

Product News

Cat® C18 Marine Propulsion Engine

Market	Marine Propulsion
Application	Pleasure Craft Vessels
Description	The new C18 marine propulsion engine is now available. With an E rating of 1015 metric horsepower the C18 is intended for applications with a load factor of up to 30% and operating time at rated speed up to 8%. A D rating of 885 metric horsepower is also available.
Features/Benefits	<p>With phenomenal acceleration and outstanding performance the C18 proves to be a top competitor in the 1000 brake horsepower class.</p> <p>The new C18 propulsion engine has 25% more power, faster acceleration than the 3406E, and has an excellent power-to-weight ratio of 1.56 kg per metric horsepower or 3.49 lbs per brake horsepower. Even though the C18 has a slightly larger package it weighs approximately the same as the 3406E.</p> <p>The ADEM III electronic control system is more efficient with improved reliability and expandability, and provides increased engine control and monitoring capabilities.</p>
General Comments	<p>C18 DITTA Heat Exchanger cooled configurations:</p> <p>C18DM00 C18 DITTA Marine Propulsion — Port (RH service) 1015 mhp (1000 bhp) 746 bkW at 2300 rpm E rating</p> <p>C18DM01 C18 DITTA Marine Propulsion — Port (RH service) 885 mhp (875 bhp) 653 bkW at 2300 rpm D rating</p> <p>C18DM02 C18 DITTA Marine Propulsion — Starboard (LH service) 1015 mhp (1000 bhp) 746 bkW at 2300 rpm E rating</p> <p>C18DM03 C18 DITTA Marine Propulsion — Starboard (LH service) 885 mhp (875 bhp) 653 bkW at 2300 rpm D rating</p>

Information contained in this publication may be considered confidential. Discretion is recommended when distributing. Materials and specifications are subject to change without notice.

CAT, CATERPILLAR, ADEM, their respective logos, "Caterpillar Yellow" and the POWER EDGE trade dress, as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.

©2007 Caterpillar
All rights reserved.
Printed in U.S.A.

Contents

Product Description 3

Standard and Optional Equipment..... 4

Engine Features 5

C18 and 3406E Comparison 6

Competitive Information 6

Customer Programmable Parameters 7

Maintenance Schedule 8

Sensor Locations 9

General Dimension Drawings..... 10-17

Product Description

I-6, 4-Stroke-Cycle-Diesel

Emissions IMO compliant
 Displacement — L (cu in) 18.1 (1106)
 Bore — mm (in)..... 145 (5.7)
 Stroke — mm (in) 183 (7.2)
 Aspiration..... Turbocharged-Aftercooled
 Governor Electronic
 Engine Weight, net dry
 (approx.) — kg (lb) 1586 (3496)
 Refill Capacities
 Cooling System (engine and
 expansion tank) — L (qt) 45 (48)
 Lube System — L (qt)..... 49 (52)
 Oil Change Interval..... 250 hours
 Rotation (from
 flywheel end) Counterclockwise

Dimensions (drawing 207-0024)
 Overall Length — mm (in) . . 1845.2 (72.64)
 Length from front to rear face
 of block — mm (in)..... 1401.9 (55.19)
 Length from front to end of flywheel
 housing — mm (in) 1557.0 (61.30)
 Overall Width — mm (in) . . 1057.9 (41.65)
 Width from crankshaft centerline to
 left side — mm (in)..... 520.1 (20.48)
 Width from crankshaft centerline to
 right side — mm (in) 537.8 (21.17)
 Overall Height — mm (in) . . 1158.6 (45.62)
 Height from crankshaft centerline to
 top of engine — mm (in) . . 812.8 (32.00)
 Height from crankshaft centerline to
 bottom of oil pan — mm (in) . . 345.8 (13.61)
 Engineering Model E645
 Serial Number Prefix..... CKH
 Performance Number . . DM6446 (1000 bhp)
 DM6445 (872 bhp)

