

DIESEL DRIVEN PUMPUNIT HK500-CAT C11/3406/3306



VAN HECK BV

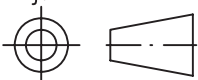
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n=640r.p.m.
 $\varnothing 660 \angle 15^\circ$
 turned out

projection



drawn

PB

checked

approved

file

3

project no.

drawing no.

280990-04

rev.

D

PUMPUNIT HK500

PUMP

General

The HK pump is a single-stage mixed-flow centrifugal pump for lifting large quantities of water to medium heads.

The pump is suitable for heavily contaminated and unpurified water.

The pump types HK are not self-priming, but by using the Van Heck priming system and non-return valve, the pump will be made self-priming.

Type	: HK-500
Capacity	: see performance curve 280990-04 rev B
Connections	: suction 750 mm stc880 / discharge 500 mm stc620

Pump Casing

A solid circular casing with a tangential discharge nozzle Ø 500 mm, which can be turned 360 degrees in discrete steps.

The pump casing is supported by a cast iron bearing block with 4 integrally casted feet.

Shaft Seal

Sealing is by means of gland packing with grease lubrication.

A stainless steel sleeve in the seal area protects the shaft.

Materials

Pump casing	: cast-iron GG20
Bearing block	: cast-iron GG20
Shaft	: steel (st 50)
Shaft sleeve	: stainless steel
Impeller	: cast-iron GG20

GEARBOX

To reduce the engine speed of 1,800 rpm to the pump speed of 640 rpm, a gearbox is mounted directly to the bearing block of the pump. This gearbox, type TW-500-G, designed by Van Heck, is sufficient to cope with an input of 250 HP at 1,800/640 rpm ($i = 2,81$). The gearbox is provided with a cooling pump, which pumps the cooling water from the radiator through the gearbox.

