optional Caterpillar Supply)

It is not a classification requirement for an oil mist detector to be fitted to all 3500C series engines. Classification societies require an oil mist detector on any engines that produce more than 2250 bkW. An oil mist detector is required to give early indication of a potential hot spot with the engine's crankcase. Activation of the alarm will enable the operator to take action to prevent damage being caused to the engine.

If an owner specifically requires an oil mist detector (OMD) alarm for a lower powered engine, it should be possible for Caterpillar to fit an OMD at the factory when the engine is manufactured. Consultation with Caterpillar would be required to establish additional costs to the engine build.

Please Note: An OMD will be required for the 3516C series engine as these engines are above the 2250 bkW power threshhold set by classification societies. It can be selected as an option when the order is placed for the engine.

Caterpillar will supply the engine with a fitted OMD if a 3516C series engine is to be prepared to classification society standards.

External Lube Oil Piping

When installing auxiliary elements to the 3500 lube oil on-engine system, external piping will be fitted by the shipyard. These auxiliary elements can be:

- External lube oil storage tanks
- · Lube oil purifier
- Emergency oil standby pump

For a good engine performance when fitting external lube oil pipes please follow the following recommendations:

- · Keep pressure drops to a minimum by using short, low restriction lines.
- Use a line size at least as large as the engine connection point.
- · Install a low restriction strainer in front of the auxiliary element.
- · Install a low restriction check valve between the auxiliary element discharge and the engine inlet connection.
- · Use a pressure limiting valve in the external equipment set at the maximum oil pressure limit of the engine.
- Follow flushing procedures according to this project guide.

It is a SOLAS requirement that all low-pressure oil lines going to and from the filters are screened to prevent lube oil spraying near hot surfaces that will cause ignition. It is the responsibility of the shipyard that any lube oil connections made on board the ship meet the SOLAS minimum requirements.

Sump Pump (Optional Cat Dealer Supply)

If required, Caterpillar can supply a hand-operated sump pump to assist in changing the engine's lube oil. The Cat dealer is able to supply a 24 volt electrically driven sump pump to assist in changing the engine lube oil.

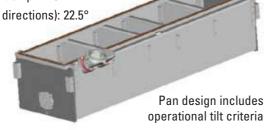
Deep Sump Oil Pan (Optional Caterpillar Supply)

Caterpillar can supply the engine with a deep sump oil pan to double oil change times. In some case where the engines are fitted in an inclined installation such as fishing vessels it is necessary to add a deep sump to ensure the engine is capable of drawing the required amount of lube oil.

Inclination Capability

For marine applications with tilt requirements, the Cat 3500C marine engine uses a deep wet sump and provides:

- Static fore/aft: 15°
- Static athwart ship: 22.5°
- Dynamic (all directions): 22.5°



Customer Piping Connections

Engine Connections

• Oil fill and drain: 38 mm (1-1/2 in. 12 TAP)

Oil Requirements

Due to significant variations in the quality and performance of commercially available lubrication oils, Caterpillar recommends the oils listed in the following table for the 3500C engine. Additional information can be found in publication PEHJ0059.

CAT® DEO (DIESEL ENGINE OIL) FOR 3500C DIESEL ENGINE				
SAE Viscosity	TBN	Ambient Temperature		
Grade		Minimum	Maximum	
SAE 15W-40	11.3	-9.50°C (15°F)	50°C (122°F)	
SAE 10W-30	11.3	-18°C (0°F)	40°C (140°F)	

Use of Commercial Oil

Caterpillar does not recommend the names of other commercial brands of lube oils, but has established guidelines for their use. Commercially available lubrication oils may be used in Cat 3500 engines, but they must have proof of performance in Caterpillar field performance evaluation, included in Cat document SEBU6251.

Oil Change Interval

To achieve maximum life from the engine oil and provide optimum protection for the internal engine components, a Scheduled Oil Sampling analysis (S•O•S[™]) should be used. This program is available through the Cat dealer network. If an S•O•S analysis program is not available, the oil change interval is recommended in accordance with the following table.

OIL CHANGE INTERVALS FOR 3500C DIESEL ENGINES				
Engine Model	Lube Oil Capacity	Oil Change Interval		
3512C	625 L (165 gal)	1000 Service Hours		
3516C	807 L (213 gal)	1000 Service Hours		

Scheduled Oil Sampling

TBN, viscosity and oil consumption trends must be analyzed every 250 hours. The S•O•S analysis involves a two-part test program:

- Wear Analysis. The wear analysis identifies engine wear ٠ elements present in the oil. These elements indicate the condition of the engine.
- Oil Condition Analysis. The oil condition analysis identifies the wear status of the oil. The program will determine oil change intervals based on trend analysis and condemning limits established for the engine.

Change Interval without Oil Analysis Results

• If S•O•S analysis results are not available, the initial oil change interval should be used to determine oil change intervals. Even though oil sampling results may not be available on the recommended 250-hour intervals, oil samples should be analyzed at every oil change period, even if the turnaround time for the data is long.

CRANKCASE EMISSIONS

CLOSED CRANKCASE VENTILATION (CCV)

Crankcase emissions result from combustion byproducts and/ or exhaust fumes escaping around the piston rings and into the crankcase, commonly called blow-by. If not controlled, this blowby can contaminate the lube oil and pressurize the crankcase, possibly leading to an oil leak.

Venting the emissions to the atmosphere is a simple solution to release the pressure and trapped fumes. Managing the emissions, however, adds complexity to crankcase ventilation systems.

Current 3500C diesel engines are provided with a closed-loop, on-engine crankcase filtration system.

In combination with Caterpillar 3500C high efficiency on fuel delivery, air management, electronics, and combustion design, the closed crankcase filtration system improves the exhaust emissions reductions by eliminating crankcase emissions.

The Closed Crankcase Ventilation (CCV) fumes disposal is equipped with a service indicator. If the fumes disposal filter becomes plugged prior to the normal service interval, increased restriction of the filter will cause the vacuum to become positive. When the pressure continues to rise, the service indicator will show through the cap. The service indicator indicates the need for the fumes disposal filter to be changed.

For the current data on the lube system please reference LEBW4958 in Electronic Media Center.

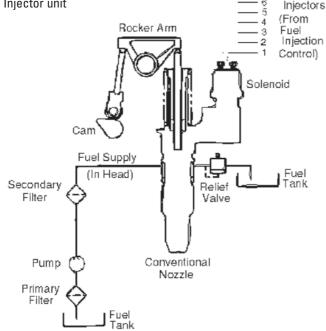
For safety, crankcase relief valves are installed on CCV engines.

FUEL SYSTEM

GENERAL

The 3500C engine uses a direct injection fuel system, electronically controlled. The major components of the fuel system are:

- Fuel tank
- Primary filter
- · Fuel pump
- Secondary filter
- · Injector unit



Fuel Tank

Signals

To Fuel

The supply system must assure a continuous, clean supply of fuel. The tanks should not exceed the height of the engine fuel injectors in order to prevent possible leakage of fuel into the cylinders. If a higher position is required, check valves with backpressures set to the fuel column height must be installed.

Cat fuel transfer pumps lifting capability is equivalent to 40 kPa (5.8 psi) inlet restriction.

Fuel Transfer Pump

The fuel supply circuit uses a fuel transfer pump to deliver fuel from the fuel tank to the electronic fuel injectors. The transfer pump is a fixed displacement gear pump with a 21 L/min capacity at 415 kPa and 2400 rpm. The minimum bypass cracking pressure is 620 kPa and the maximum bypass full-open pressure is 965 kPa.

The fuel pump delivers more fuel to the engine then what's required at maximum load, with the excess fuel being returned to the day tank. The excess fuel removes heat from the injectors and cools the engine's pipe work.

Fuel Filters

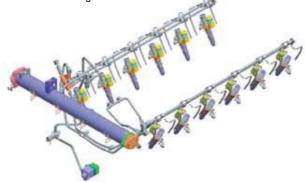
The fuel passes through a primary set of engine fuel filters that are on the engine before entering the fuel manifold. The ECU will automatically warn the operator of high fuel filter differential pressure. The default setting is 105 kPa but this can be programmed to other values if required.

Unless otherwise specified the engine will be supplied from Caterpillar with standard spin oil fuel filters. It is highly recommended that operators fit Duplex filters to the engine.

Please Note: Duplex filters are a class requirement.

Secondary Filter

The fuel flows through a 4-micron fuel filter before entering the fuel supply manifold. A fuel priming pump is located on the fuel filter base in order to fill the system. The system must be primed after the filter changes.



Fuel Pressure Regulating Valve

A pressure-regulating valve maintains a fuel pressure in the manifold of 415 to 450 kPA (60 to 65 psi). This is the pressure that is required to ensure proper filling of the injectors.

Electric Fuel Injector Units

The fuel injector units are controlled by the ECU for precise timing and delivery of the fuel.

The fuel flows continuously from the fuel supply manifold through the fuel injectors. The fuel flows when either the supply or the fill port in the injector is not closed by the injector body assembly plunger. The fuel that is not injected into the cylinder is returned to the tank through the fuel return manifold.

EXTERNAL FUEL SYSTEM DESIGN CONSIDERATIONS

Diesel fuel supply systems must ensure a continuous and clean supply of fuel to the engine's fuel system. The fuel system is designed for distillate fuel, requiring viscosity ranging from 1.4 cSt to 20 cSt at 38°C (100°F). The external fuel system typically has three major components: a fuel storage system, a fuel transfer system and fuel filtration system; and each of these systems demand careful attention to ensure the success of each installation.

Fuel Storage System

The minimum pressure at the transfer pump is:

- -40 kPa(g) with dirty primary filters
- -20 kPa(g) with clean primary filters
- The maximum pressure is 30 kPa(g).

Cat fuel transfer pumps' lifting capability is equivalent to 40 kPa inlet restriction.

Fuel Transfer System

Line Restriction – The piping carrying fuel to the fuel transfer pump and the return line carrying excess fuel to the tank should be no smaller than the engine connections. The maximum inlet flow restriction is 20 kPa at rated speed. Air in the system causes hard starting and erratic engine operation and will erode injectors.

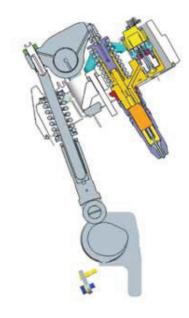
Return Line – The return line should enter the top of the tank without shutoff valves. Bypass (return) fuel leaving the engine pressure regulator should be returned to the engine day tank. The maximum allowable fuel return line restriction is 60 kPa.

Fuel Filtration System

Primary Fuel Filter – Caterpillar requires the use of a primary filter/separator prior to the fuel booster pump. On-engine filtration consists of a secondary 4-micron fuel filter.

The MEUI system provides total electronic control of injection timing. The injection timing is varied to optimize the engine's performance.

The timing ring is part of the rear gear group. The engine speed/ timing sensor monitors the timing ring for detection of crankshaft position and for engine speed. Other information and this data allow the ECU to correctly send a signal to the injector solenoids. The fuel injector's solenoid is energized in order to begin fuel injection. The fuel injector's solenoid is de-energized to end fuel injection.



Miscellaneous Fuel System Considerations

Flexible Connections – Connections to the engine must be flexible hose and must be located directly at the engine inlet and outlet to accommodate engine motion.

Fuel Temperature – Engines are power set at the factory with 66°C (151°F) fuel to the engine transfer pump. Higher fuel temperatures will reduce fuel stop power capability. The "fuel stop" power reduction is 1% for each 5.6°C (10°F) fuel supply temperature increase above 30°C (86°F). If the engine is operating below the "fuel stop" limit, the governor will add fuel as required to maintain the required engine speed. The classification societies have a maximum return to tank fuel temperature. This temperature is related to the fuel flash point. The minimum allowable viscosity of the fuel entering the engine is 1.4 cSt.

Fuel Coolers – The 3500C has minimal fuel heat rejection therefore the need for fuel coolers is project-specific and depends greatly on day-tank size and location. Calculations for determining the need for a fuel cooler are contained in publication LEBW4976 (Diesel – Fuels and Fuel Systems) and publication REHS4726. Refer to the following table for fuel heat rejection data. If a heat exchanger is used, it must not contain copper. When copper comes in contact with the fuel it has been found to cause issues with the 3500C engines. The max fuel inlet temp is 70°C.

FUEL COOLER FUEL FLOW AND HEAT REJECTION					
Engine	Engine Rated Speed Max Fuel Flow Fuel Heat to Return Line Rejection				
3500C	1600-1800 rpm	20.41 L/min (5.37 U.S. gal/min)	0.123 kW (40 Btu/min)		

Fuel Coolers (Optional Cat Dealer Supply)

The need for fuel coolers is project-specific and depends greatly on day-tank size and location.

The excess fuel returned to the fuel tank picks up heat from the injectors and cylinder heads and over a period of time can raise the temperature of the fuel with in the tanks.

To avoid decreased injector life, fuel temperature to the engine must not exceed 150°F (66°C). Caterpillar has started to deliver on-engine plate-type heat exchangers that can cool the engine's jacket water as well as the fuel. In installations where off-engine heat exchangers are used, the Cat dealer is able to supply fuel coolers.

Only if the periods of operation are short will the heat returned to the tank have time to dissipate. If this is the case a fuel cooler may not be required.

Flexibles (Optional Caterpillar Supply)

Flexibles are the fixed pipe work on board the ship that are connected to the engine via flexible fuel lines. The flexible fuel lines can be supplied by Caterpillar. These can be supplied with classification society type approval certificates if required.

Check Valves (Optional Cat Dealer Supply)

If the fuel tank is positioned above the height of the fuel injectors, it will be necessary to install a check valve on both the supply and return lines. If these are not fitted, there is chance that if the engine had a leaky injector and fuel could leak in to the cylinder space when the engine was stopped. Starting the engine in a case like this would lead to a complete failure of the engine.

Duplex Filters – Class Requirement (Optional Caterpillar and Dealer Supply)

3500 series engines can be equipped with duplex fuel filters. These filters may be serviced without shutting off the engine. There are two types: the symmetrical type, which has two identical filter sets, and the main-auxiliary type, which has a main filter set and a smaller capacity auxiliary set.

It is possible to run both filter sets simultaneously to extend running time in an emergency. Typically, two set filters are supplied in the fuel system to satisfy the requirements of classification societies.

Generally, Caterpillar supplies the duplex filters on the engine, replacing the primary fuel filters that are supplied with the engines as standard. The duplex filters off the engine are supplied by the Cat dealer.

Emergency Operation

Some marine applications require the capability to connect an emergency fuel pump to the engine's fuel system. This is a specific requirement of some classification societies for seagoing single propulsion engine applications. The purpose is to ensure fuel oil pressure and supply if the engine-driven fuel oil pump fails.

Emergency Connections (Optional Cat Dealer Supply)

The Cat dealer would be able to supply emergency connections should the operator require a standby fuel oil pump in the system.

Emergency Pump (Optional Cat Dealer Supply)

The Cat dealer is able to supply the emergency pump required to maintain the fuel oil pressure and supply, should the enginedriven pump fail.

SOLAS Requirements

SOLAS (Safety Of Life At Sea) is a regulation designed to maintain safety of life at sea. A new regulation was introduced in July, 2003 regarding the mandatory use of double-wall, highpressure fuel lines, hot surface insulation, and improved joint screening. This was introduced to reduce the risk of fire in engine rooms caused by marine engines. (Please refer to SOLAS Ch. II-2 Part A Regulation 15.2.9-11, 15.3 and 15.4).