Service Information
 Operation & Maintenance ... SEBU7689
 Parts Book SEBP3351

Core Engine Arrangement Numbers

201-0563	PA7765
226-1190	PA7766
227-8204	PA0599
227-8205	PA0500

E rating	RH Service
E rating	LH Service
D rating	RH Service
D rating	LH Service



Image may not
reflect actual engine

C18 Marine Propulsion Engine

Standard Equipment

Adjustable front support
Air cleaner/fumes disposal (closed system)
Coolant recovery system
Corrosion resistant aftercooler core (SWAC)
Crankcase breather
Customer wiring connector
Engine oil cooler
Fuel filter (RH or LH service)
Fuel priming pump
Fuel transfer pump
Gear driven jacket water pump
Instrument panel with electric service meter, start/stop button, emergency stop button, maintenance due lamp, diagnostic lamp, warning lamp, 15 amp and 30 amp breakers, starter motor magnetic switch
Oil filler in valve cover
Oil filter (RH or LH service)
Oil level gauge (RH or LH service)
SAE No.1 flywheel (113 teeth) and flywheel housing
Self-priming centrifugal auxiliary sea water pump with rubber impeller
Service tool connector
Shallow center sump oil pan
Titanium plate heat exchanger with expansion tank
Thermostat and housing
Watercooled exhaust manifold
Watercooled turbocharger
12V or 24V electronic protection system

Optional Equipment

Air Starting Motor
Alarm Contactor, Trans. Oil Temp. & Press.
12V 51 Amp, 12V 105 Amp Alternator
24V 35 Amp, 24V 60 Amp Alternator
Alternator Pulley Belt Guard
10 Amp Battery Charger
24V Battery Set
Bilge Pump & Drive
Custom Paint
12V/24V DC Converter
Digital Tachometer
Deep Sump Oil Pan
Electric Starting Motor
Engine Monitoring System
Engine-to-Engine Wiring Harness
Engine Vision Display System
GPS Interface Module
12V Instrument Panel
Jacket Water Heater
Magnetic Pickup
Manual Sump Pump
Marine Power Display
OEM Wiring Harness
Primary Fuel Filter
Pulley and Damper
Seawater Lines
Single Station Control Panel
Throttle Position Sensor
Transmission Oil Cooler
Vibration Isolation Mounting

Engine Features

Excellent Power-to-Weight Ratio

With a 25% increase in power at approximately the same weight of the 3406E, the C18 engine has an outstanding power-to-weight ratio of 1.56 kg per metric horsepower or 3.49 lbs per brake horsepower.

Larger Bore, Stroke, and Displacement

The larger bore and stroke give the C18 24% greater displacement from a slightly larger package size than the 3406E.

Higher Capacity Fuel Injectors

Higher flow fuel injectors provide more fuel for combustion and in turn produce more power.

Faster Response

The two smaller turbochargers require less inertia to engage and thus provide more boost at lower engine speeds.

Outstanding Acceleration and Performance

This additional power provides quicker acceleration and allows the vessel to come up on plane faster.

Electronic Control System

The ADEM III electronic control system provides engine speed governing, automatic air/fuel ratio control, engine parameter monitoring, and system diagnostics, as well as cold start strategy, engine synchronization, trolling mode strategy, and slow vessel mode. The C18 has a 70-pin customer connector compatible with the optional display systems – Marine Power Display, Marine Analog Power Display, and Engine Vision. C18 is also compatible with the Multi-Station Control System when available.

Seawater Aftercooling and Integral Heat Exchanger System

The C18 engine has seawater aftercooling (SWAC) which also contributes to greater power output. The titanium plate heat exchanger incorporates the expansion tank, deaerators, thermostats, shunt line and crossover pipe providing a compact design.

Extremely Low Emissions

The design of the camshaft helps the engine develop higher injection pressures for lower smoke levels. The closed crankcase ventilation system removes oil vapor from the engine room.

Top Quality Appearance

High quality white urethane paint is standard with an optional superior quality custom paint finish available.

C18 and 3406E Comparison

	3406E	C18	Difference
Power — mhp bhp	811 800	1015 1000	+ 204 + 200
Bore — mm in	137.2 5.4	145.0 5.7	+ 7.8 + 0.3
Stroke — mm in	165.1 6.5	183.0 7.2	+ 17.9 + 0.7
Displacement — L cu in	14.6 893	18.1 1106	+ 3.5 + 213
Weight — kg lb	1586 3496	1586 3496	No Change No Change
Power-to-Weight — kg/mhp lb/bhp	1.95 4.37	1.56 3.49	- 0.39 - 0.88
Fuel Consumption at Rated Speed — L/hr gph	153.5 40.6	195.0 52.0	+ 43.5 + 11.5
BSFC at Rated Speed — g/kW-hr lb/hp-hr	216.0 .355	220.0 .361	+ 4.0 + .006
Length — mm in	1822.7 71.8	1845.2 72.6	+ 22.5 + 0.8
Width — mm in	953.6 37.5	1057.9 41.7	+ 104.3 + 4.2
Height — mm in	1177.8 46.4	1158.6 45.6	- 19.2 - 0.8