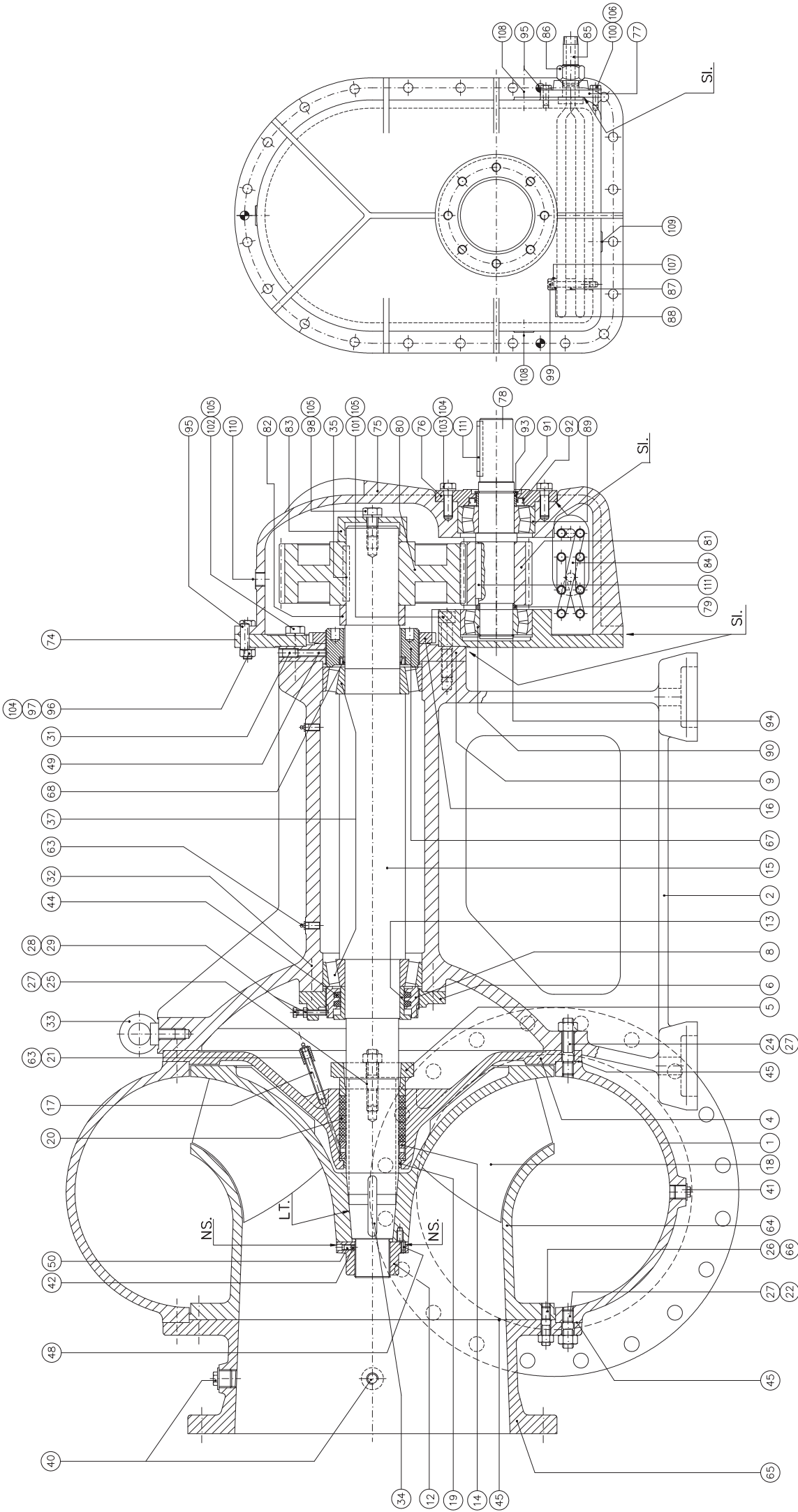
PRIMING SYSTEM

The Van Heck priming system consists of a vacuumpan, which is mounted at the suction nozzle of the pump and a continuously driven air-cooled, oil lubricated vacuum pump.

In combination with a non-return valve on the discharge flange, the pump becomes self-priming.

Make : Demag Wittig
Type : SL 15-1 VR
Capacity : 110 m³/hr
Vacuum : 100 mbar (90%)

The vacuum pump is cooled by a radial fan mounted on the rotor shaft and is provided with an automatic lubrication oil pump. Finally the vacuum system is provided with an oil separator and an exhaust to reduce the noise.



SI: Afdichten met siliconenpakking
NS: Monteren met Neversize multigrade
LT: Vastzetten met Loctite

OPM.: - Speling tussen waaler (POS.18) en zuigmond (POS.65) afstellen op 0.5mm met stelling 8.
 - Axiale lagerspeling met stelling 67 afstellen op 0.2 ~ 0.3mm.
 - Uitlijning tandwielen controleren met pruisisch blauw.



Engine Performance Data

Cummins Inc

Columbus, Indiana 47202-3005
<http://www.cummins.com>

Industrial

QSL

FR91525

300 BHP (224 kW) @ 1800 RPM
1,000 lb-ft (1,356 N-m) @ 1400 RPM

Configuration
D563004CX03

CPL Code
8641-SC10

Revision
12-Jan-2007

Compression Ratio: **17.8:1**

Fuel System: **CCR**

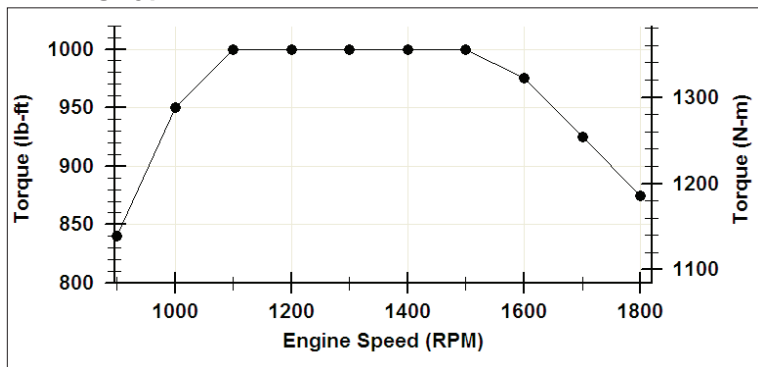
Emission Certification: **U.S. EPA Tier 3, CARB Tier 3, EU Stage IIIA**