3500C series engines use a low-pressure fuel system, so it is not a requirement for them to have double-walled fuel lines. The fuel line connections before and after the filters mounted on the engine are to be adequately shielded to prevent pressurized fuel being sprayed onto hot surfaces.

The SOLAS tape can be applied in the factory if required, offered as an option on the quoting systems. If this is not done at the factory, the Cat dealer can fit the tape; however, this is quite a labor-intensive process.

Please Note: This has also been a requirement of certain classification societies for a number of years.

Fuel Shield for Fire Hazard at Sea Prevention

To increase safety regarding fire hazard at sea according to SOLAS rules, a fuel shield is fitted on 3500C TIER 3 engines to guarantee a good protection at the connecting point on the engine for fuel lines, both supply and return. Caterpillar fuel shield design guarantees a perfect alignment between the shield itself and the fuel lines in order to avoid possible wear points because of rubbing of the shield.



246-0457 Shield Group



246-0456 Shield Group



Fuel Recommendations

The fuels recommended for use in Caterpillar 3500C series diesel engines are No. 2-D diesel fuel and No. 2 fuel oil. Refer to publication SEBU6251 for additional explanation of acceptable fuels.

Customer Piping Connections

Engine Fuel Line Connections

- Fuel Supply: 3/4 14 NPSM THD
- Excess Fuel Return: 1/2 14 NPSM THD

Fuel Recommendations

The fuels recommended for use in Caterpillar 3500C series diesel engines are normally No. 2-D diesel fuel and No. 2 fuel oil, although No. 1 grades are also acceptable. Table 4 lists worldwide fuel standards which meet Caterpillar requirements.

Fuel with CIMAC designation DB, commonly referred to as Marine Diesel Oil (MDO), is an acceptable fuel, provided the fuel complies with Caterpillar fuel recommendations.

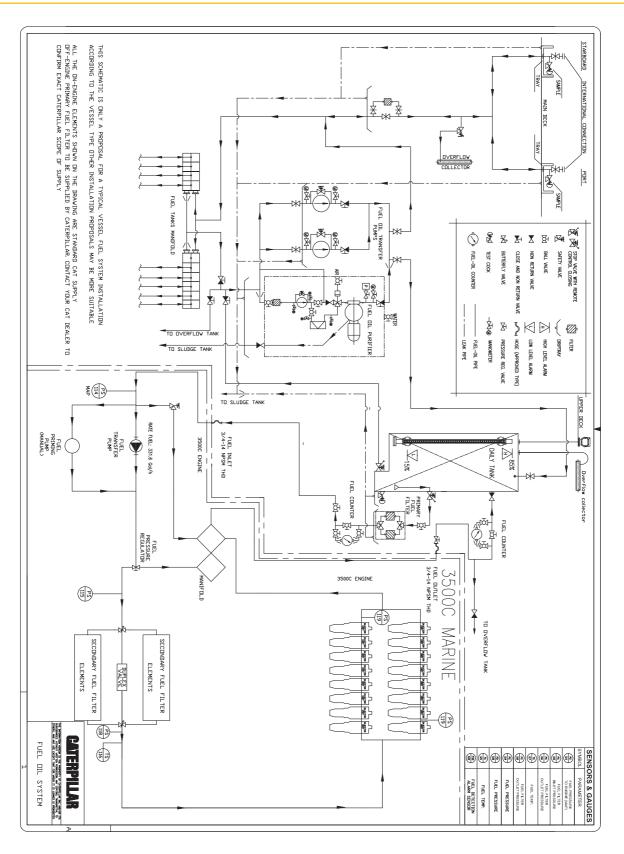
WORLDWIDE FUEL STANDARDS ¹					
Standard	Name	Description			
	ASTM D975	No. 1-D and No. 2-D Diesel Fuel Oils			
American	ASTM D396	No. 1-D and No. 2 Fuel Oils			
	ASTM D2880	No. 1-GT & No. 2-GT Gas Turbine Fuels			
British	BS 2869	Classes A1, A2 and B2 Engine Fuels			
DITUST	BS 2869	Classes C2 and D Burner Fuels			
West	DIN 51601	Diesel Fuel			
German	DIN 51603	Heating Oil EL			
Australian	AS 3570	Automotive Diesel Fuel			
Japanese	JIS K2204	Types 1 (spl), 1, 2, 3, and 3 (spl) Gas Oil			
U.S.	W-F-800C	DF-1, DF-2 Conus and DF-20 Conus Diesel Fuel			
Government	W-F-815C	FS-1 and FS-2 Burner Fuel Oil			
U.S. Military	MIL-L-16884G	G Marine Oil			

¹These fuel standards are usually acceptable, but are subject to change. The distillate fuel chart for acceptable limits should be used as the guide for any fuel whether it's listed in this chart or not (consult Caterpillar A&I for acceptability of any other fuels).

Customer Piping Connections

ENGINE FUEL LINE CONNECTIONS				
Fuel Supply Excess Fuel Return				
3/4"-14 NPSM THD Flange	1/2"-14 NPSM THD Flange			

FUEL OIL SCHEMATIC



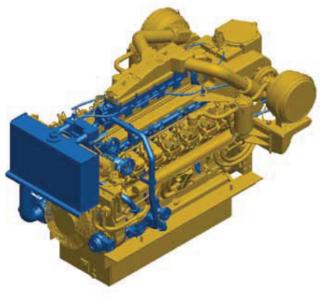
.COOLING SYSTEM

GENERAL

The cooling system configuration for the marine 3500C consists of a jacket water aftercooled system (JWAC) for engine and oil cooling and a separate circuit for turbocharged (charged air) cooling, also known as a SCAC system. So for the 3500C Tier 3 engine the aftercooling system is cooled by mean of two stages – one from the JW pump circuit and another from the SCAC pump circuit – with two passes. This design maintains engine coolant, oil, and intake air at optimum temperatures at all operating conditions.

A titanium-plate heat exchanger is offered as optional, providing a compact, high-efficiency design with low maintenance.

The engine comes from the factory with preservation. The system must be drained and refilled with coolant prior to operation.



INTERNAL COOLING SYSTEM

Fresh Water Pumps

The marine 3500C engine has two gear-driven centrifugal water pumps mounted on-engine. On the front of the engine, the jacket water pump supplies coolant to the oil cooler, block, and heads. The SCAC pump located at the left side of the engine supplies coolant to aftercooler circuit.

A sea water pump is also available as an option at the engine front.

Coolant Temperature Control

The 3500C engine uses fluid inlet sensed, outlet controlled, electronic temperature regulators for uniform coolant temperature to the aftercooler, oil cooler, and cylinder block.

Jacket Water Aftercooled System (JWAC)

Coolant goes into water pump through an elbow. The elbow connects to the radiator or to the heat exchanger. The coolant flow is divided at the outlet of the water pump. Part of the coolant flow is sent to aftercooler and the remainder goes through the engine oil cooler. Coolant that is sent to the aftercooler goes through the aftercooler core. The coolant is sent by an elbow into a passage in cylinder block. The passage is near the center of the vee at the rear of the cylinder block.

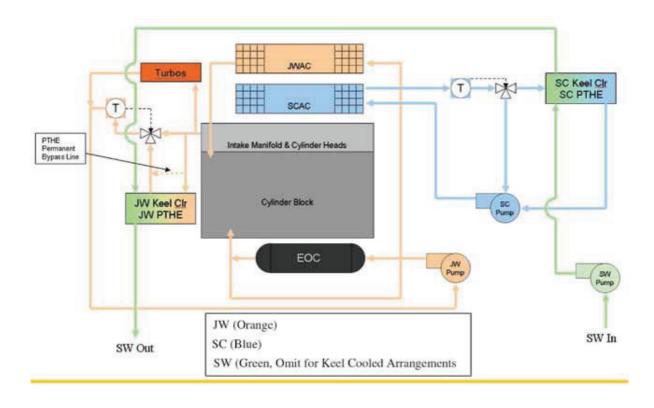
The coolant flows through the engine oil cooler into the water jacket of the cylinder block at the right rear cylinder. The cooler coolant and the hotter coolant are then mixed. The coolant goes to both sides of the cylinder block through distribution manifolds. The distribution manifolds are connected to the water jacket of all the cylinders. The main distribution manifold is located just above the main bearing oil gallery.

The coolant flows upward through the water jackets. The coolant flows around the cylinder liners from the bottom to the top. The hottest temperature is near the top of the cylinder liners. The water jacket is smaller near the top of the cylinder liners. This shelf causes the coolant to flow faster for better liner cooling.

Coolant from the top of the liners goes into the cylinder head. The cylinder head sends the coolant around the hottest parts, then to the top of the cylinder head. The coolant goes out through an elbow at each cylinder head and into the water manifold at each bank of cylinders. Coolant goes through the water manifold to temperature regulator housing.

The water temperature regulator housing has an upper flow section and a lower flow section. The housing uses four temperature regulators. The sensing bulbs of the four temperature regulators are in the lower section of the housing. Before the regulators open, cold coolant is sent through bypass tube back to the inlet of the water pump. As the temperature of the coolant increases and the regulators start to open, the coolant flow in the bypass tube is restricted. Some coolant is sent through the outlets to the radiator or to the heat exchanger.

The total system capacity will depend on the amount of coolant in the following components: cylinder block, radiator, or the heat exchanger and the coolant lines. See the following drawing.



EXTERNAL COOLING SYSTEM

Cooling Methods

The marine 3500C engine can be cooled with off-packagemounted radiators or plate-type heat exchangers. The selected cooling method must provide the required coolant temperature and flow at the SCAC pump inlet to meet the applicable emission requirements. Following is a list of considerations for sizing radiators and heat exchangers.

- Maximum ambient temp
- Maximum cooling water temp
- External cooling water (fresh or sea water)
- Internal cooling water composition (i.e. 50% ethylene glycol)
- Engine performance data (for up-to-date numbers see TMI)

Expansion Tanks

The jacket water circuit and the aftercooler circuit both require an expansion tank. Its primary function is to contain the expansion volume of the coolant as it heats up. The expansion tank size should be at least 15% of the total system volume. This provides for expansion plus reserve. To find out what type of expansion tank your system needs (full flow or partial flow) please see the expansion tank section in the Cooling Systems A&I guide (LEBW4978).

As an option for 3500C marine engines, a shipped loose expansion tank can be included in Caterpillar scope of supply. Specifically the expansion tank supplied by Caterpillar has a maximum capacity of 635 L (167 gal) so it is suitable for use in cooling systems with total volume of 635 liters or less. This expansion tank has already fitted a 14 psi pressure cap to ensure better performance on the cooling system.

CATERPILLAR OFF-ENGINE EXPANSION TANK CAPACITY				
Engine Rated Speed Liters U.S. Gal				
3500C	1600-1800 rpm	635	167	

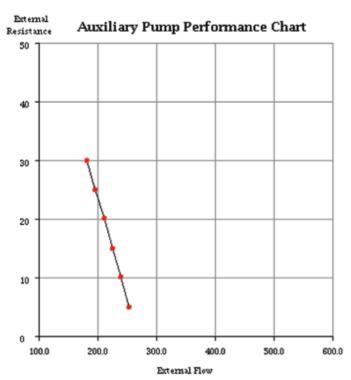
EXTERNAL COOLING SYSTEM DESIGN CONSIDERATIONS

Coolant Flow Control

The external circuit resistance setting establishes the total circuit flow by balancing total circuit losses with the characteristic pump performance curves. Correct external resistance is very important. Excessive high restriction results in reduced coolant flow and system effectiveness. Excessive low restriction may cause high fluid velocity resulting in cavitation/ early component erosion. Following are the pump performance curves at the time of publication. For current data please refer to TMI.

SCAC Pump Performance

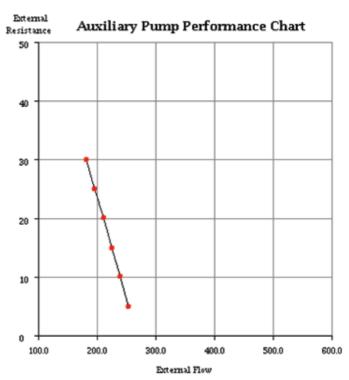
Engine Speed — 1600 rpm (DM8623)



Engine Speed RPM: 1,600 Pump Speed RPM: 2,128

EXT FLOW GPM
254,4
239.87
225.6
211.07
196.\$1
182.28

Engine Speed — 1800 rpm (DM8624)

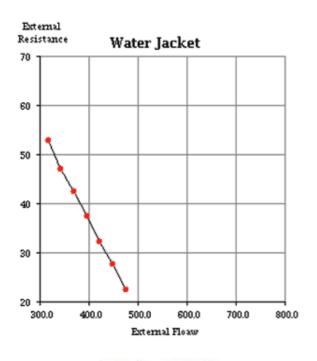


	eed RPM: 1,800 eed RPM: 2,400
EVE	EVT

EXT RESIST FT H20	EXT FLOW GPM		
4.99	251.76		
10.01	240.92		
14.99	229.83		
20.01	219		
25	207.9		
29.99	197.07		

Jacket Water Pump Performance

Engine Speed — 1200 rpm (DM1299)





Jacket Water Heaters

Jacket water heaters may be required to meet cold starting and load acceptance criteria. To provide for the optimum use of the heater, Caterpillar routes the heater water into the top of the cylinder block and to exit at the bottom to maintain block temperature. Caterpillar offers an optional heater for installations.

System Pressures

Correct cooling system pressure minimizes pump cavitation and increases pump efficiency. The combination of static and dynamic pressure heads must meet the pressure criteria listed in the technical data.

Venting

Proper venting is required for all applications. Vent lines should be routed to an expansion tank at a constant upward slope. On the marine 3500C there are two venting locations (3/4 - 16 THD connection); one JW and one AC. The AC only needs venting when filling the system. Please see the installation drawings in this project guide for location.

System Monitoring

During the design and installation phase it is important that provisions are made to measure pressure and temperature differentials across major system components. This allows accurate documentation of the cooling system during the commissioning procedure. Future system problems or component deterioration (such as fouling) are easier to identify if basic data is available.

Serviceability

Suitable access should be provided for cleaning, removal, or replacement of all system components. Isolation valves should be installed as deemed necessary to facilitate such work.

System Pressures and Velocities

The following pressure and velocity limits apply to 3500C series engines:

3500C SERIES ENGINES				
Water Pump Pressures				
Maximum Allowable Static Head	170 kPa(g)			
Minimum SCAC Inlet Pressure (dynamic)	-6 kPa(g)			
Minimum Jacket Water Heater Sizing with Inlet Pressure (dynamic)	-6 kPa(g)			
Maximum Operating Pressures				
Engine Cooling Circuits	300 kPa(g)			
Water Velocities				
Pressurized Lines	4.5 m/s			
Suction Lines (Pump Inlet)	1.5 m/s			
Low Velocity De-aeration Line	0.6 m/s			

Coolant Flow Control

The correct coolant flows are obtained by factory installed orifices on the engine, combined with proper external circuit resistance set at each site during commissioning, either with customer installed orifices or balancing valves, although a lockable plug valve is recommended. The external circuit resistance setting establishes the total circuit flow by balancing total circuit losses with the characteristic pump performance curves. Correct external resistance is very important. Too high a resistance will result in reduced flows to the aftercooler and oil cooler, and their effectiveness will decrease. If there is too low a resistance, the fluid velocity limits may be exceeded, and cavitation/early wear could be the result.