Competitive Information

	Rating mhp/bkW @ rpm	Configuration	Max. Power at Cruising Speed mhp @ rpm	Displacement Liters	Fuel System	Weight kg/lb	Dimensions L x W x H mm/in
Cat C18	1015/746 @ 2300	In-line 6	1015 @ 1900	18.1	Full Electronic	1586/3486	1845 x 1058 x 1159 72.6 x 41.6 x 45.6
MAN D2840 LE 403 EDC	1050/772 @ 2300	V10	966 @ 1900	18.3	Electronic Common Rail	1560/3432	1333 x 1229 x 1033 52.5 x 48.4 x 40.7
Cat 3406E	811/597 @ 2300	In-line 6	811 @ 1900	14.6	Full Electronic	1586/3486	1823 x 954 x 1178 71.8 x 37.5 x 46.4

Customer Programmable Parameters

Identification Parameters

Equipment ID	17 alphanumeric characters
Engine Serial Number	8 alphanumeric characters

Engine/Marine Transmission Parameters

Engine Location	Port, Center, Starboard, Engine #1-5 (default — Port)
Fuel-to-Air Ratio	Level 1, Level 2, Level 3 (default — Level 2)
Low Idle Speed	550 rpm to 750 rpm (default — 700 rpm)
Max. Engine Trolling Speed	750 rpm to 1200 rpm (default — 900 rpm)
Trans. Oil Temperature High Set Point	50°C (122°F) to 120°C (248°F) [default — 95°C (203° F)]
Trans. Oil Pressure High Set Point	700 kPa to 2930 kPa (default — 2412 kPa) [100 psi to 425 psi (default — 350 psi)]
Trans. Oil Temperature Sensor	Installed/Not Installed (default — Not Installed)
Trans. Oil Pressure Sensor	Installed/Not Installed (default — Not Installed)
Fuel Correction Factor	-64 to +63.5
FLS	-128 to 127
FTS	-128 to 127

Engine Monitoring Parameters

Engine Monitoring Mode	Warning or Derate
Coolant Level Sensor	Installed/Not Installed (default — Installed)

Maintenance Parameters

Maintenance Indicator Mode	Off, Auto Hour, Auto Fuel, Manual Fuel, Manual Hour
PM1	Maintenance Indicator Mode Dependent
Engine Oil Capacity	19 L (20 qt) to 76 L (80 qt) [default — 28 L (30 qt)]

Passwords

Customer Password #1	8 alphanumeric characters
Customer Password #2	8 alphanumeric characters
3 Cylinder Cutout	On or Off (default — On)

Maintenance Schedule

When Required

Battery – Replace
Battery or Battery Cable – Disconnect
Engine – Clean
Engine Oil Level Gauge – Calibrate
Fuel System – Prime

Daily

Closed Crankcase Ventilation (CCV) Filter
Service Indicator – Inspect
Cooling System Coolant Level – Check
Engine Air Cleaner Service Indicator –
Inspect
Engine Oil Level – Check
Fuel System Primary Filter/Water
Separator – Drain
Marine Transmission Oil Level – Check
Walk-Around Inspection

Every 3800 L (1000 U.S. gal) of Fuel or 50 Service Hours

Zinc Rods – Inspect/Replace

Initial Oil Change

Engine Valve Lash – Inspect/Adjust

PM Level 1 – Every 19 000 L (5000 U.S. gal) of Fuel or 250 Service Hours

Aftercooler Condensate Drain Valve –
Inspect/Clean
Alternator Belt – Inspect/Adjust/Replace
Auxiliary Water Pump (Rubber Impeller)
– Inspect
Battery Electrolyte Level – Check
Cooling System Supplemental Coolant
Additive (SCA) – Test/Add
Engine – Clean
Engine Air Cleaner Element – Clean/Replace
Engine Oil Sample – Obtain
Engine Oil and Filter – Change
Fuel System Primary Filter/Water
Separator Element – Replace
Fuel System Secondary Filter – Replace
Fuel Tank Water and Sediment – Drain
Hoses and Clamps – Inspect/Replace
Sea Water Strainer – Clean/Inspect

Every 28 500 L (7500 U.S. gal) of Fuel or 750 Service Hours or 2 Years

Closed Crankcase Ventilation (CCV)
Fumes Disposal Filter – Replace

PM Level 2 – Every 114 000 L (30 000 U.S. gal) of Fuel or 3000 Service Hours or 2 Years