Displacement: **543 in3 (8.9 L)**

Aspiration: **Turbocharged and Charge Air Cooled**

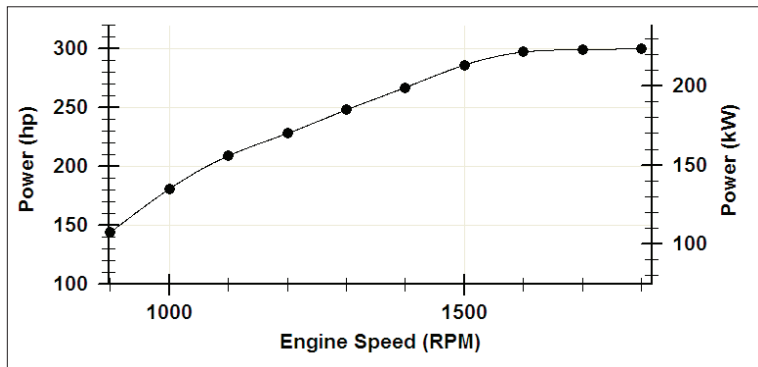
All data is based on the engine operating with fuel system, water pump, and 15 in H₂O (3.73 kPa) inlet air restriction with 6 in (152 mm) inner diameter, and with 3 in Hg (10 kPa) exhaust restriction with 4 in (102 mm) inner diameter; not included are alternator, fan, optional equipment and driven components. Coolant flows and heat rejection data based on coolants as 50% ethylene glycol/50% water. All data is subject to change without notice.

Rating Type: Continuous/WMR



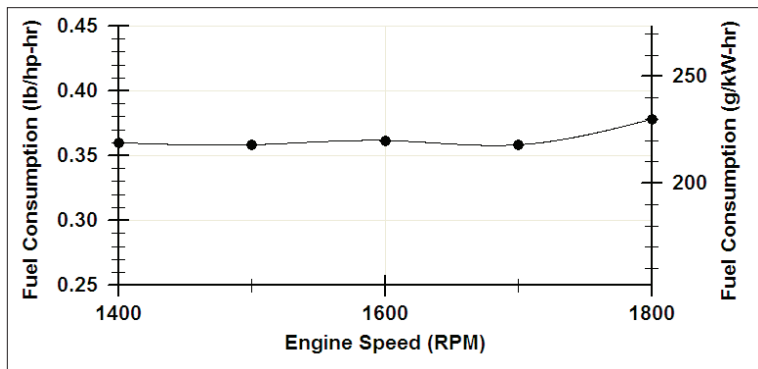
Torque Output

RPM	lb-ft	N-m
900	840	1,139
1,000	950	1,288
1,100	1,000	1,356
1,200	1,000	1,356
1,300	1,000	1,356
1,400	1,000	1,356
1,500	1,000	1,356
1,600	975	1,322
1,700	925	1,254
1,800	875	1,186



Power Output

RPM	hp	kW
900	144	107
1,000	181	135
1,100	209	156
1,200	228	170
1,300	248	185
1,400	267	199
1,500	286	213
1,600	297	221
1,700	299	223
1,800	300	224



Fuel Consumption

RPM	lb/hp-hr	g/kW-hr
1,400	0.36	219
1,500	0.358	218
1,600	0.362	220
1,700	0.358	218
1,800	0.378	230

Curves shown above represent gross engine performance capabilities obtained and corrected in accordance with SAE J1995 conditions of 29.61 in Hg (100 kPa) barometric pressure [300ft (91m) altitude] 77 deg F (25 deg C) inlet air temperature, and 0.30 in Hg (1kPa) water vapor pressure with No. 2 diesel fuel. The engine may be operated up to 8,000 ft (2,438 m) altitude before electronic derate is applied.

STATUS FOR CURVES AND DATA:

TOLERANCE: Within +/- 5 %

CHIEF ENGINEER:

Mark A Sublette

Intake Air System

Maximum allowable air temperature rise over ambient at Intake Manifold (Naturally Aspirated Engines) or Turbo Compressor inlet (Turbo-charged Engines): (This parameter impacts emissions, LAT and/or altitude capability) 30 delta deg F 16.7 delta deg C

Charge Air Cooling System

Maximum intake manifold temperature at 25 deg C (77 F) ambient 120 deg F 49 deg C
 Maximum allowable pressure drop across charge air cooler and OEM CAC piping (IMPD): 4 in-Hg 14 kPa
 Maximum Intake Manifold Temperature Differential (Ambient to IMT) (IMTD): 43 delta deg F 23.9 delta deg C
 Intake manifold temperature for Fan-ON 120 deg F 49 deg C
 Maximum coolant temperature for engine protection controls 225 deg F 107 deg C
 Maximum coolant operating temperature at engine outlet (max. top tank temp): 225 deg F 107 deg C

Exhaust System

Maximum exhaust back pressure: 3 in-Hg 10 kPa
 Recommended exhaust piping size (inner diameter): 4 in 102 mm