Note: Factory-packaged cooling systems eliminate the need for the customer to set external resistance for engine cooling circuits at site. Proper flow rates for the engine cooling circuits of a factory packaged cooling system are designed by Caterpillar and tested during the factory acceptance test.

COOLING WATER REQUIREMENTS

Water Quality, Rust Inhibitors, and Antifreeze

Maintaining water quality is very important in closed cooling systems. Excessive hardness will cause deposits, fouling, and reduced effectiveness of cooling system components. Caterpillar coolant inhibitor is available to properly condition the cooling water. When using it, the cooling water piping must not be galvanized and aluminum should not be used. If the piping is galvanized, the zinc will react with the coolant inhibitor and form clogs, which will interfere with the system operation.

3500C EPA Tier 3 Glycol Percentage

All new 3500C Marine EPA Tier 3 capable engines will be required to use a maximum concentration of 20% glycol mixture in the aftercooler circuit. This restriction applies equally to both heat exchanger cooled and keel cooled configurations (box coolers). In the event that specific project needs require higher levels of freeze protection, (lower freeze temperature), please contact ASC to review the specific engine rating and glycol concentration desired.

The jacket water circuit will continue to be capable of operation up to 50%.

CUSTOMER PIPING CONNECTIONS

Engine Connections	5
Engine Cooling Water Inlet/Outlet	
AC Cooling Water Inlet	See GA schematics within this guide
AC Cooling Water Outlet	

Types of Coolers

Caterpillar marine engines use one or two cooling water circuits depending on the cooling systems configuration. A separate circuit engine operates with two independent cooling circuits. One is used to cool the lube oil and engine jackets and the other is used to cool the aftercooler water. A combined cooling system links the engine's pipe work so that there is only one inlet and outlet on the engine. A combined cooling system offers less pipe work and is more economical, as it requires only one heat exchanger.

Cooling of transmission oil can be achieved by using the jacket water, aftercooler water, or a separate cooling circuit depending on the transmission model and/or the engine cooling arrangements.

Three different coolers are available to be used with the engines depending on the vessel/system requirements.

Heat Exchanger (Caterpillar Supply)

Heat exchanger cooling for jacket water can be mounted either on the engine or remote from the engine. Engine-mounted heat exchangers require the least amount of off-engine pipe work fitting since the factory provides the jacket water connections to the heat exchanger.

Remote-mounted heat exchangers require connections between the jacket water inlet and outlet of the engine to the shell side of the exchanger. An engine-driven sea water pump is used to circulate the sea water through the heat exchanger/s.

Caterpillar supplies engine-mounted heat exchangers and Cat dealers are able to supply any heat exchangers that are to be positioned off the engine.

Keel Cooler (Yard Supply)

In most cases the yard will supply the keel cooler. As the keel cooler sizing and arrangement will be different for every build, once the engine order has been placed the Cat dealer will inform the yard of the pump flows and heat rejection data so the yard is able to size the keel cooler correctly.

The keel cooler is an outboard heat exchanger that is either attached to the submerged part of a vessel's hull or built as a part of it. Jacket water/aftercooler water is circulated through the coolers by the engine-driven pumps.

Note: If a keel cooler is to be used, the sea water pump can be removed from the main price.

Keel Conversion (Caterpillar Supply)

If the customer intends to use a keel cooler with the engine, Caterpillar is able to supply the engine to the customer with the connections required for a keel conversion.

Radiators (Optional Cat Dealer Supply)

Radiator cooling is available for these engines. Caterpillar will supply the engine with all the required fittings except the radiator. The radiators can be purchased via Caterpillar or Cat dealer. In most cases the radiators are specified from Caterpillar with the engine build; however, if required, the Cat dealer is able to supply a radiator to suit an engine installation.

It is possible to mount the radiators remote to the engine; however, if this is the case, the cooling system layout would need to be reviewed to ensure the engine is still going to be cooled sufficiently in the way it was designed to be cooled.

Please Note: It is important to discuss with customer/yard if they wish to cool other circuits with the supplied heat exchanger. The engines are often coupled to gearboxes and it is possible in some cases to provide cooling for the gearboxes via the engine. This can usually be done where the heat exchanger is mounted off the engine. The heat rejection figures would need to be obtained from the gearbox suppliers to correctly size the heat exchanger.

SEA WATER SYSTEM

COMBINED CIRCUIT SYSTEM (SEPARATE CIRCUIT OFF-ENGINE HEAT EXCHANGERS)

On a separate system the sea water is used to cool the fuel returning from the engine, aftercooler water and the jacket water.

Engine-Driven Sea Water Pump

The sea water pump draws water from the vessel's existing sea chest to the engine-driven sea water pump. After the pump, the water goes through the fuel cooler, then to the aftercooler heat exchanger, and then through the jacket water heat exchanger.

Fuel Cooler (See Fuel System)

The fuel returning from the engine is cooled prior to entering the day tank. This is done to maintain a fuel temperature to the engine of below 66°C to prevent damage being done to the injectors.

Aftercooler Heat Exchanger (Optional Caterpillar Supply)

The cooling sea water passes from the fuel cooler to the aftercooler heat exchanger. The aftercooler heat exchanger cools the combustion air after it leaves the turbocharger and before it enter the combustion spaces.

Jacket Water Heat Exchanger (Optional Caterpillar Supply)

The sea water then passes through to the jacket water heat exchanger, before it is sent overboard.

Emergency Operation – Class Requirement

There is a specific requirement of some classification societies relating to seagoing propulsion engine applications. The purpose is to ensure sea water pressure and circulation if the enginedriven sea water pump fails.

Emergency Connections – Class Requirement (Optional Cat Dealer Supply)

Cat dealers can supply the connections required for emergency operation of the sea water systems. In some cases the shipyard might want to carry out these modifications.

Emergency Pump – Class Requirement (Optional Cat Dealer Supply)

Cat dealers can supply an emergency electric pump required to maintain the sea water pressure and circulation should the engine-driven pump fail.

COMBINED CIRCUIT SYSTEM (SINGLE OFF- OR ON-ENGINE HEAT EXCHANGERS)

Where a combined cooling water system is used, the sea water passes through one heat exchanger. This is known as a jacket water aftercooled system. The heat exchanger cools the jacket water that in turn cools the rest of the engine systems.

Please Note: If the engine is supplied to class, coolers need to be sized for 32°C sea water inlet temperature.

Engine-driven Sea Water Pump

The sea water pump draws water from the vessel's existing sea chest to the engine-driven sea water pump. After the pump the water goes through the jacket/aftercooler water heat exchanger.

Heat Exchanger (Optional Caterpiller Supply)

On a combined circuit the sea water/raw water heat exchanger is used to cool the water that is flowing through both the heat exchanger and aftercooler heat exchanger. As previously stated, this can be supplied on or off the engine.

Emergency Operation – Class Requirement

There is a specific requirement of some classification societies for emergency operation of sea water pumps for single propulsion engine applications. The purpose is to ensure sea water pressure and circulation if the engine-driven sea water pump fails.

Emergency Connections – Class Requirement (Optional Cat Dealer Supply)

Cat dealers can supply the emergency connections required for emergency operation of the sea water system. In some cases the shipyard might want to carry out these modifications.

Emergency Pump – Class Requirement (Optional Cat Dealer Supply)

Cat dealers can supply an emergency electric pump required to maintain the sea water pressure and circulation should the engine-driven pump fail.

COOLING SYSTEM

COMBINED COOLING WATER SYSTEM

Remote Off-engine Heat Exchanger

This system is referred to a Jacket Water Aftercooled (JWAC) system in Caterpillar literature and publications.

The combined system provides cooling for both the jacket water circuits and the aftercooler circuits. This system is derived from converting a engine that has been built by Caterpillar as a separate circuit system to a combined system.

The advantage of using a system such as this is that it only requires one raw/sea water heat exchanger and there are fewer system connections.

Engine-driven Jacket Water Pump

The jacket water pump is engine-mounted and delivers the coolant through the lubricating oil cooler and then to the engine block. From the engine it enters a temperature regulator. From the temperature regulator the coolant is either diverted back through the system to the pump suction or through the heat exchanger.

Lubricating Oil Cooler

The jacket water coolant flows through the oil cooler. The jacket water coolant is supplied to a cooler at a pressure that is lower than that of the lubricating oil.

Engine-driven Aftercooler Water Pump

The aftercooler water pump passes the coolant through the aftercooler to cool the air before it enters a thermostatic valve. From the thermostatic valve the coolant is either diverted back through the system to the pump suction or through the heat exchanger.

Aftercooler

Some of the jacket water coolant flows through the aftercooler to cool the air before it enters the cylinders. It is desirable to maintain an inlet manifold temperature between 30°C and 52°C.

Thermostatic Temperature Regulating Valves

When the coolant is cold, the regulator bypasses the heat exchanger until it gets up to temperature. When the coolant starts to get up to temperature the regulator opens and allows more coolant to pass through the cooler.

Heat Exchanger (Caterpillar Supply)

The coolant passes through the sea water-cooled heat exchanger when it gets up to temperature.

Flexible Connectors (Optional Cat Dealer Supply)

The customer-supplied coolant piping must be attached to the engine via flexible hoses, which can be supplied by Cat dealers. The positions of the flexible connections and shutoff valves are important so that if there is a broken flexible connection it can be isolated without shutting down the whole system.

Emergency Operation – Class Requirement

This is a specific requirement of some classification societies for seagoing single propulsion engine applications. The purpose is to ensure jacket water pressure and circulation if the engine-driven lube jacket water or aftercooler pump fails.

Emergency Connections – Class Requirement (Optional Caterpillar Supply)

Caterpillar can supply the emergency connections required for the jacket water system. Cat dealers can provide the emergency connections for the aftercooler and sea water circuits.

Emergency Pumps – Class Requirement (Optional Cat Dealer Supply)

Cat dealers can supply the emergency pump required to maintain the jacket water, aftercooler water, and sea water pressure and circulation should any of the engine-driven pumps fail.

SEPARATE COOLING WATER SYSTEM

This system uses two separate circuits that operate independently to provide cooling to the engine.

JACKET WATER CIRCUIT – OFF-ENGINE HEAT EXCHANGER

Engine-mounted Jacket Water Pump

The jacket water pump is engine-mounted and delivers the coolant to the lubricating oil cooler and to then to the engine block, cylinder heads, etc.

Lubricating Oil Cooler

The jacket water coolant flows through the oil cooler. The jacket water coolant is supplied to the cooler at a pressure that is lower than that of the lubricating oil.

Temperature Regulator

When the coolant is cold, the regulator bypasses the heat exchanger until it gets up to temperature. When the coolant starts to get up to temperature the regulator opens to allow more coolant to pass through the cooler.

Heat Exchanger (Optional Cat Dealer Supply)

The aftercooler circuit water passes through the heat exchanger when it gets up to temperature. The size of the additional aftercooler heat exchanger will depend on the engine size and rated horsepower.

Emergency Operation – Class Requirement

This is a specific requirement of some classification societies for seagoing single propulsion engine applications. The purpose is to ensure jacket water pressure and circulation if the engine-driven lube jacket water pump fails.

This is subject to change and will depend on the engine application and installation arrangements onboard the vessel.

Emergency Connections – Class Requirement (Optional Caterpillar Supply)

Caterpillar can supply the connections required for emergency operation of the emergency jacket water pump.

Emergency Pump – Class Requirement (Optional Cat Dealer Supply)

Cat dealers can supply the emergency pump required to maintain the jacket water pressure and circulation should the enginedriven pump fail.

AFTERCOOLER WATER CIRCUIT (SCAC – SEPARATE CIRCUIT AFTERCOOLED WITH OFF-ENGINE HEAT EXCHANGER)

Aftercooler Water Pump

The aftercooler water pump passes the coolant through a separate cooler that cools the air before it enters the cylinder liners. Caterpillar supplies the engine-driven pump.

Aftercooler

The aftercooler cools the air that exits from the turbochargers before it enters the air inlet manifold so the engine can achieve complete and efficient combustion.

Thermostatic Housing

When the coolant is cold, the regulator bypasses the heat exchanger until it gets up to temperature. When the coolant starts to get up to temperature, the regulator opens and allows more coolant to pass through the cooler.

Heat Exchanger (Caterpillar Supply)

The aftercooler circuit water passes through the heat exchanger when it gets up to temperature. The size of the aftercooler heat exchanger will depend on the engine size and rated horsepower. This is mounted off the engine. This system requires an additional Cat dealer or customer-supplied expansion tank.

Flexible Connectors (Optional Cat Dealer Supply)

The customer-supplied coolant piping must be attached to the engine via flexible hoses, which can be supplied by Cat dealers. The positions of the flexible connections and shutoff valves are important so that if there is a broken flexible connection it can be isolated without shutting down the whole system.

Emergency Operation – Class Requirement

This is a specific requirement of some classification societies for seagoing single propulsion engine applications. The purpose is to ensure jacket water pressure and circulation if the engine-driven lube aftercooler water pump fails.

Emergency Connections – Class Requirement (Optional Cat Dealer Supply)

Cat dealers can supply the connections required for emergency operation of an emergency aftercooler pump.

Emergency Pump – Class Requirement (Optional Cat Dealer Supply)

Cat dealers can supply the emergency pump required to maintain the aftercooler water pressure and circulation should the engine-driven pump fail.

AFTERCOOLER WATER CIRCUIT (SWAC – SEA WATER AFTERCOOLED)

Aftercooler Water Pump

The aftercooler water pump passes sea water through a separate cooler that cools the air before it enters the cylinder liners. Caterpillar supplies the engine-driven pump.

Aftercooler

The aftercooler cools the air that exits from the turbochargers before it enters the air inlet manifold so the engine can achieve complete and efficient combustion.

Thermostatic Housing

When the coolant is cold, the regulator bypasses the heat exchanger until it gets up to temperature. When the coolant starts to get up to temperature the regulator opens and allows more coolant to pass through the cooler.

Flexible Connectors (Optional Cat Dealer Supply)

The customer-supplied coolant piping must be attached to the engine via flexible hoses, which can be supplied by Cat dealers. The positions of the flexible connections and shutoff valves are important so that if there is a broken flexible connection it can be isolated without shutting down the whole system.

Emergency Operation – Class Requirement

This is a specific requirement of some classification societies for seagoing single propulsion engine applications. The purpose is to ensure jacket water pressure and circulation if the engine-driven lube aftercooler water pump fails.

Emergency Connections – Class Requirement (Optional Cat Dealer Supply)

Cat dealers can supply the connections required for emergency operation of an emergency aftercooler pump.

Emergency Pump – Class Requirement (Optional Cat Dealer Supply)

Cat dealers can supply the emergency pump required to maintain the aftercooler water pressure and circulation should the engine-driven pump fail.

COMBINED COOLING WATER SYSTEM – ON-ENGINE HEAT EXCHANGER

Important Note: This combined cooling system with enginemounted heat exchanger is available for 3500 series engines up to 2682 bhp. This heat exchanger incorporates a diesel fuel oil cooler as well. Above this engine power the heat load of the engine becomes too excessive for the heat exchanger. This system can be purchased direct off the current price lists.

This system is referred to a JWAC – jacket water aftercooled system in Caterpillar literature and publications.