Heat Exchanger – Inspect
Turbocharger – Inspect

PM Level 3 – Every 228 000 L (60 000 U.S. gal) of Fuel or 3000 Service Hours

Alternator – Inspect
Auxiliary Water Pump (Bronze Impeller) –
Inspect
Cooling System Coolant (DEAC) – Change
Cooling System Coolant Extender (ELC) –
Add
Cooling System Water Temperature
Regulator – Replace
Crankcase Vibration Damper – Inspect
Engine Mounts – Inspect
Engine Valve Lash – Inspect/Adjust
Engine Valve Rotators – Inspect
Starting Motor – Inspect
Water Pump – Inspect

Every 228 000 L (60 000 U.S. gal) of Fuel or 6000 Service Hours or 6 Years

Cooling System Coolant (ELC) – Change

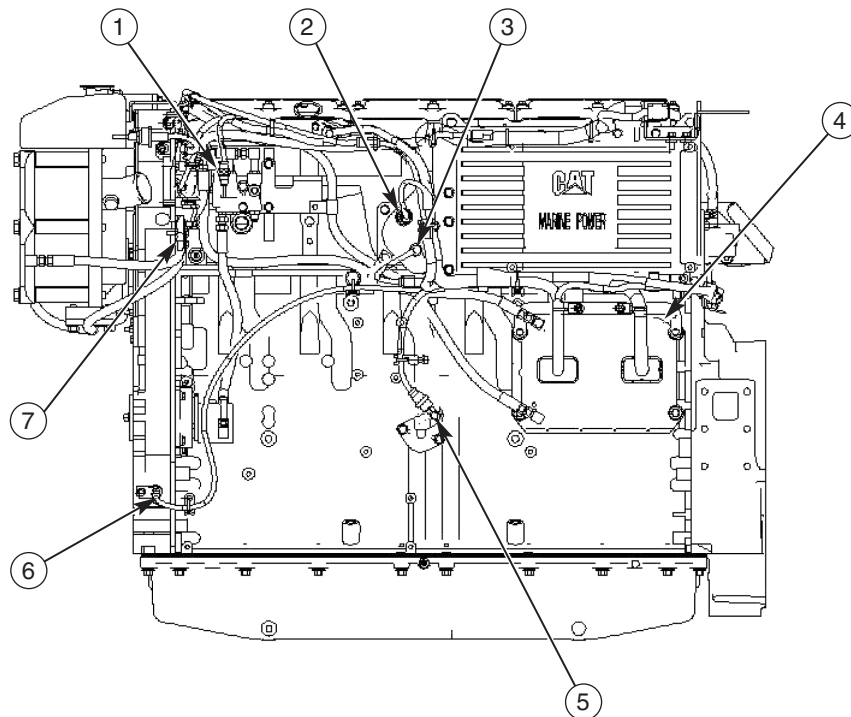
Every 380 000 L (100 000 U.S. gal) of Fuel or 10 000 Service Hours

Cylinder Head Grounding Stud –
Inspect/Clean/Tighten

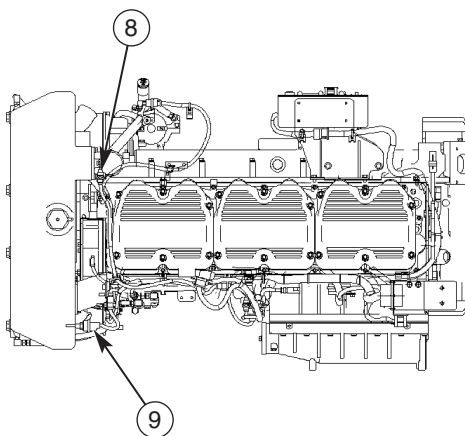
Overhaul

Overhaul Considerations

Sensor Locations — Left Side View

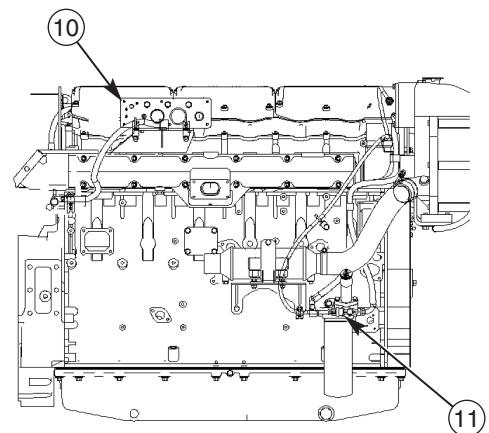


- | | |
|------------------------------------|-----------------------------------|
| (1) Fuel temperature sensor | (5) Oil pressure sensor |
| (2) Inlet air temperature | (6) Primary speed/timing sensor |
| (3) Inlet manifold pressure sensor | (7) Secondary speed/timing sensor |
| (4) Electronic control module | |