Lubrication System

Nominal operating oil pressure
 @ minimum low idle 10 psi 69 kPa
 @ maximum rated speed 58 psi 400 kPa
 Minimum engine oil pressure for engine protection devices
 @ minimum low idle 8 psi 55 kPa

Fuel System

Fuel cooling requirements (with diesel fuel)
 Maximum heat rejection to return fuel at max. coolant and inlet fuel temperature: 70 BTU/min 1 kW
 @ fuel return flow rate of: 165 lb/hr 75 kg/hr
 @ fuel return temperature prior to cooler: 250 deg F 121 deg C
 Maximum supply fuel flow: 302 lb/hr 137 kg/hr
 Maximum return fuel flow: 165 lb/hr 75 kg/hr
 Engine fuel compatibility (consult Service Bulletin #3379001 for appropriate use of other fuels) DF1, DF2
 Maximum fuel inlet pressure: 10 psi 69 kPa

Performance Data

Maximum low idle speed: 1,200 RPM
 Minimum low idle speed: 600 RPM
 Minimum engine speed for full load sustained operation:

	Rated Power		Maximum Power		Torque Peak	
Engine Speed	1,800 RPM				1,400 RPM	
Output Power	300 hp	224 kW			267 hp	199 kW
Torque	875 lb-ft	1,186 N-m			1,000 lb-ft	1,356 N-m
Friction Horsepower	39 hp	29 kW			25 hp	19 kW
Intake Manifold Pressure	50 in-Hg	168 kPa			48 in-Hg	164 kPa
Turbo Comp. Outlet Pressure	49 in-Hg	166 kPa			47 in-Hg	159 kPa
Turbo Comp. Outlet Temperature	342 deg F	172 deg C			334 deg F	168 deg C
Inlet Air Flow	657 ft ³ /min	310 L/s			504 ft ³ /min	238 L/s
Charge Air Flow	50 lb/min	23 kg/min			39 lb/min	18 kg/min
Exhaust Gas Flow	1,708 ft ³ /min	806 L/s			1,375 ft ³ /min	649 L/s
Exhaust Gas Temperature	1,051 deg F	566 deg C			1,044 deg F	562 deg C
Maximum Fuel Flow to Pump	302 lb/hr	137 kg/hr			0 lb/hr	0 kg/hr
Heat Rejection to Coolant	5,346 BTU/min	94 kW			4,697 BTU/min	83 kW
Heat Rejection to Fuel	70 BTU/min	1 kW				
Heat Rejection to Ambient	2,070 BTU/min	36 kW			1,655 BTU/min	29 kW
Heat Rejection to Exhaust	12,454 BTU/min	219 kW			9,725 BTU/min	171 kW
**Steady State Smoke	0.6 Bosch				0.3 Bosch	

**When operating Naturally Aspirated engines above SAE J1995 conditions, it should be noted that smoke levels will increase due to combustion inefficiencies associated with a reduction in the air to fuel mixture.

Cranking System (Cold Starting Capability)

Unaided Cold Start:

Minimum cranking speed	130 RPM	
Minimum ambient temperature for unaided cold start	10.4 deg F	-12 deg C
Bare Engine cranking torque at minimum unaided cold start temperature:	162 lb-ft	220 N-m

Aided Cold Start:

Minimum ambient temperature with Grid Heater only	-24 deg F	-31 deg C
Minimum ambient temperature with coolant and lube heater only	-40 deg F	-40 deg C

Cold starting aids available

Intake Manifold Heater, Block Heater, Oil Pan Heater

Maximum parasitic load at 10 deg F @

Noise Emissions

Top	97.2 dBa
Right Side	97.2 dBa
Left Side	97.2 dBa
Front	97.2 dBa

Exhaust noise emissions

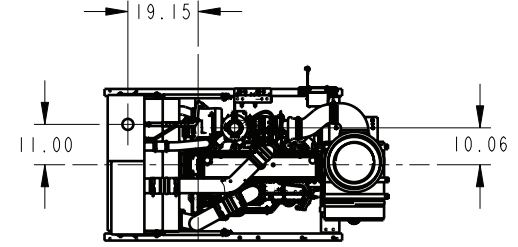
Estimated Free Field Sound Pressure Level at 3.28ft (1m) and Full-Load Governed Speed
(Excludes Noise from Intake, Exhaust, Cooling System and Driven Components)