The combined system provides cooling for both the jacket water circuits and the aftercooler circuits. The advantage of this system is that there are only two cooling water connections to be made with the engine: sea water in and sea water out. This compact installation is ideal where space is at a premium.

Engine-driven Jacket Water Pump

The jacket water pump is engine-mounted and delivers the coolant through the lubricating oil cooler and then to the engine block. From the engine it enters a temperature regulator. From the temperature regulator the coolant is either diverted back through the system to the pump suction or through the heat exchanger.

Lubricating Oil Cooler

The jacket water coolant flows through the oil cooler. The jacket water coolant is supplied to a cooler at a pressure that is lower than that of the lubricating oil.

Engine-driven Aftercooler Water Pump

The aftercooler water pump passes the coolant through the aftercooler to cool the air before it enters a thermostatic valve. From the thermostatic valve the coolant is either diverted back through the system to the pump suction or through the heat exchanger.

Aftercooler

Some of the jacket water coolant flows through the aftercooler to cool the air before it enters the cylinders. It is desirable to maintain an inlet manifold temperature between 30°C and 52°C.

Thermostatic Temperature Regulating Valves

When the coolant is cold, the regulator bypasses the heat exchanger until it gets up to temperature. When the coolant starts to get up to temperature, the regulator opens and allows more coolant to pass through the engine-mounted heat exchanger.

Heat Exchanger (Caterpillar Supplied)

The coolant passes through the engine-mounted sea watercooled heat exchanger when it gets up to temperature. This cooler also incorporates a diesel fuel oil cooler that is used to monitor the temperature of the fuel.

Flexible Connectors (Optional Cat Dealer Supply)

The customer-supplied coolant piping must be attached to the engine via flexible hoses, which can be supplied by your Cat dealer. The positions of the flexible connections and shutoff valves are important so that if there is a broken flexible connection it can be isolated without shutting down the whole system.

Emergency Operation – Class Requirement

This is a specific requirement of some classification societies for seagoing single propulsion engine applications. The purpose is to ensure jacket water pressure and circulation if the engine-driven jacket water or aftercooler pump fails.

Emergency Connections – Class Requirement (Optional Caterpillar Supply)

Caterpillar can supply the emergency connections required for the jacket water system. Cat dealers can provide the emergency connections for the aftercooler and sea water circuits.

Emergency Pumps – Class Requirement (Optional Cat Dealer Supply)

Cat dealers can supply the emergency pump required to maintain the jacket water, aftercooler water, and sea water pressure and circulation should any of the engine-driven pumps fail.

DUAL COOLING WATER CIRCUIT – ON ENGINE HEAT EXCHANGER

Important Note: This separate cooling system with enginemounted heat exchanger is available for 3500 series engines with powers up to 2682 bhp. This heat exchanger does not incorporate a diesel fuel oil cooler so a separate cooler will be required. Above this engine power the heat load of the engine becomes too excessive for the heat exchanger. This system can be purchased from Caterpillar; however, as this is not currently available off the standard price list, a design will need to be requested from the factory at an additional cost. This might increase the lead time of the engine.

This system is referred to as a Separate Circuit Aftercooled (SCAC) system in Caterpillar literature and publications.

The dual circuit system provides cooling for both the jacket water circuits and the aftercooler circuits. The advantage of this system is that there are only two cooling water connections to be made with the engine: sea water in and sea water out. This compact arrangement is ideal where space is at a premium.

Engine-driven Jacket Water Pump

The jacket water pump is engine-mounted and delivers the coolant through the lubricating oil cooler and then to the engine block. From the engine it enters a temperature regulator. From the temperature regulator the coolant is either diverted back through the system to the pump suction or through the heat exchanger.

Lubricating Oil Cooler

The jacket water coolant flows through the oil cooler. The jacket water coolant is supplied to a cooler at a pressure that is lower than that of the lubricating oil.

Engine-driven Aftercooler Water Pump

The aftercooler water pump passes the coolant through the aftercooler to cool the air before it enters a thermostatic valve. From the thermostatic valve the coolant is either diverted back through the system to the pump suction or through the heat exchanger.

Aftercooler

Some of the jacket water coolant flows through the aftercooler to cool the air before it enters the cylinders. It is desirable to maintain an inlet manifold temperature between 30°C and 52°C.

Please Note: This system requires an additional Cat dealer or customer supplied expansion tank.

Thermostatic Temperature Regulating Valves

When the coolant is cold, the regulator bypasses the heat exchanger until it gets up to temperature. When the coolant starts to get up to temperature, the regulator opens and allows more coolant to pass through the engine-mounted heat exchanger.

Heat Exchanger (Caterpillar Supplied)

The coolant passes through the engine-mounted sea watercooled heat exchanger when it gets up to temperature.

Flexible Connectors (Optional Cat Dealer Supply)

The customer-supplied coolant piping must be attached to the engine via flexible hoses, which can be supplied by Cat dealers. The positions of the flexible connections and shutoff valves are important so that if there is a broken flexible connection it can be isolated without shutting down the whole system.

Emergency Operation – Class Requirement

This is a specific requirement of some classification societies for seagoing single propulsion engine applications. The purpose is to ensure jacket water pressure and circulation if the engine-driven jacket water or aftercooler pump fails.

Emergency Connections – Class Requirement (Optional Caterpillar Supply)

Caterpillar can supply the emergency connections required for the jacket water system. Cat dealers can provide the emergency connections for the aftercooler and sea water circuits.

Emergency Pumps – Class Requirement (Optional Cat Dealer Supply)

Cat dealers can supply the emergency pump required to maintain the jacket water, aftercooler water, and sea water pressure and circulation should any of the engine-driven pumps fail.

SINGLE COOLING WATER SYSTEM – ON-ENGINE HEAT EXCHANGER

Important Note: This single cooling system with engine-mounted heat exchanger is available for 3500 series engines with power up to 3386 bhp. This heat exchanger is used to cool the jacket water only. The aftercooler can be cooled by a separate heat exchanger or sea water and a separate heat exchanger is required for the fuel oil. Above this engine power the heat load of the engine becomes too excessive for the heat exchanger. This system can be purchased from Caterpillar; however, as this is not currently available off the standard price list, a design will need to be requested from the factory at an additional cost. This might increase the lead time of the engine.

This system is referred to as a Jacket Water Aftercooled (JWAC) system in Caterpillar literature and publications.

The single system provides cooling for the jacket water circuits only. This compact arrangement is ideal where space is at a premium.

Engine-driven Jacket Water Pump

The jacket water pump is engine-mounted and delivers the coolant through the lubricating oil cooler and then to the engine block. From the engine it enters a temperature regulator. From the temperature regulator the coolant is either diverted back through the system to the pump suction or through the heat exchanger.

Lubricating Oil Cooler

The jacket water coolant flows through the oil cooler. The jacket water coolant is supplied to a cooler at a pressure that is lower than that of the lubricating oil.

Thermostatic Temperature Regulating Valves

When the coolant is cold, the regulator bypasses the heat exchanger until it gets up to temperature. When the coolant starts to get up to temperature the regulator opens and allows more coolant to pass through the engine-mounted heat exchanger.

Heat Exchanger (Caterpillar Supplied)

The coolant passes through the engine-mounted sea watercooled heat exchanger when it gets up to temperature. This cooler also incorporates a diesel fuel oil cooler that is used to monitor the temperature of the fuel.

Flexible Connectors (Optional Cat Dealer Supply)

The customer-supplied coolant piping must be attached to the engine via flexible hoses, which can be supplied by your Cat dealer. The positions of the flexible connections and shutoff valves are important so that if there is a broken flexible connection it can be isolated without shutting down the whole system.

Emergency Operation – Class Requirement

This is a specific requirement of some classification societies for seagoing single propulsion engine applications. The purpose is to ensure jacket water pressure and circulation if the engine-driven jacket water pump fails.

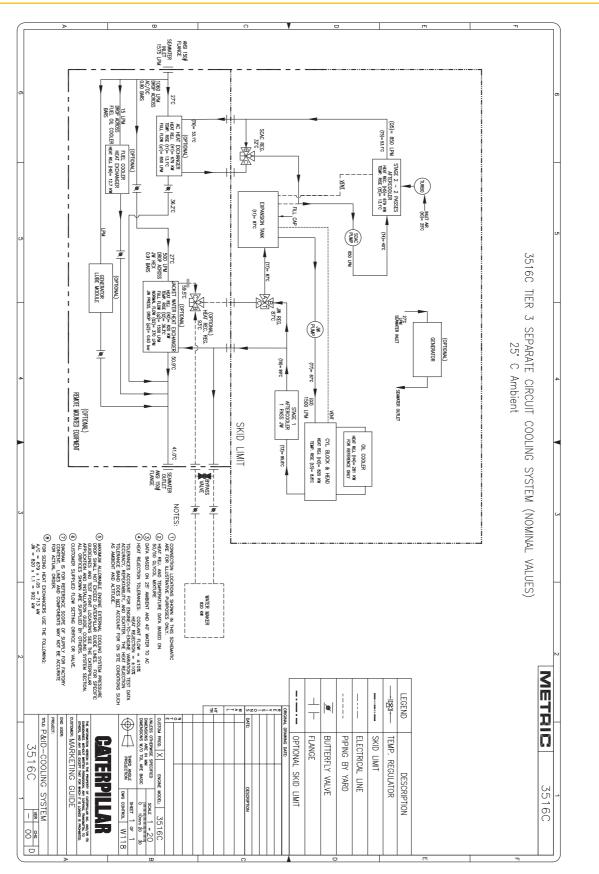
Emergency Connections – Class Requirement (Optional Caterpillar Supply)

Caterpillar can supply the emergency connections required for the jacket water system. Cat dealers can provide the emergency connections for the sea water circuits.

Emergency Pumps – Class Requirement (Optional Cat Dealer Supply)

Cat dealers can supply the emergency pump required to maintain the jacket water and sea water pressure and circulation should any of the engine-driven pumps fail.

COOLING SYSTEM SCHEMATIC



STARTING AIR SYSTEM

GENERAL

The 3500C marine engine starting system consists of dual electric starters or a turbine air starter, according to required specifications.

The starting requirements of the engine can be altered to suit the customer's requirements and what the customer has available to them. It is also important that if the engine is being built to class that the classification society's requirements are taken into account.

Electrical Starting Systems

Use chemical energy stored in batteries, automatically recharged by an engine-driven alternator or by an external source.

Air or Pneumatic Starting

Uses compressed air in pressure vessels, automatically recharged by an electric motor-driven air compressor.

Hydraulic Starting System

An additional starting system that uses hydraulic oil stored in steel pressure vessels under high pressure, automatically recharged by a small engine-driven hydraulic pump with integral pressure relief valve.

ELECTRICAL STARTING SYSTEM

Battery powered, electric motors use low voltage direct current and provide fast, convenient, pushbutton starting with lightweight compact engine components.

Electrical Starting Motor

Unless otherwise specified, the engine will be supplied from Caterpillar with an electric start motor.

Batteries

Where the main engine is arranged for electric starting, two or four separate batteries are to be fitted. The batteries cannot be connected in parallel. Each battery must be capable of starting the main engine when the engine is cold and in ready-to-start condition.

The starting batteries are to be used for starting and the engine's own monitoring purposes only. Stored energy must be continuously maintained. The batteries should be located as close as possible to the starter and the battery cables should be suitably supported at intervals along their length.

It is a class requirement that the batteries combined capacity is able to provide, without recharge, a number of starts as specified by the classification societies. Further information relating to the requirements of classification societies will follow. The size of the batteries will depend on the ambient air temperature where the engine is going to operate and the type of starter fitted.

Battery Charger (Optional Caterpillar Supply)

If the engine is going to be left idle for periods, it will be necessary to keep the batteries are kept fully charged and in the ready-to-use state. Caterpillar is able to supply a 10-amp battery charger that has automatic switching from equalize to float.

Sizing

The ambient air temperatures in the engine's working environment must be taken into account, as this will affect the number of batteries required to start the engine.

Note: If lead acid batteries are used, give special consideration to where the batteries are located, as hydrogen gas is given off the batteries when they are charged. The hydrogen gas is very flammable and compartments containing lead acid batteries must be suitably vented.

Lower ambient temperatures drastically affect battery performance and charging efficiencies.

When operating in cold climates, heaters should be used to maintain a battery temperature of between $32^{\circ}C$ and $52^{\circ}C$ ($90^{\circ}F$ to $125^{\circ}F$).

Five different sizes of starters are available from Caterpillar depending on the engine arrangement and layout. These draw up to a maximum of 140 amps @ 23 volts. Your Cat dealer will advise regarding the required starting current once the engine build has been specified.

Class Requirement

Where the engine has been built to class with an electric start motor, it will be important that they are sized correctly to meet the requirements of class. It is a requirement of classification societies that the total combined capacity of the batteries is sufficient to provide, without being recharged, a minimum of six consecutive starts of each main non-reversing engine connected to a controllable pitch propeller or other device enabling the start, without opposite torque, within a half-hour period.

Regardless of above, for multi-engine installations the number of starts required for each engine may be reduced upon agreement with the classification society depending upon the arrangement of the engines and transmission of the output propellers.

AIR START MOTOR (OPTIONAL CATERPILLAR SUPPLY)

Cat engines can be supplied with an air start motor if required. Air starting of the engines is highly reliable. The torque available from air start motors is able to accelerate the engine to twice the cranking speed in about half the time required by electric starters.

Pipe Work (Yard Supply)

The air starter supply pipe work should be as short and direct as and at least equal to the pipe air start motor intake. Black iron piping is preferred.

Compressors (Yard Supply)

Where the main engine is arranged for starting by compressed air, two or more compressors are to be fitted. At least one of the compressors is to be driven independent of the main propulsion unit and is to have the capacity of not less than 50 percent of the total required.

The total capacity of the air receivers is to be sufficient to supply, within one hour, the quantity of air needed to satisfy the minimum number of starts as specified by classification societies.

Sizing of Air Storage Tanks (Optional Cat Dealer Supply)

Many applications require the sizing of air storage tanks to provide a specified number of starts without recharging. In certain cases other consumers with high air consumption will need to be taken in to account when sizing the air receiver, especially if the engine is being built to class.

Where the main engines are arranged for starting by compressed air, at least two starting air receivers of about equal capacity are to be fitted and may be used independently. The total capacity of the air receiver is to be sufficient to provide, without being replenished, not less than six consecutive starts.

Cat dealers are also able to supply air receivers to be used in multiple engine installations. The size of the air receivers will depend of the engine type and installation arrangement.

Class Requirements

Where the engine has been built to class with an air start motor, the air receiver must be sized correctly to meet the requirements of class. It is a requirement of classification societies that the total capacity of the air receivers is sufficient to provide, without being replenished, a minimum of six consecutive starts of each main non-reversing engine connected to a controllable pitch propeller or other device enabling the start without opposite torque, within one hour.

Regardless of above, for multi-engine installations the number of starts required for each engine may be reduced upon agreement with the classification society depending upon the arrangement of the engines and transmission of the output propellers.

Moisture Traps (Caterpillar Supply)

It is important that either a manual or automatic fluid trap is positioned between the airline and the engine in the lowest part of the pipe work to ensure that water or oil is able to reach the starter motor. It is important that oil and water are removed from the air prior to the air reaching the starter motor to prevent damage being done to the starter. Caterpillar supplies a moisture trap when the an air starter is to be fitted to the engine.