- | |
|--------------------------------|
| (8) Coolant temperature sensor |
| (9) Coolant level sensor |

Top Engine Service



- | |
|---------------------------|
| (10) Control panel |
| (11) Fuel pressure sensor |

Right Side Engine Service

Technical Drawing: CAT C18 Marine Engine, Front View

Dimensions (Inches [Millimeters]):

- Overall Width: 1057.9 [41.65]
- Overall Height: 537.8 [21.17]
- Distance from Centerline of Engine to Filler Cap: 520.1 [20.48]
- Distance from Centerline of Engine to Oil Filler: 14.1 [0.56]
- Distance from Centerline of Engine to Sea Water Inlet: 812.6 [31.99]
- Distance from Centerline of Engine to Hydraulic Pump Drive: 812.8 [32.00]
- Distance from Centerline of Engine to Customer Mounting Hole: 1173.1 [46.18]
- Distance from Centerline of Engine to Fuel Filter: 152.1 [5.99]
- Distance from Centerline of Engine to Alternate Customer Mounting Locations: 413.7 [16.29]
- Distance from Centerline of Engine to Air Cleaner: 152.1 [5.99]
- Distance from Centerline of Engine to Oil Level Gage: 152.1 [5.99]
- Distance from Centerline of Engine to Oil Filler: 152.1 [5.99]
- Distance from Centerline of Engine to Filler Cap: 152.1 [5.99]
- Distance from Centerline of Engine to Sea Water Inlet: 152.1 [5.99]
- Distance from Centerline of Engine to Hydraulic Pump Drive: 152.1 [5.99]
- Distance from Centerline of Engine to Customer Mounting Hole: 152.1 [5.99]
- Distance from Centerline of Engine to Fuel Filter: 152.1 [5.99]
- Distance from Centerline of Engine to Alternate Customer Mounting Locations: 152.1 [5.99]

Labels:

- CENTERLINE OF ENGINE
- CENTERLINE OF CRANKSHAFT
- AIR CLEANER
- OIL LEVEL GAGE
- OIL FILLER
- FILLER CAP
- SEA WATER INLET
- HYDRAULIC PUMP DRIVE
- CUSTOMER MOUNTING HOLE
- FUEL FILTER
- ALTERNATE CUSTOMER MOUNTING LOCATIONS

Revision Table:

REV	DESCRIPTION	DATE	BY	CHKD
1	ISSUED FOR PRODUCTION	01/01/00	01	01
2	REVISION	01/01/00	01	01
3	REVISION	01/01/00	01	01
4	REVISION	01/01/00	01	01
5	REVISION	01/01/00	01	01
6	REVISION	01/01/00	01	01
7	REVISION	01/01/00	01	01
8	REVISION	01/01/00	01	01
9	REVISION	01/01/00	01	01
10	REVISION	01/01/00	01	01

Particulars:

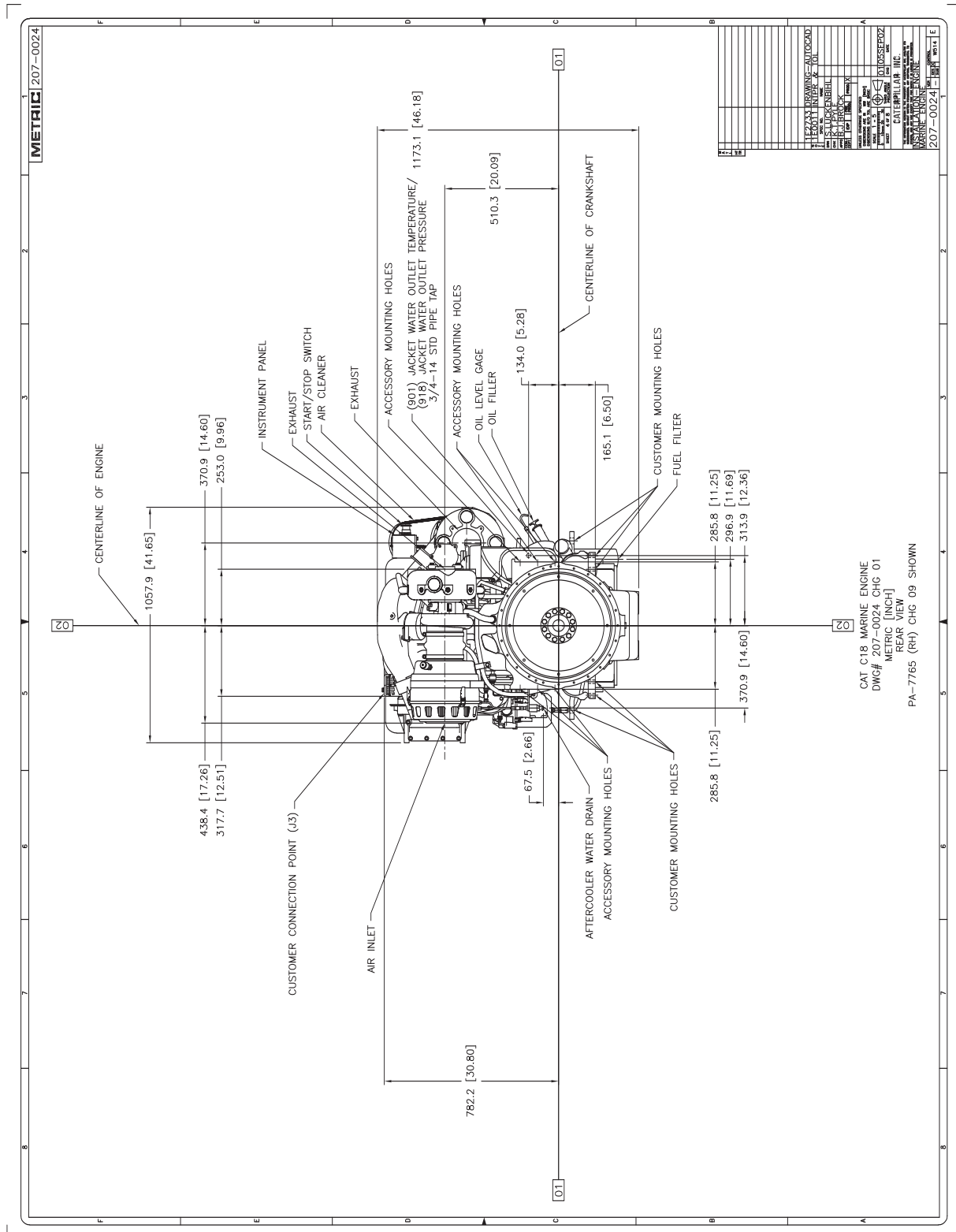
ITEM	DESCRIPTION	QTY	UNIT	REMARKS
1	CAT C18 MARINE ENGINE	1	EA	
2	DWG# 207-0024	1	EA	
3	METRIC [INCH]	1	EA	
4	FRONT VIEW	1	EA	
5	PA-7765 (RH) CHG 09 SHOWN	1	EA	

Notes:

- SEE DRAWING FOR DIMENSIONS AND TOLERANCES.
- SEE DRAWING FOR MATERIAL SPECIFICATIONS.
- SEE DRAWING FOR FINISH SPECIFICATIONS.
- SEE DRAWING FOR ASSEMBLY INSTRUCTIONS.
- SEE DRAWING FOR TESTING INSTRUCTIONS.
- SEE DRAWING FOR MAINTENANCE INSTRUCTIONS.
- SEE DRAWING FOR REPAIR INSTRUCTIONS.
- SEE DRAWING FOR REPLACEMENT PARTS LIST.
- SEE DRAWING FOR WARRANTY INFORMATION.
- SEE DRAWING FOR SAFETY INFORMATION.

[illegible]

General Dimension Drawings — 207-0024



METRIC 207-0024

REAR FACE OF CYLINDER BLOCK

1845.2 [72.65]

97.7 [3.85]

100.0 [3.94]

278.0 [10.94]

293.7 [11.56]

1057.9 [41.65]