End of Report

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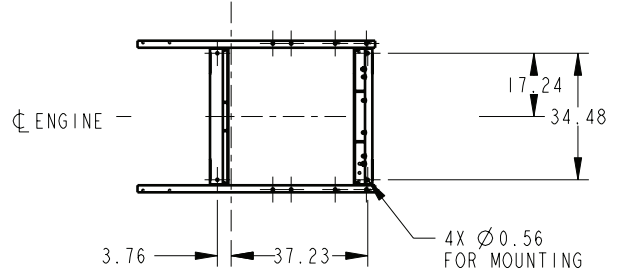
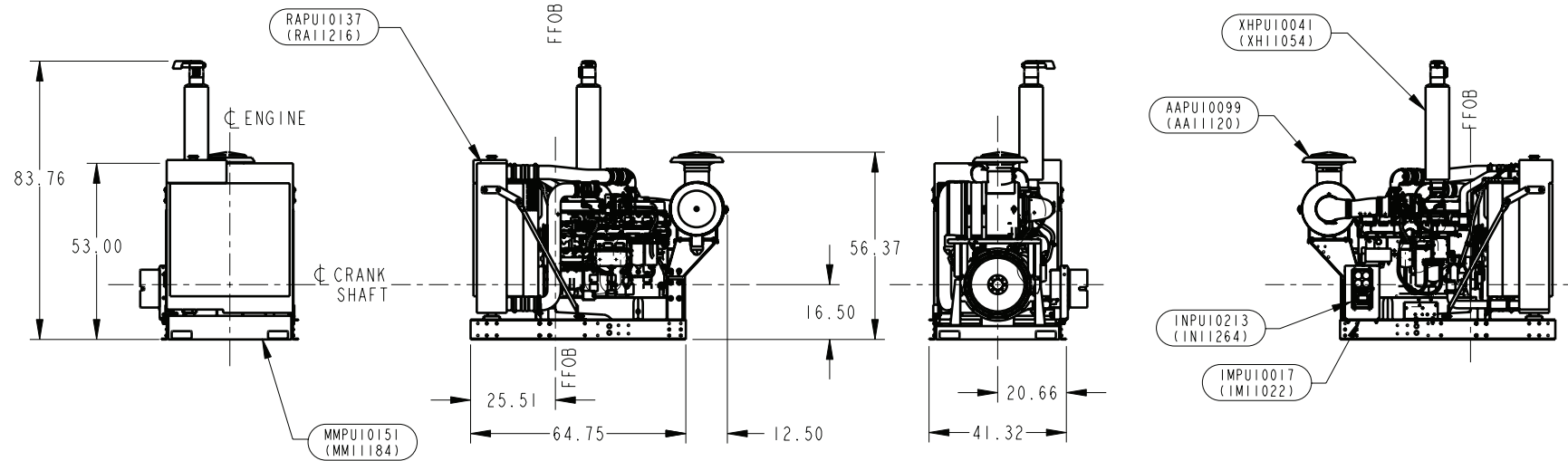
DRAWING NUMBER
60000181

REVISIONS				
REV	DATE	CHANGE	BY	ER#
0	5/25/04	PRELIMINARY	JEOP	R04049
1	5/11/05	RELEASED FOR PRODUCTION	AJM	R05178
2	4/3/07	UPDATED IN OPTION	AJM	



REAR ATTACHMENT INFORMATION:

- A.) SAE#1 FLYWHEEL HOUSING
 7/16-14 UNC2B
 1.14 [29.0] DEEP
 12 HOLES EQUALLY SPACED
 ON A Ø20.8 [530.2] B.C.
 FLYWHEEL TO SUIT 15.5"
 OVERCENTER CLUTCH
 (SHOWN)
- B.) SAE#3 FLYWHEEL HOUSING
 M10-1.5-6H
 0.98 [25.0] DEEP
 12 HOLES EQUALLY SPACED
 ON A Ø16.87 [428.6] B.C.
 FLY WHEEL TO SUIT 10" OR 11.5"
 OVERCENTER CLUTCH
 (NOT SHOWN)



NOTE:
DUE TO MANUFACTURING VARIANCES,
DIMENSIONS MAY VARY UP TO 0.25"

PRICE SPEC.
3622/3676/3650/3621/3669

REF. DRAWING STANDARDS: ANSI Y14.5M, ISO R1101		ALL DIMENSIONS: INCH	
CUMMINS POWER PRODUCTS		NEW HUDSON, MICHIGAN	
DRAWN BY JEO	DATE 5/25/04	DRAWING DESCRIPTION	SHEET 1 OF 1
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