Flexible Connection (Optional Caterpillar Supply)

The customer-supplied air piping must be attached to the engine via flexible hoses, which can be supplied by your Cat dealer. The positions of the flexible connections and shutoff valves are important so that if there is a broken flexible connection it can be isolated without shutting down the whole system.

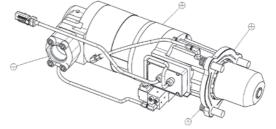
Turbine Starter (Optional Caterpillar Supply)

The standard turbine starter operates on air inlet pressures from 275 to 1034 kPa (40 to 150 psi). These pressures are required at the starter inlet port. An air tank pressure below 415 kPa will not start the engine because of pressure drop associated with the air supply lines. For initial system evaluation, assume a 200 kPa (29 psi) pressure drop between the tank and the air starter inlet.

A pressure regulator is necessary when the supply pressure at the starter exceeds 1034 kPa (150 psi). The quantity of air required for each start and the size of the air receiver depend upon cranking time and air-starter consumption.

The 3500C air starter consumption is:

- 15.8 m³/min @ 414 kPa (559 scfm @ 60 psi)
- 22.3 m³/min @ 620 kPa (787 scfm @ 90 psi)
- 28.7 m³/min @ 414 kPa (1014 scfm @ 120 psi)
- 35.2 m³/min @ 620 kPa (1242 scfm @ 150 psi)



Turbine Air Starter for 3500C Marine Engine

External Starting Air System Design Considerations

The starting air receiver size is normally determined by the requirements of the classification society for the number of starts or start attempts. The size of the air receivers should be increased if the starting air receiver also supplies air for purposes other than the main engine starting (e.g. engine air prelube, work air, auxiliary generator sets).

Engine Piping Connections

The 3500C turbine type starters must be supplied with clean air. Deposits of oil-water mixture must be removed by traps installed in the lines. Lines should slope toward the traps and away from the engine. The air supply pipes should be short with the number of elbows kept to a minimum and at least equal in size to the engine inlet connection, which is 1-1/2" NPTF. A strainer can be provided under request. Although this turbine air staring system normally does not require an air strainer, it is recommended to use #40 mesh Y-strainer in a dirty environment.

Turbine air starters are sensitive to air flow restrictions. The performance of the turbine air starting system will be significantly degraded if air supply lines are not sized properly. 157

STARTING AIR SYSTEM DESIGN CONSIDERATIONS

Pneumatic Starting (Air)

Air starting, either manual or automatic, is highly reliable. Torque available from air motors accelerates the engine to twice the cranking speed in about half the time required by electric starters.

The air system can be quickly recharged; but air storage tanks are prone to condensation problems and must be protected against internal corrosion and freezing.

For the marine 3500C, the air starting motor is designed at max power with 1034 kPa of pressure (150 psi), consuming $0.59 \frac{m^3}{s}$ (20.8 $\frac{ft^3}{s}$) of air.

Air Tank Sizing

Air tanks are required to meet specific characteristics, such as the specifications of the American Society of Mechanical Engineers (ASME). Compressed air storage tanks must be equipped with a maximum pressure valve and a pressure gauge. Check the maximum pressure valve and pressure gauge often to confirm proper operation.

A drain cock must be provided in the lowest part of the air receiver tank for draining condensation.

Marine applications require sizing air storage tanks to provide a specified number of starts without recharging.

This is accomplished using the following formula:

$$V_{T} = \frac{V_{S} \times T \times P_{A}}{P1 - P_{MIN}}$$

Where:

 V_T = Air storage tank capacity (cubic feet or cubic meters) V_s = Air consumption of the starter motor ($\frac{ft^3}{s}$ or $\frac{m^3}{s}$)

If any other air supply is used for other than main engine starting (e.g., work air, auxiliary generator sets starting, etc.) its consumption must be added to V_s also.

T = Total cranking time required (seconds); If six consecutive starts are required, use seven seconds for first start (while engine is cold), and two seconds each for remaining five starts, or a total cranking time of seventeen seconds.

This cranking time is for bare engine only. If there is any additional load, the cranking time should be adjusted accordingly.

- P_A = Atmospheric pressure (psi or kPa): Normally, atmospheric pressure is 101 kPa (14.7 psi)
- P_T = Air storage tank pressure (psi or kPa): This is the storage tank pressure at the start of cranking
- P_{MIN} = Minimum air storage tank pressure required to sustain cranking at 120 rpm (psi or kPa)

Example:

Maximum air tank pressure = 1379 kPag (200 psig)

Minimum air-to-starter pressure = 1034 kPag (150 psig)

Expected air line pressure drop = 207 kPag (30 psig)

Six consecutive starts. First start = 7 seconds; the other 5 starts = 2 seconds

Average barometric pressure = 100 kPa (14.5 psi)

 $(cfm \ x \ 0.02832 = m^3/min)$

Solution:

$$V_{s} = 0.59 \frac{\text{m}^{3}}{\text{s}} (20.8 \frac{\text{L}^{2}}{\text{s}})$$

T = 7 + (5 x 2) = 17 sec
$$P_{A} = 100 \text{ kPa (14.5 psi)}$$
$$P_{T} = 1379 - 207 = 1172 \text{ kPag}$$
$$(200 - 30 = 170 \text{ psig})$$
$$P_{\text{MIN}} = 1034 \text{ kPag (150 psig)}$$

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$$V_{T} = \frac{0.59 \times 17 \times 100}{1172 - 1034} = 7.26 \text{ m}^{3}$$

$$V_{T} = \frac{20.8 \times 17 \times 14.5}{170 - 150} = 256 \text{ ft}^{3}$$

Cranking Time Required

The cranking time for a 3500C depends on ambient air temperature, oil viscosity, and fuel type. Five to seven seconds is typical for a 3500C at 26.7°C (80°F). Restarting hot engines usually requires less than two seconds. Most marine societies require a minimum of six consecutive starts for propulsion engines. Refer to the applicable marine society rules for current requirements for propulsion and other applications on marine vessels.

AIR SUPPLY LINE SIZING

TDI turbine starters must be supplied with clean, dry air. Deposits of oil-water mixture must be removed by traps installed in the lines. Lines should slope toward the traps and away from the engine. Air supply lines should be routed and sized to ensure adequate pressure and flow at the starter(s). As a general rule of thumb, the air supply pipes should be short with number of elbows kept to a minimum to reduce pressure loss to the starter.

For simple starting motor systems the customer connection is either 1-1/2 inch or 2-inch NPT. 2-inch supply line size is minimum required and a customer-provided 3-inch supply air line is recommended for installations with more than 50 ft (15 m) of equivalent straight length of pipe from receiver or regulator to air starter.

A flexible connection between engine starting line and supply line should always be used to prevent vibration-induced fatigue. If a pressure reducing valve is required, a valve with Cv40 should be used to provide sufficient air flow. Locate the pressure reducing valve as close to the engine as possible to minimize the air pressure reduction valve supply pipe diameter. Water and oil must be removed frequently to prevent possible damage to the motor and pipes.

HYDRAULIC STARTING

Hydraulic starting provides high cranking speeds and fast starts. It is relatively compact and recharging time using a small enginedriven recharging pump is fast. A hand pump is provided for this purpose; although hand recharging is very laborious, it can be used to recharge this system.

The high pressure of the system requires special pipes and fittings to be used throughout. Because of the high pressures involved (typically 3000 psi [20,700 kPa] when fully charged) recharging the accumulator requires special equipment.

Hydraulic starting is sometimes selected when the engine is being used as an emergency generator or when the use of electrical connections could pose a safety hazard.

Note: The hydraulic actuators, if used, will contain large amounts of stored energy; therefore, the accumulator must be adequately protected from perforation or breakage.

Hydraulic Start Motor (Optional Cat Dealer Supplied)

Cat dealers may be able to supply a hydraulic starter for the engine should the customer require it. They are often chosen for emergency generators when a independent method of starting is required.

COMBUSTION AIR SYSTEM

GENERAL

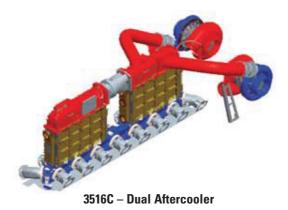
The aftercooler system is a High Performance Air Cooling (HPAC) system designed in a modular layout. This is system is composed of dry, shielded turbochargers and charge air piping, managing a better combustion efficiency. By means of this design improvement the heat transfer to the cooling system is minimized and the combustion gets more efficient as there is less heat loss, providing more available power. At the same time the piping design is less complex, with single air intake tracts per cylinder.

The aftercooler is a two stage system consisting of jacket water cooled first stage and a separate circuit second stage.

The aftercooler arrangement varies from the single aftercooler for the 3512C to the dual aftercoolers for the 3516C.



3512C - Single Aftercooler



The maximum inlet air temperature to the turbocharger is 50°C (122°F) in accordance with the marine society rules for equipment performance, and will provide good engine component life. For temperatures above 50°C (122°F), the engine may derate to a power output level required for safe engine operation.

The 3500C engine normally draws engine combustion air in one of two ways:

- The engine room is supplied with air for engine combustion as well as for removal of radiated heat. Engine-mounted air filters provide combustion air filtration.
- The engine room is supplied with ventilation air for engine heat removal and the engine combustion air is supplied separately through a dedicated, filtered air intake system.

Either system should be designed to provide sufficient clean air for combustion and heat removal based on the ambient conditions and the maximum ratings for each piece of installed equipment (i.e. marine auxiliary engines, pumps, and switchgear). For classed vessels, the specific societies have well-defined rules for the design parameters.

The amount of combustion air necessary for the 3500C engine is specified in the technical data section of this manual. The amount of radiated heat emitted by each engine is also specified.

COMBUSTION AIR SYSTEM DESIGN CONSIDERATIONS

Engine Room Supplied Air

The location and design of the engine room air intakes should consider the following:

- The supply air outlets should be close to and directed at the engine turbocharger air intakes.
- Additional air should flow along the generator, coupling, and engine to absorb the radiated heat. The air flow should flow in the order stated above as the radiated heat from the engine will cause unnecessary temperature rise in the generator.
- The engine room air inlets should be placed such that water or dirt cannot enter.

• Installations intended for operation in extreme cold may require heated air for starting purposes. In addition, it may be necessary to control the inlet boost pressure for cold air installations. Contact your Cat dealer or the regional Cat representative for further information when extreme ambient conditions are expected.

Separate Combustion Air System

Supplying the engines with direct outside air for combustion, if possible, is beneficial to the installation for a number of reasons. It reduces the air movement in the engine room, may reduce the cooling load on the charge air cooler, reduce the maximum heat load on the cooling water heat exchanger and in turn reduce the required sea water circulation in the system. Direct air to the turbocharger inlet may provide a larger margin against engine load reduction brought on by high air inlet temperatures.

It should be expected that, if the turbocharger inlets are supplied with engine room air, a temperature rise of 5 to 10°C (9 to 18°F) above ambient would take place. By supplying the engines with direct outside air the vessel will also reduce the required fan work.

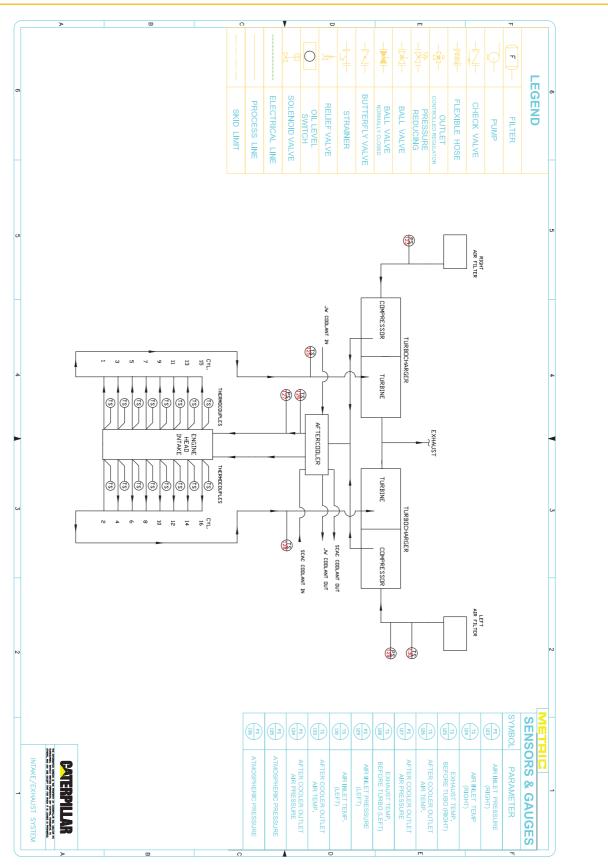
If the engine combustion air is supplied through a separate, dedicated air system, the engine room design should consider the following.

The entire intake system, including clean air filters should have an initial restriction of no greater than 254 mm H_2O (10 in. H_2O). The maximum inlet restriction with dirty air filters should not exceed 635 mm H_2O (25 in. H_2O).

Flexible connections are necessary to isolate engine vibration from the ducting system. Locate the flex connection as close to the engine as possible, but be aware of the excessive heat generated by the exhaust system. Avoid supporting excessive lengths of ductwork off the turbocharger.

Caterpillar has specially designed the air intake components to provide the proper airflow pattern before the turbocharger. Turbocharger performance may be adversely affected if these components are not used.

INTAKE/EXHAUST SCHEMATIC



ENGINE ROOM VENTILATION

GENERAL

Although not part of the Caterpillar scope of supply for a typical diesel generator package, the engine room ventilation system is a vital part of a successful installation. The two primary aspects of a properly designed engine room ventilation system addressed in this document are cooling air and combustion air.

- **Cooling Air:** The flow of air required to carry away the radiated heat of the engines and other engine room machinery.
- **Combustion Air:** The flow of air required to burn the fuel in the engines.

Both of these have a direct impact on an engine's or packaged unit's performance, and must be considered in the design of an engine room ventilation system. However, it is important to note that all equipment within the engine room space, not only the diesel generator packages, must be given consideration in the overall ventilation system design process. For the current data please see publication LEBW4971 on Engine Room Ventilation in TMI.

SIZING CONSIDERATIONS

Cooling Air

Engine room ventilation air (cooling air) has two basic purposes:

- To provide an environment that permits the machinery and equipment to function properly with dependable service life.
- To provide an environment in which personnel can work comfortably.

A small percentage of fuel consumed by an engine is lost to the environment in the form of heat radiated to the surrounding air. In addition, heat from generator inefficiencies and exhaust piping can easily equal engine radiated heat. Any resulting elevated temperatures in the engine room may adversely affect maintenance, personnel, switchgear, and engine or generator set performance. The use of insulated exhaust pipes, silencer, and jacket water pipes will reduce the amount of heat radiated by auxiliary sources.

Radiated heat from the engines and other machinery in the engine room is absorbed by engine room surfaces. Some of the heat is transferred to atmosphere, but the remaining radiated heat must be carried away by the ventilation system.

A system for exhausting ventilation air from the engine room must be included in the ventilation system design. The engines will not be able to carry all of the heated ventilation air from the engine room by way of the exhaust piping.

Combustion Air

In many installations, combustion air is drawn from outside of the engine room via ductwork, in which case, the combustion air is not a factor in the ventilation system design calculations.

However, many installations require that combustion air be drawn directly from the engine room. In these installations, combustion air requirements become a significant ventilation system design parameter. Engine-specific combustion air requirements can be found in TMI for the specific engine and rating.