02

03

07

08

09

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

126

127

128

129

130

131

132

133

134

135

136

137

138

139

140

141

142

143

144

145

146

147

148

149

150

151

152

153

154

155

156

157

158

159

160

161

162

163

164

165

166

167

168

169

170

171

172

173

174

175

176

177

178

179

180

181

182

183

184

185

186

187

188

189

190

191

192

193

194

195

196

197

198

199

200

201

202

203

204

205

206

207

208

209

210

211

212

213

214

215

216

217

218

219

220

221

222

223

224

225

226

227

228

229

230

231

232

233

234

235

236

237

238

239

240

241

242

243

244

245

246

247

248

249

250

251

252

253

254

255

256

257

258

259

260

261

262

263

264

265

266

267

268

269

270

271

272

273

274

275

276

277

278

279

280

281

282

283

284

285

286

287

288

289

290

291

292

293

294

295

296

297

298

299

300

301

302

303

304

305

306

307

308

309

310

311

312

313

314

315

316

317

318

319

320

321

322

323

324

325

326

327

328

329

330

331

332

333

334

335

336

337

338

339

340

341

342

343

344

345

346

347

348

349

350

351

352

353

354

355

356

357

358

359

360

361

362

363

364

365

366

367

368

369

370

371

372

373

374

375

376

377

378

379

380

381

382

383

384

385

386

387

388

389

390

391

392

393

394

395

396

397

398

399

400

401

402

403

404

405

406

407

408

409

410

411

412

413

414

415

416

417

418

419

420

421

422

423

424

425

426

427

428

429

430

431

432

433

434

435

436

437

438

439

440

441

442

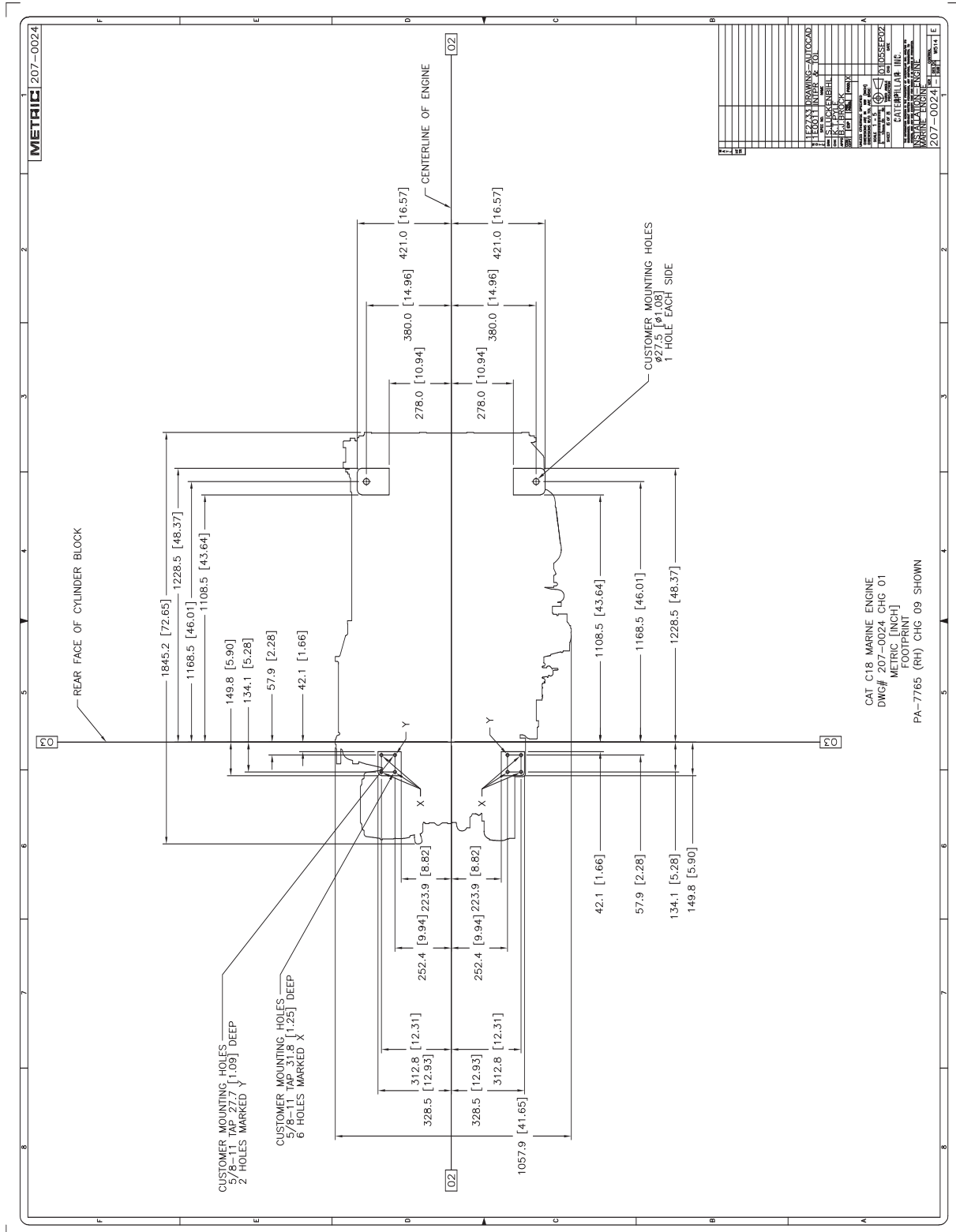
443

444

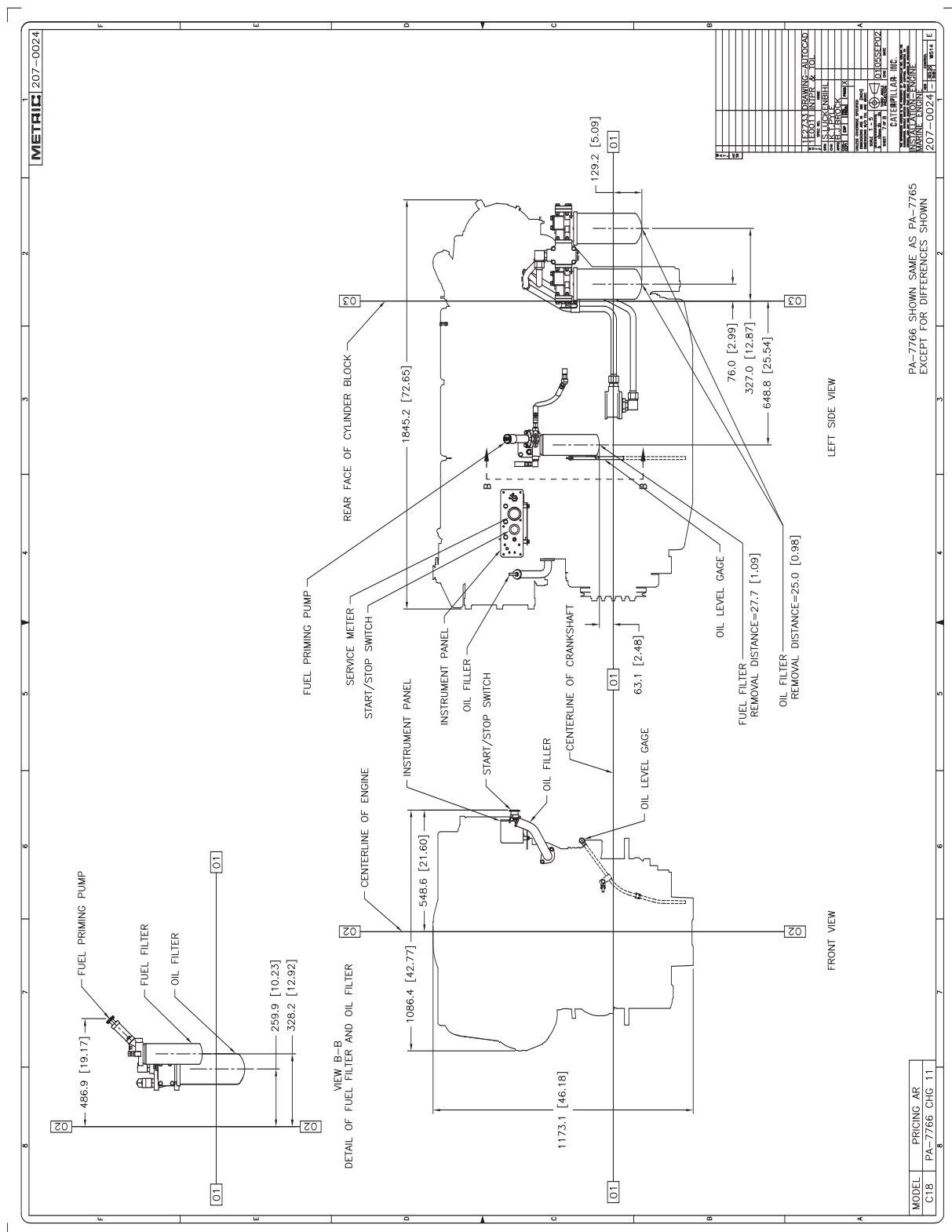
445

446

General Dimension Drawings — 207-0024



General Dimension Drawings — 207-0024



General Dimension Drawings — 207-0024