Ventilation Air Flow

Required ventilation air flow depends on the desired engine room air temperature as well as the cooling air and combustion air requirements outlined above. While it is understood that total engine room ventilation air flow must take all equipment and machinery into account, the following sections provide a means for estimating the air flow required for the successful operation of Cat engines and packages.

In general, changing the air in the engine room every one or two minutes will be adequate, if flow routing is proper.

Provisions should be made by the installer to provide incoming ventilation air of 0.1 to 0.2 m³/min (4 to 8 cfm) per installed horsepower. This does not include combustion air for the engines.

Engine Room Temperature

A properly designed engine room ventilation system will maintain engine room air temperatures within 8.5 to 12.5°C (15 to 22.5°F) above the ambient air temperature (ambient air temperature refers to the air temperature surrounding the power plant, vessel, etc.). Maximum engine room temperatures should not exceed 50°C (122°F). If they do, outside air should be ducted directly to the engine air cleaners. The primary reason for cooling an engine room is to protect various components from excessive temperatures. Items that require cool air are:

- · Electrical and electronic components
- Air cleaner inlets
- Torsional dampers
- · Generators or other driven equipment
- Engine room for the engine operator or service personnel.

RADIANT HEAT

Engine Radiant Heat

Engine generated heat must be taken into consideration depending on the 3500C engine. For the current radiant heat data please reference TMI.

Calculating Required Ventilation Air Flow

Engine room ventilation air required for Cat engines and packages can be estimated by the following formula, assuming 38°C (100°F) ambient air temperature.

$$V = \frac{H}{D \times Cp \times \Delta T} + Combustion Air$$

Where:

V = Ventilating Air (m³/min), (cfm)

H = Heat Radiation i.e. engine, generator, aux (kW), (Btu/min)

 $D = Density of Air at 38^{\circ}C (100^{\circ}F) (1.14 \text{ kg/m}^3), (0.071 \text{ lb/ft}^3)$

Cp = Specific Heat of Air (0.017 kW x min/kg x °C), (0.24 Btu/°F)

 ΔT =Permissible temperature rise in engine room (°C), (°F)

Temperature Rise

The temperature rise in the engine room resulting from these heat sources can adversely affect maintenance personnel, switchgear, and generator set performance. A 7 to 10°C (15 to 20°F) temperature rise is a reasonable target for engine rooms. In cold climates, discomfort may be caused by the flow of cold air. Restrict flow only if engine combustion air is available.

Example:

A 1833 kW propulsion engine has the following data:

Heat rejection: 101 kW (5,720 Btu/min)

Temperature rise: 10°C (20°F)

Solution:

The estimated engine room ventilation required for this arrangement:

$$V = \frac{101}{1.099 \times 0.017 \times 10} = 541 \text{ m}^3/\text{min}$$

$$V = \frac{5720}{0.071 \times 0.24 \times 20} = 16,784 \text{ cfm}$$

Ventilation Fans

In modern installations, except for special applications, natural draft ventilation is too bulky for practical consideration. Adequate quantities of fresh air are best supplied by powered (fan-assisted) ventilation systems.

Fan Location

Fans are most effective when they withdraw ventilation air from the engine room and exhaust the hot air to the atmosphere. However, ideal engine room ventilation systems will use both supply and exhaust fans. This will allow the system designer the maximum amount of control over ventilation air distribution.

Fan Type

Ventilation fans are typically of the vane-axial, tube-axial or propeller type, or the centrifugal type (squirrel cage blowers). The selection of fan type is usually determined by ventilation air volume and pressure requirements, and also by space limitations within the engine room. When mounting exhaust fans in ventilation air discharge ducts, which are the most effective location, the fan motors should be mounted outside the direct flow of hot ventilating air for longest motor life. The design of centrifugal fans (squirrel cage blowers) is ideal in this regard, but their size, relative to the vane-axial or tube-axial fans, sometimes puts them at a disadvantage.

Fan Sizing

Fan sizing involves much more than just selecting a fan that will deliver the air flow volume needed to meet the cooling air and combustion air requirements determined earlier in this section. It requires a basic understanding of fan performance characteristics and ventilation system design parameters.

Similar to a centrifugal pump, a fan operates along a specific fan curve that relates a fan's volume flow rate (m³/min or cfm) to pressure rise (mm H_2O or in. H_2O) at a constant fan speed. Therefore, fan selection not only requires that the volume flow rate be known, but also that the ventilation distribution system be known in order to estimate the system pressure rise. This information allows the optimum fan to be selected from a set of manufacturers' fan curves or tables.

Exhaust Fans

Ventilation air exhaust systems should be designed to maintain a slight positive or negative pressure in the engine room, depending on the specific application.

Generally, maintaining a slight positive pressure in the engine room is recommended, but should normally not exceed 50 kPa (200 in. H_20) . This positive pressure accomplishes several things:

- It prevents the ingress of dust and dirt, which is especially beneficial for those applications involving engines that draw their combustion air from the engine room.
- · It creates an out-draft to expel heat and odor from the engine room.

Some applications require that a slight negative pressure be maintained in the engine room, but normally not in excess of 12.7 mm H₂O (0.5 in. H₂O). The excess exhaust ventilation air accomplishes several things:

- It compensates for the thermal expansion of incoming air.
- · It creates an in-draft to confine heat and odor to the engine room.

Two-Speed Fan Motors

Operation in extreme cold weather may require reducing ventilation airflow to avoid uncomfortably cold working conditions in the engine room. This can be easily done by providing ventilation fans with two-speed (100% and 50% or 67% speeds) motors.

Routing Considerations

Correct ventilation air routing is vital for creating and maintaining the optimum engine room environment required to properly support the operation of Cat engines and packaged units. Maintaining recommended air temperatures in the engine room is impossible without proper routing of the ventilation air.

Fresh air inlets should be located as far from the sources of heat as practical and as high as possible; and since heat causes air to rise, it should be exhausted from the engine room at the highest point possible, preferably directly over the engine. Where possible, individual exhaust suction points should be located directly above the primary heat sources in order to remove the heat before it has a chance to mix with engine room air and raise the average temperature.

However, it must be noted that this practice will also require that ventilation supply air be properly distributed around the primary heat sources. Avoid ventilation air supply ducts that blow cool air directly toward hot engine components. This mixes the hottest air in the engine room with incoming cool air, raising the temperature of all the air in the engine room, and leaves areas of the engine room with no appreciable ventilation.

For offshore applications, where the potential exists for sea water to be drawn into the ventilation air supply, combustion air should be delivered in a manner that will preclude any sea water from being ingested by the turbochargers through the air intake filters.

These general routing principles, while driven by the same basic principles of heat transfer, will vary with the specific application. This section discusses the general considerations relating to 1 and 2 engine applications, multiple engine (3+) applications, and several special applications.

1 and 2 Engine Applications

These applications will generally require smaller engine rooms, which may sometimes preclude the use of good routing practices.

Recommended ventilation systems for these applications, presented in order of preference, are described below.

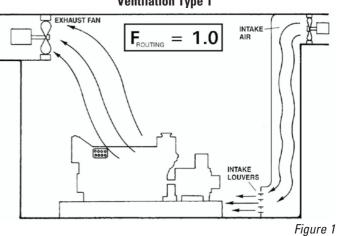
Ventilation Types 1 and 2 (Preferred Design)

Outside air is brought into the engine room through a system of ducts. These ducts should be routed between engines, at floor level, and discharge air up at the engines and generators. The most economical method is to use a service platform, built up around the engines, to function as the top of this duct. See Figure 2.

This requires the service platform to be constructed of solid, nonskid plate rather than perforated or expanded grating. The duct outlet will be the clearance between the decking and oilfield base.

Ventilation air exhaust fans should be mounted or ducted at the highest point in the engine room. They should be directly over heat sources.

This system provides the best ventilation with the least amount of air required. In addition, the upward flow of air around the engine serves as a shield which minimizes the amount of heat released into the engine room. Air temperature in the exhaust air duct will be higher than engine room air temperature.



Ventilation Type 1

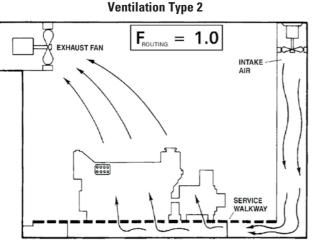


Figure 2

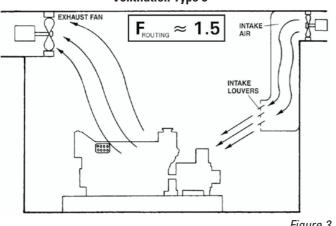
Ventilation Type 3 (Alternate Design)

If ventilation type 1 is not feasible, the following method is recommended; however, it will require approximately 50% more air flow.

Outside air is brought into the engine room as far away as practical from heat sources, using fans or large intake ducts. The air is discharged into the engine room as low as possible as illustrated in Figure 3. Allow air to flow across the engine room from the cool air entry points toward sources of engine heat such as the engine, exposed exhaust components, generators, or other large sources of heat.

Ventilation air exhaust fans should be mounted or ducted at the highest point in the engine room. Preferably, they should be directly over heat sources.

Engine heat will be dissipated with this system, but a certain amount of heat will still radiate and heat up all adjacent engine room surfaces. If the air is not properly routed, it will rise to the ceiling before it gets to the engines.



Ventilation Type 3

This system will work only where the air inlets circulate the air between the engines, for two-engine applications. Air inlets located at the end of the engine room will provide adequate ventilation to only the engine closest to the inlet.

Ventilation Type 4 (Alternate Design)

If ventilation types 1 and 2 are not feasible, the following method can be used; however, it provides the least efficient ventilation and requires approximately 2.5 times the air flow of ventilation types 1 and 2.

Outside air is brought into the engine room using supply fans. and discharged toward the turbocharger air inlets on the engines as illustrated in Figure 4.

Ventilation exhaust fans should be mounted or ducted from the corners of the engine room. This system mixes the hottest air in the engine room with the incoming cool air, raising the temperature of all air in the engine room. It also interferes with the natural convection flow of hot air rising to exhaust fans. Engine rooms can be ventilated this way, but it requires extralarge-capacity ventilating fans.

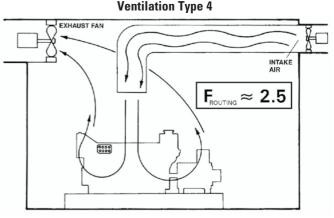


Figure 4

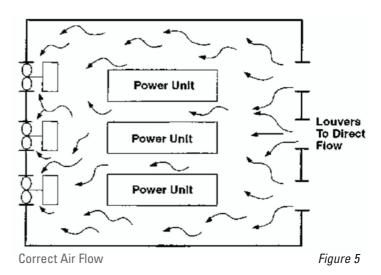
Multiple Engine (3+) Applications

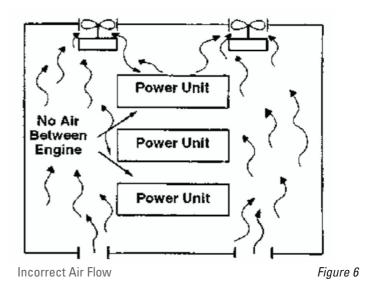
Multiple engine applications, involving three or more engines or packaged units, will generally require larger engine rooms than those needed for 1 and 2 engine applications.

In general, the recommended ventilation systems outlined for 1 and 2 engine applications also apply to multiple engine applications. However, there are several additional considerations that are specific to multiple engines.

As previously mentioned, the application of normal temperature rise guidelines for determining large multiple engine site ventilation requirements will generally result in extremely large volumes of air. Therefore, the guidelines used for these sites are significantly more generous; however, even with the increased temperature rise allowed, the ventilation requirements will be significant. Large multiple engine sites will generally use multiple ventilation fans, often using one or two fans for each engine. This practice allows for a very simple arrangement requiring minimal ductwork.

The use of multiple ventilation fans, either supply or exhaust, will require that air flow between the engines be arranged, either by fan placement or by distribution ductwork. Figure 5 and Figure 6 show examples of correct and incorrect air flow patterns for multiple engine sites.





EXHAUST SYSTEM

GENERAL

A well-designed exhaust system should convey the engine's exhaust gases out of the engine room, through piping, to atmosphere. A good exhaust system will have minimum backpressure.

The 3500C engine uses a direct dry-shielded flow exhaust system to turn the turbine wheel. Exhaust gases from the exhaust manifold go into the turbine side of the turbocharger. A single exhaust connection has been arranged to simplify the external piping weight and volume/routing.



EXHAUST SYSTEM DESIGN CONSIDERATIONS

Exhaust Backpressure Limit

The total 3500C exhaust backpressure limit is 6.7 kPa (27 in. H_2 0). This level was established with an emphasis on low specific fuel consumption and exhaust valve temperatures. Therefore, to achieve proper performance of the engine, the exhaust backpressures must be kept below this limit.

System backpressure should be measured in a straight length of the exhaust pipe at least 3 to 5 pipe diameters away from the last size transition from the turbocharger outlet. System backpressure measurement is part of the engine commissioning.

Note: Specified system backpressure shall not be exceeded in any circumstances. Caterpillar advises to limit value of maximum allowable backpressure to 50% for new (clean) installations. Minimum diameter of customer piping should be according to "Customer piping diameter overview for Caterpillar engines."

Turbochargers

The turbochargers are located at the flywheel end of the engine. The turbocharger exhaust outlet is a 430 mm (17") flange connection. Optional attachments for these turbochargers include ø 355 mm (14") flexible bellows, expansion transitions from ø 355 mm (14") to ø 406 mm (16") and exhaust flanges with bolting and mounting hardware. Also available is a 355 mm (14")-457 mm (18") expander and exhaust flanges with bolting and mounting hardware for longer exhaust runs.

The exhaust bellows are intended to compensate for thermal growth and movement of the engine. The exhaust system

structure immediately after the engine exhaust bellows must be a fixed/rigid point. The supplied exhaust bellows will only handle the engine movement and thermal growth. No additional external loading is allowed on the turbochargers.

Exhaust Slobber (Extended Periods of Low Load)

Prolonged low load operation should be followed by periodic operation at higher load to burn out exhaust deposits. Low load operation is below 456 kPa BMEP (approximately 20% load, depending on rating). The engine should be operated above 912 kPa BMEP (about 40% load, depending on rating) periodically to burn out the exhaust deposits.

Exhaust Piping

A common exhaust system for multiple engines is not acceptable. An exhaust system combined with other engines allows operating engines to force exhaust gases into engines not operating.

The water vapor condenses in the cold engines and may cause engine damage. Additionally, soot clogs turbochargers, aftercoolers, and cleaner elements. Valves separating engine's exhaust systems are also discouraged. High temperatures warp valve seats and soot deposit causes leakage.

The exhaust pipe diameter is based on engine output, gas flow, length of pipe, and number of bends. Sharp bends should be avoided, and where necessary, should have the largest possible radius. The minimum radius should be 1-1/2 pipe diameters.

The piping should be as short as possible and insulated. The insulation should be protected by mechanical lagging to keep it intact. All flexible exhaust fittings should be insulated using removable quilted blankets. It is recommended to provide the system with a valve drain arrangement to prevent rainwater from entering the engine during prolonged shutdown periods.

For testing purposes, the exhaust system must have a test port installed after the turbocharger outlet. This test port should be a 10 to 13 mm (0.394 to 0.512 in.) plugged pipe welded to the exhaust piping and of sufficient length to bring it to the outer surface of the insulated piping.

Exhaust Supports

It is important to consider how the exhaust piping is supported off the engine. Caterpillar has set maximum allowable bending moments and static weights that can be mounted on to the turbochargers.

For a 3512 Engine:

Max Bending Moment = 49 N•m (Newton Meters) Max Static Weight = 33 kg

For a 3516 Engine:

Max Bending Moment = 49 N•m (Newton Meters) Max Static Weight = 33 kg

It is important that these figures are not exceeded. If the turbocharger outlet is overloaded, it might cause the turbocharger outlet housing components to fail. It is also important that the exhaust piping through the engine room and the vessel is adequately supported throughout its length.

Please Note: The maximum static weight limits and static bending moments do not take into account the Caterpillar supplied bellow or expender, etc.

Exhaust Silencer (Optional Cat Dealer Supply)

An exhaust silencer, if required, can be supplied with the engine by your Cat dealer. The size of the silencer needs to be taken into account to make sure there is sufficient room for it to fit within the vessel's structure.

The nominal bore of the exhaust needs to be considered when sizing the exhaust silencer. Typical nominal bore sizes are given below for the following 3500 series engines.

Please note: When selecting a silencer for an engine insallation consideration needs to be given to the length of the exhaust run and the exhaust system backpressure. A longer than normal exhaust run might require a larger silencer so that the exhaust backpressure is kept within the required limits set by Caterpillar.

If the engine is being supplied for a fishing application, your Cat dealer will typically supply an FP1 silencer that has 25 dB(A) attenuation. These silencers are much smaller than the class-approved silencers and fit more easily into the vessel structure/ engine room.

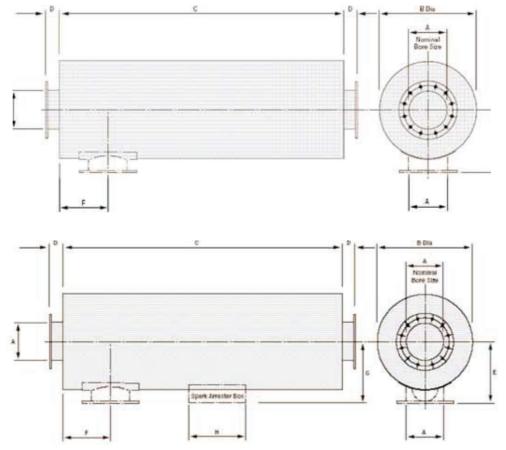
If the vessel is to be built to class, it might require a spark arrestor silencer to be fitted. It will depend on the ship type whether or not a silencer is required. Generally, a silencer is required when the exhaust piping runs through dangerous gas zones on vessels such as oil carriers and supply vessels.

- **3512B** Typically requires a 12" (304.8 mm) nominal bore exhaust pipe.
- **3516B** Typically requires a 14" (355.6 mm) nominal bore exhaust pipe.

The units can be mounted vertically, horizontally, or inclined without affecting efficiency. The silencers will give equal performance regardless of its position within the exhaust line. However, for optimum acoustic performance, the silencer should be positioned within 50 pipe diameters of the exhaust outlet and have a tailpipe of approximately ten pipe diameters in length.

It is possible that a silencer can be designed to suit a specific application/space if required. Consultation with our silencer manufacturer would be necessary to see what can and cannot be done. Any specially designed silencers would incur additional cost that would have to be factored into the quote.

Please Note: If the customer is unsure if they require a classification society-approved spark arrestor silencer, one should be supplied anyway or the owner's classification society should be contacted with details about the vessel's application and where in the world the vessel will be used.



Exhaust Backpressure Limits

As the exhaust gases pass through the exhaust system it experiences frictional resistance – causing backpressure on the engine turbocharger discharge.

The maximum exhaust backpressure for a 3500 series engine is 6.72 kPa or 27 in. H_2O .

To ensure these limits are not exceeded during operation, Caterpillar recommends that the design limit not be more than one-half the specified backpressure limits.

Please Note: Excessive exhaust backpressure needs to be avoided, as it will shorten exhaust valve and turbocharger life due to increased exhaust temperatures. Excessive exhaust backpressures will also cause the engine to run inefficiently.

Exhaust Bellows (Optional Caterpillar Supply)

Exhaust bellows to be mounted between the turbocharger outlet and the exhaust pipe for the engine can be supplied by Caterpillar. The exhaust expander is designed to absorb the vibrations that are present between the vessel's hull and the engine.

Growth and shrinkage of the exhaust pipe must be planned for or it will create excessive loads on exhaust piping and supporting structure. If required, extra exhaust bellows can be fitted into the exhaust piping system to absorb the thermal expansion of the system. The exhaust bellows can be supplied from either Caterpillar or your Cat dealer.

Exhaust Expander (Optional Caterpillar Supply)

If required, the exhaust expander can be fitted to the outlet of the turbocharger to increase the cross sectional area of the exhaust. It might be a requirement to fit an exhaust expander when a long exhaust run is used on board the vessel to achieve the desired Caterpillar recommended exhaust backpressure.

Exhaust Piping (Yard Supply)

The exhaust piping is to be supplied by the yard. Caterpillar can advise the yard on the correct exhaust pipe sizing to ensure that the engine operates with the correct backpressure. The exhaust piping should be adequately supported throughout its length in such a way that it is allowed to expand and retract under normal service. Please Note: Under no circumstances should a common exhaust be used in a multiple-engine installation as this would be very detrimental to engine parts and components.

Individual Cylinder Exhaust Temperatures

Caterpillar can supply individual exhaust thermocouple probes for the engine if required by the owner. The advantage of having such a probe will immediately indicate an individual injector failure. The individual exhaust temperatures can be displayed on a cylinder temperature display unit that Caterpillar can supply.

Please Note: Exhaust temperature probes that are supplied by Caterpillar will produce a signal of between 0 and 42mA to display the exhaust temperatures.

Insulation (Yard Supply)

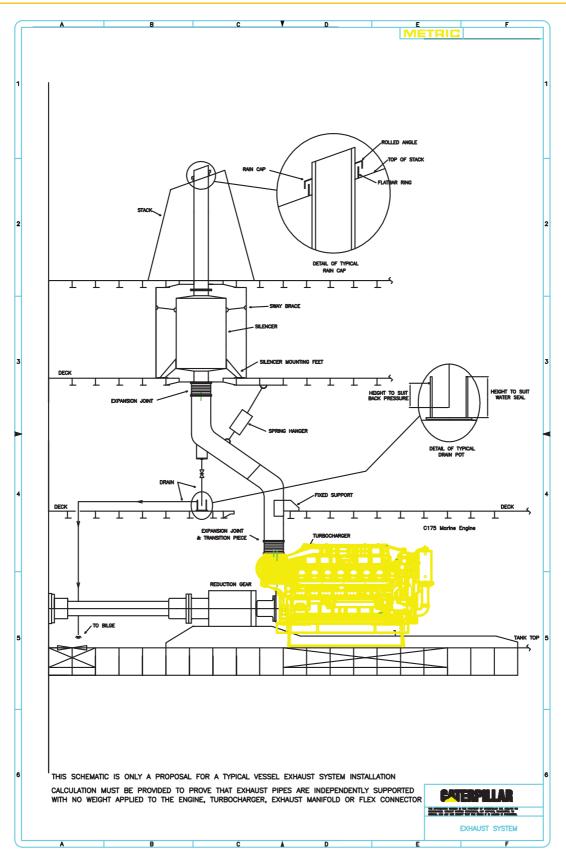
The engine will be supplied from Caterpillar with lagging on the exhaust manifolds and up to the turbocharger inlets. The lagging that is supplied from Caterpillar meets the current SOLAS hot surfaces requirements.

SOLAS requires that all surfaces above 220°C (428°F), which can be impinged as a result of a fuel failure, be insulated. This also insulates the turbocharger exhaust casing when the turbocharger exceeds temperatures of 220°C.

Generally it is the responsibility of the engine installer to protect combustible parts of the boat and provide personal protection from the heat of dry exhaust system piping. Exposed parts of dry exhaust systems can exceed 650°C (1200°F). Any lagging that is used within the exhaust system is subject to be approved to the classification societies.

Please Note: Refer to SOLAS regulations for the precise wording of the regulations relating to the requirements of lagging on the exhausts. It will also be up to the yard/owner to contact the classification society to ensure their requirements are fulfilled.

EXHAUST SYSTEM SCHEMATIC



ENGINE GOVERNING AND CONTROL SYSTEM

INTRODUCTION

This section and the following section describe the A4 ECU monitoring system. The standard control system offering is the Caterpillar MPD 3.0.

Engine Governing System

- A4
- Direct Rack



32-Bit A4 Electronic Control Unit (ECU)

- Increased Processing Speeds
- Enhanced Memory
- Optimized Performance with More Fuel Maps
- Improved Protection and Diagnostics
- High-speed Data Link
- Open Architecture Software Compatible with all Displays
- Reliable and Durable: Tested Under Extreme Conditions

Standard Control System Highlights

- Engine-mounted instrument panel with Marine Power Display (MPD), four-position engine control switch with alarm horn, graphic display unit for analog or digital display of oil and fuel pressure, oil and fuel filter differential, system DC voltage, exhaust and water temperature, air inlet restriction, service meter, engine speed, fuel consumption (total and instantaneous)
- Cold mode start strategy minimizes white smoke during cold starts
- Programmable engine de-rate strategies
- Programmable low idle
- Electronic diagnostics and fault logging
- Engine and gear monitoring (speed, temperature, pressure)
- Fuel/air ratio control
- ECU controlled pre-lube and cranking
- ECU controlled engine cooldown

ENGINE MONITORING AND SHUTDOWN

Engine Shutdown

The Marine 3500C is installed with safety shutoff protection – electrical for oil pressure, water temperature, overspeed, crankcase pressure, aftercooler temperature, air inlet shutoff activated on overspeed or emergency stop, oil pressure and water temperature (non-redundant, uses OP and WT sensors) and overspeed (redundant and independent of engine). High oil mist level alarm and/or shutdown are not standard as this is to satisfy marine societies which require this feature on engines above 2250 bkW.

Alarms

Alarms for the Marine 3500C are ECU voltage, oil pressure, water pressure (low and high), overspeed, crankcase pressure, aftercooler temperature, low water level (sensor is optional attachment) and filter differential pressure (oil and fuel).

Engine Derate

The Marine 3500C will derate with the following:

- High water temperature
- Crankcase pressure
- Aftercooler temperature
- Air inlet restriction
- Exhaust temperature

Sensors

The following sensors are mounted on the engine:

- Primary speed/timing
- · Secondary speed/timing
- · Timing calibration
- Aftercooler temperature
- Filtered fuel pressure
- Unfiltered fuel pressure
- Filtered lube oil pressure
- Unfiltered lube oil pressure
- Turbocharger outlet pressure
- Right turbo inlet pressure
- Left turbo inlet pressure
- Atmospheric pressure
- Crankcase pressure
- Coolant temperature
- Right exhaust temperature
- Left exhaust temperature
- Transmission oil pressure (to be mounted on the transmission)
- Transmission oil temperature (to be mounted on the transmission)

SERVICE TOOL CONNECTOR

Lamps

- Low oil pressure
- High coolant temperature
- Low coolant level
- Maintenance
- Warning

Switches

- Engine throttle synchronization
- Engine control
- · Engine protection override
- Prelube pressure
- Prelube override
- · Override verify

Relays

- Air shutoff
- Shutdown notify
- · Starting motor

CUSTOMER-INSTALLED CONNECTIONS

THROTTLE POSITION SENSORS

Relays

• Hour meter

Monitoring Systems

- Engine monitoring system
- Marine analog power display
- Marine power display
- · Engine vision

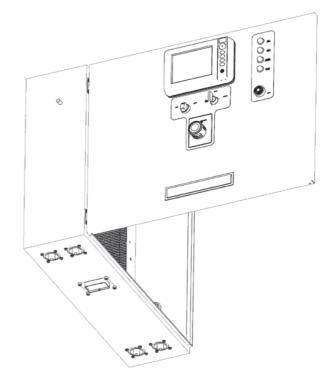
Following are available monitoring systems for the 3500 series engines.

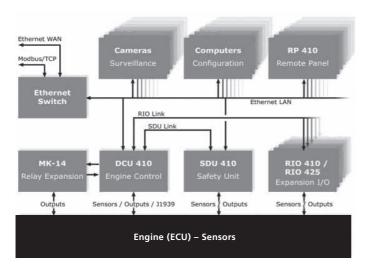
MPD 3.0 (Standard Panel)

The Instrument panel used on the marine 3500C module is the MPD 3.0 panel. Below is a brief description of the MPD 3.0 instrument panel. More information can be found in the publication LEGM8130. The MPD 3.0 panel uses the color MPD display panel which is easy to use and offers the same features and capabilities as the MPD but in a color display. This uses a high-resolution screen (640 by 480 pixels) that is a fully graphic, transflective, positive image LCD with adjustable illumination levels that can display up to four NTSC camera inputs. Red LED edge lighting for gauges and function buttons provides low light level visibility. The screen has viewing angles up to 115°. Customized screens can be designed on-screen or via the screen builder software for up to three different users to display different engine parameters on different sizes and types of gauges. The custom screen files can be flashed to the MPD using the Cat Electronic Service Tool (ET). An SAE J1939 data link provides information from the engine ECU to the display module.



Color Marine MPD





Engine Monitoring and Control Unit

The DCU 410 is the engine monitoring and control unit. One panel is required for each engine. The DCU 410 has a color screen and buttons for user interaction.



Safety Unit

The safety unit is linked to the DCU engine control unit, and is mandatory in classed installations that are to be type approved.

I/O Expansion Unit

The I/O expansion unit is linked to the DCU. The DCU will find the I/O expansion unit automatically. A maximum of four RIO units can be connected to one DCU.

Generator Interface Unit

The generator interface unit is linked to the DCU. The DCU will find the generator interface unit automatically. When connected, a new page is made available on the DCU and on the remote panel that displays generator parameters. Following are some of the parameters that are shown: phase voltages, phase currents, frequency, power, efficiency factor.

Remote Panel

The remote panel is used in conjunction with the DCU engine panels. Numerous RP remote panels can be connected together in the same ethernet network.



If the engine is being built to class then it is a requirement that the classification society approves the engine control and monitoring system.

Your Cat dealer can supply an Auto Maskin system that is accepted by all the major classification societies.

Auto Maskin (Cat Dealer Supply) - Class Requirement

If the engine is being built to classification society requirements, it is necessary for the engine to be fitted with a classification society-approved monitoring system. The Auto Maskin system can be used for control and monitoring of propulsion engines or generator sets. Auto Maskin is an electronic unit for control and monitoring of diesel engines used as auxiliary or emergency generator sets, or as propulsion engines.

Auto Maskin is classified by major societies for marine use. It has built-in communication facilities and can be expanded with slave panels. Auto Maskin is easily configured using the Rudolf R2 software that is a Microsoft Windows based program. Your Cat dealer engineers can carry out this configuration if required. For flexibility, different expansion modules can be connected.

The Caterpillar supplied engine sensors are not approved by classification societies. Classification societies require the engine control and monitoring systems to be run independently of one another so the failure of one system does not affect the function of other systems. The only exception is when one system directly dependent on the function of another.

Please refer to the following list of required parameters.

CUSTOMER COMMUNICATION MODULE (CCM)

If required, a customer communication module can be supplied. The purpose of the CCM is to provide a two-way link between the A4 ECU and the operator of a personal computer or programmable logic controller, or other device with an RS-232C port.

A CCM module will be required if Auto Maskin is supplied with the engine or if the operator wishes to use some other type of third-party alarm and monitoring software. A CCM module allows the customer to remotely control and monitor the engine at distances beyond the standard 30 m (100 ft) data link limit.

It is important that the CCM is protected from direct contact with liquids. Using a CCM module, a number of parameters can be displayed on the customer's chosen software.

CLASSIFICATION SOCIETY REQUIRED PARAMETERS

Following is a list of monitored parameters that are required by classification societies. There are a couple of exceptions within this list which have been highlighted as available options for operators.

Please Note: The following list is not exhaustive. Further checks will need to be made with the customer's classification societies to make sure that the engine will meet the requirements of the individual classification societies.

Fuel Oil System

 Fuel oil pressure after filter (engine inlet) – This is used to give an indication of loss of fuel oil pressure that might have resulted from a broken fuel line or failed fuel pump.

Lubricating Oil System

- Lube oil pressure to the engine The lube oil pressure to the engine is monitored to make sure the lube oil engine is reaching the engine at the correct pressure. Generally there are two conditions that need to be alarmed, low lube oil pressure at low speed and low lube oil pressure at high speed.
- Lube oil filter differential pressure A differential pressure switch is fitted to give the operator an indication when the lube oil filters need to be cleaned.
- Lube oil inlet temperature The lube oil temperature to the engine is monitored to make sure the oil is reaching the engine within the desired temperature range. At higher temperatures the lube oil starts to lose some of its lubricating properties.
- **Oil mist detection (Optional Caterpillar Supply)** It is not a classification requirement for an oil mist detector to be fitted to all the 3500C series engines.

Please Note: An oil mist detector will be required for the 3516C series engine as these engines are above the 2250 bkW power threshold set by classification societies.

Sea Water Pressure

 Sea water pump differential pressure – The sea water pump differential pressure is installed across the sea water pump to give warning of any discontinuity in sea water.

Jacket Water Cooling System

- Jacket water pressure The jacket water pressure to the engine is monitored to ensure that the jacket water is reaching the engine at the correct temperature and pressure. Loss of jacket water pressure could cause substantial damage to the engine.
- Jacket water outlet temperature The jacket water outlet temperature is monitored to ensure it within the parameters that have been set down by Caterpillar. A high jacket water outlet temperature can cause significant damage to the engine. Quick action is required to minimize damage to the engine components.
- Jacket water level It is important that a jacket water level alarm is used on the engine to give an early indication of a loss of engine coolant.

Starting and Control Air Systems

• Starting air pressure before main shutoff valve

Air Inlet Manifold

• Air inlet manifold temperature

Exhaust Gas System

- Exhaust gas temperature The engine will come from the factory as standard with the exhaust gas temperature after each cylinder (optional Caterpillar supply). This is not required by class but can be fitted to the engine if required by the operator. If used, this will give immediate indication of an individual injector failure.
- Exhaust gas temperature deviation (Optional Caterpillar supply) – If the operator decides to install an exhaust gas temperature probe after each cylinder, it is possible to install an exhaust gas temperature deviation alarm. This would warn the operator when the exhaust temperatures are out of balance. This would identify a failed injector or particularly hot unit that might require the fuel timing to be adjusted.

Engine Speed

• Engine rpm – It is important that an accurate indication of the engine speed is displayed at all times. The operator will be able to compare the engine speed, vessel load, and throttle position to make informed judgements about the engine load and the need for maintenance.

Engine Overspeed

 Indication of engine overspeed – The only time the engine will overspeed is when some part of the engine fails, causing the fuel control mechanism to be locked in a fuel flow condition. When the operator tries to reduce the engine load it will continue to receive a high fuel flow. Without load the engine speed will increase to a dangerously high level. Generally the air supply must be cut off to save the engine.

The overspeed contactors need to be set 12-15% over rated engine speed to avoid nuisance engine shutdowns during sudden reductions in the engine load.

LOOM CABLES

Wiring will be required from the engine to the helm and from the engine to the throttle position sensors. It is important to quote the length of cables as accurately as possible although in certain cases it can be difficult to do this without a detailed vessel layout drawing. In cases when it is difficult to quote exact lengths, approximate costs should be used and a note inserted into the quote stating that the cost of the cables is subject to change once accurate lengths can be sourced. In cases where lengths are given it is important that the cables are supplied slightly longer then specified so there is sufficient length in the cables to allow them to be fitted to equipment.

FISHING APPLICATIONS

If the engine is being supplied for a fishing application, it is not a requirement for it to be built to class. However, certain modifications are required to satisfy the requirement of the flag authorities.

Particular attention should be given to MSN 1770 – *The Fishing Vessels Code of Safe Working Practice for the Construction and Use of 15 meter length overall (LOA) to less than 24 meter registered length (L) Fishing Vessels.*

Flag authorities should be contacted directly if there are any queries relating to the build specification of the engine.

Sump Pipe (Cat Dealer Supply)

A steel pipe is required to be fitted from the base of the sump to a height above the level of oil in the sump. This is used to pump out the sump when an oil change is required. The pipe is fitted with a quick coupling at one end so that a hose and the oil are directed to a suitable container.

Sump Pump (Optional Caterpillar) – Electric or Hand

A sump pump is required so that the oil in the sump can be pumped out of the sump to a drum or other suitable reception container. Caterpillar can supply a hand pump and your Cat dealer can supply a 24-volt electric sump pump depending on what the owner requires.

Fuel Cooler (Caterpillar Supply)

It is a requirement that these engines are fitted with a fuel cooler. The excess fuel returned to the fuel tank picks up heat from the injectors and cylinder heads and can raise the temperature of the fuel within the tanks.

To avoid decreased injector life, fuel temperature to the engine must not exceed 150°F (66° C). Depending on the engine build, your Cat dealer can supply a separate fuel cooler.

Caterpillar delivers fully integrated plate coolers to cool the engine's jacket water as well as the fuel and lube oil. If the periods of operation are short, the amount of heat returned to the tank will be relatively small. Also, if the time between operations is long, any heat will have time to dissipate.

POWER TAKE OFFS

Depending on the customer's requirements they might need to take an extra drive off the front of the engine.

PTO Drives (Optional Caterpillar Supply)

The engine can be fitted with a left- and or right-hand PTO drive if required. These PTO drives are typically fitted with pulleys that Caterpillar can supply fitted to the engine.

Stub Shaft (Optional Caterpillar Supply)

A stub shaft can be fitted to the front of the engine if the customer requires an extra power take off to be fitted. The stub shaft can be supplied with the engine from Caterpillar for low and full horsepower applications depending on the requirements of the customer.

Pulley (Optional Caterpillar Supply)

If the customer requires a crankshaft pulley to drive external equipment, Caterpillar can supply a 6-groove crankshaft pulley.

Please Note: In order to fit a crankshaft pulley the stub shaft has to be fitted to the engine.

ENGINE MOUNTING AND FOUNDATION DESIGN

PROPULSION ENGINE MOUNTING AND FOUNDATION

This section deals with propulsion engine and reduction gear foundations and their relationship to ship framing.

Exact analytical methods cannot always be used to design engine foundations. The design is also influenced by several factors, including previous successful installations, the designer's experience, and the basic dimensions of the specific engine being installed. Refer to this guide for specific information on 3500C engine weights and dimensions.

The engine foundation must resist vertical, horizontal and fore-and-aft deflection. It should also be integrated into the reduction gear foundation to connect the overall structure to the ship's inner bottom structure. In this manner, the thrust from the propeller and the dynamic forces from the main engine and reduction gear are evenly distributed over a large area of the inner bottom structure. If the engine foundation has too little resistance against deflection, it may show up during the alignment of the engines as the mount depressions may be influenced by the combination of foundation deflection and engine forces, and may be out of tolerance.

The main engine foundation must have sufficient rigidity to transmit static and dynamic forces from the main engine into the foundation.

- facilitate chock installation
- provide a "work shelf" for servicing the side of the engine
- permit installation of side blocks and collision chocks

The main engine and reduction gear foundation must also be designed to absorb the loads from:

- ship's vibration
- propeller thrust
- thrust and torque of the engine
- ship's motion at sea
- thermal, static, and dynamic effects
- crash reversal

Because the loads originate from sources other than the engine, the foundation sections should be uninterrupted and have adequate section strength.

To avoid natural frequency resonance between engine and hull, the engine's 1st and 2nd order free forces and moments must be taken into account when designing the mounting structure. The ship builder must ensure that resonance between torque excitation and the natural transverse hull frequencies does not occur. Upon request, Caterpillar will supply engine 1st and 2nd order free forces and moments.

The engine foundation must have sufficient rigidity to minimize shafting and coupling deformation between the engine and gear.

3500C ENGINE-RELATED FREQUENCIES				
Excitation Frequency	Cause of Excitation	Design of Component's Natural Frequencies		
½ order = ½ x engine speed	(Correctable) misfiring of one or more cylinders	Stay Above		
1st order = 1 x engine speed	Unbalance, misalignment, crankcase overfill (Correctable)	Stay Above		
1½ order = 1.5 x engine speed	Normal cylinder combustion (NOT Correctable)	Avoid: side to side and roll modes excited by this order		
2nd order = 2 x engine speed	Normal cylinder combustion (NOT Correctable)	Avoid: side to side and roll modes excited by this order		
3rd order = 3 x engine speed	Firing frequency for a six (6) cylinder engine or one bank of a twelve (12) cylinder engine (NOT Correctable)	Avoid: side to side and roll modes excited by this order		
4th order = 4 x engine speed	Firing frequency for an eight (8) cylinder engine or one bank of a sixteen (16) cylinder engine (NOT Correctable)	Avoid: side to side and roll modes excited by this order		
6th order = 6 x engine speed	Firing frequency for a six (6) cylinder engine or one bank of a twelve (12) cylinder engine (NOT Correctable)	Avoid: side to side and roll modes excited by this order		
8th order = 8 x engine speed	Firing frequency for an eight (8) cylinder engine or one bank of a sixteen (16) cylinder engine (NOT Correctable)	Avoid: side to side and roll modes excited by this order		

The girder and faceplate must:

• increase bending inertia of the structure

MOUNTING

The engine can be supplied with two different types of mounting systems depending on the engine being supplied and the requirements of the vessel it is to be installed in.

Rigid Mounting (Caterpillar Supply)

The engine supports and shims, etc. are mounted directly to the boats structure. To ensure the engine is correctly aligned the engine is shimmed with either steel or poured plastic. Flexibility is built into the engine supports to ensure that the motions in the hull do not overstress the engine block.

Resilient Mounting (Optional Caterpillar)

Resilient mounting of the engine is usually done to isolate noise and vibrations from the ship's structures. This can have considerable effect on crew and passenger comfort, reduced crew fatigue and, therefore, increased efficiency. Flexible fittings must be used for all connections, e.g., exhaust gas, coolant, fuel, etc. The resilient mounts are fitted with a motion-limiting device to prevent the breaking of the engine's cooling and exhaust connections during bad weather or after collision/grounding.

The flywheel-mounted flexible coupling must be selected with care. It must routinely tolerate the ranges of side-to-side and fore/aft motions predicted for the given set of soft mounts.

Consideration must be given to how any auxiliary equipment that is coupled to the engine is mounted and the method of connecting the two. The 3500C family engines are normally on flexible mounts (i.e., rubber with steel springs). The standard mounting feet configuration uses four mounting feet, two on each side of the engine. There is an option to add one foot to each side if needed. Two mounting options provides vessel design flexibility:

• Rail mounted



· Front cross-member/rear trunnion mount



As shown in both solutions structural oil pan provides optimum location for mounting rails.

Resin Chocks

Normally, the flexible mounts are installed with a resin chock between the engine and the engine foundation.

The chocking arrangement, planning, and pouring should be reviewed by an approved manufacturer. The shipyard will have the final responsibility for the planning and installation of chocking material.

General

All mounting systems must have provisions for alignment retention, collision stops, and engine thermal growth.

MISCELLANEOUS

ENGINE WEIGHTS

The following weight schedule lists the weights of the 3500C series engines and optional supplied items. Select the optional items and add to the engine's dry weight to estimate the weight of an engine shipset.

ENGINE WEIGHTS				
Engine Model	3512C kg	3512C lb	3516C kg	3516C Ib
Engine Dry Weight (see note 1 below)	7,411	16,338	9,170	20,216
Torsional Coupling	319	703	319	703
Plate Type, Heat Exchanger	250	551	202	443
Water Temperature Regulator	86	190	86	190
Primary Fuel Strainer	11	24	11	24
Pressure Reduction Valve	20	44	20	44
Freshwater Expansion Tank	135	297	135	297
Exhaust Pieces: (Turbocharger Adapter, Bellows, Expander to 18 inch)	134	295	134	294
Lube Oil @ (.9097 kg/liter)	569	1,254	734	1,618
Freshwater Coolant	157	346	234	516
Heat Exchanger (FW & SW)	61	135	70	154
Total Weight per Engine				

Notes:

1. One (1) "Engine Dry Weight" consists of the following engine-mounted items: a one-piece, gray iron cylinder block, governor actuator, two freshwater pumps, one sea water pump, one lube oil filter, fuel and lube oil duplex filters, centrifugal lube oil filters, electric prelube pump, exhaust shielding, intake air silencer, air starting motors, barring device, oil mist detector, flywheel, and 6 anti-vibration mounts.

2. All weights are in kilograms/pounds

ENGINE MAIN DIMENSIONS AND CENTER OF GRAVITY

Engine Model	3512C kg	3512C Ib	3516C kg	3516C Ib
Main Engine Dimensions				
Length	3232	127.2	3773	148.5
Width	2160	85.0	2284	89.9
Height	2205	86.8	2224	87.55
Center of Gravity				
X Dimension – From rear face of block	895	35.2361	1187	46.7322
Y Dimension – From center line of crankshaft	217	8.5433	197	7.7559
Z Dimension – From center line of crankshaft	5	0.1969	5	0.1969

SPARE PARTS

Depending on the engine build any number of spares can be purchased with the engine.

Classification Society Spares

If the engines are supplied as a class build, the classification society strongly recommends a minimum number of spares are carried onboard the vessel. Caterpillar can supply the spares required and specified by the owner's specified classification societies.

This matter is subject to constant review by classification societies and the customer would need to check with their own classification societies to see if class spares were strongly recommended or a requirement.

Note: If the owner requires class spares, it is more economical for them to be ordered with the engine.

Flag Authorities Requirements

The flag authorities usually require adequate spares be provided for normal operation of the main machinery, auxiliary machinery, and electrical equipment, with regard to the intended service of the vessel. Such spares should include fuel filters, oil filters, sea water pump spares, bilge pump spares, fuses, and light bulbs.

Additional Spares

If the engine is not supplied as a class build or flag build, your Cat dealer can supply the owner with any spares they require. They can be purchased from your Cat dealer either when the engine is ordered or through any Cat dealer branch at a later date. Where the engine has not been built to class it is still strongly recommended that the vessel owner purchase a number of spares with the engine.

Caterpillar would highly recommend operators of our engines carry a minimum number of spares so the engine can be used safely in service and necessary repairs can be carried out onboard. Your Cat dealer can advise the owner on a suitable number or type of spares to carry onboard, depending on the operator's engine arrangements and operation of service.