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团 体 标 准

T/CSAE XX — 2019

重型商用车发动机测试用典型工况

Typical engine test cycle for heavy-duty commercial vehicles

（征求意见稿）

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前 言

本标准依据GB/T 1.1—2009《标准化工作导则 第1部分：标准的结构和编写》给出的规则编写。

本标准的某些内容可能涉及专利，本标准的发布机构不承担识别这些专利的责任。

本标准提出单位：中国汽车工程学会汽车环境保护技术分会。

本标准归口单位：中国汽车工程学会。

本标准主要起草人：。

本标准为首次制定。

1. 重型商用车发动机测试用典型工况

1 范围

本标准规定了装用压燃式、气体燃料点燃式发动机所排放的气态和颗粒污染物的排放测试工况。

本标准适用于装用压燃式、气体燃料点燃式发动机的M2、M3、N1、N2和N3类最大设计总质量大于3500kg的M2、M3类载客汽车和N2、N3类载货汽车及其发动机的型式检验、生产一致性检查和新生产车排放监督检查。

2 规范性引用文件

下列文件对于本文件的应用是必不可少的。凡是注日期的引用文件，仅注日期的版本适用于本文件。凡是不注日期引用文件，其最新版本（包括所有的修改单）适用于本文件。

GB/T 3730.1汽车和挂车类型的术语和定义

GB/T 15089 机动车辆及挂车分类

GB/T 3730.2 道路车辆 质量 词汇和代码

GB/T 17692 汽车用发动机净功率测试方法

GB/T 27840-2011 重型商用车辆燃料消耗量测试方法

3 术语和定义

GB/T 3730.1、GB/T 15089、GB/T 3730.2、GB/T 17692和GB/T 27840-2011界定的以及下列术语和定义适用于本文件。为了便于使用，以下重复列出了GB/T 3730.1、GB/T 15089、GB/T 3730.2、GB/T 17692和GB/T 27840-2011中的某些术语和定义。

3.1 整车行驶循环 vehicle driving cycle

在特定交通环境下，描述特定车辆（如乘用车、城市客车等）行驶特征的运行工况（车速、功率）。

3.2 基准车型 parent vehicle

从车型系族中选出的，能代表该车型排放特性，并通过型式检验的汽车车型。

3.3 中国重型商用车辆行驶工况 China heavy-duty commercial vehicle test cycle（CHTC）

在中国交通环境下，针对最大设计总质量大于3500kg的M2、M3类载客汽车和N2、N3类载货汽车使用的中国重型商用车行驶工况总称。

3.4 中国货车（GVW>5500kg）行驶工况 China heavy-duty commercial vehicle test cycle-truck（CHTC-HT）

针对最大设计总质量大于5500kg的货车使用的中国汽车行驶工况。

3.5 额定转速(Nerated)

指由生产企业在其销售和服务文件中规定的调速器所允许的最高全负荷转速。

3.6 怠速转速（Neidle）

指发动机无负载运转状态，即离合器处于结合位置、变速器处于空挡位置时的转速。

3.7 归一化转速（Nenorm）

指对发动机实际转速进行规范化处理形成的百分数，其计算公式如下：

Nenorm = (Ne – Neidle)/(Nerated – Neidle)

式中：Ne为发动机实际转速，单位为rpm；Neidle 为发动机怠速转速，单位为rpm；Nerated为发动机额定转速，单位为rpm。

3.8 负荷百分数 percent load

发动机某一转速下能够达到的最大扭矩百分数。

3.9 最大净功率 maximum net power

在发动机全负荷下测得的发动机净功率值。

3.10 净功率 net power

在基准空气条件下，在试验台架上按照GB/T 17692 附录要求，在发动机曲轴末端或等效测得的功率。

3.11 低转速 low speed（nlo）

最大净功率55%所对应的最低发动机转速。

3.12 高转速 high speed （nhi）

最大净功率70%所对应的最高发动机转速。

3.13 最大扭矩转速

发动机发出由生产企业规定的最大扭矩下的发动机转速。

3.14 试验循环 test cycle

指发动机在发动机瞬态工况和稳态工况下按规定归一化转速和负荷百分数进行的连续试验点。

3.15 发动机瞬态试验循环 engine transient test cycle

本标准规定的包含1800个逐秒变换工况的瞬态试验循环。

3.16 发动机稳态试验循环 engine steady state test cycle

本标准规定的包含13个稳态工况的试验循环。

4 工况构成

4.1 发动机瞬态试验循环

发动机瞬态试验循环由随着时间快速变化的归一化转速和负荷百分数连续试验点描述，时长共计1800秒，工况逐秒数据见附录A，试验循环曲线如图1所示。

图1发动机瞬态试验循环

4.2 发动机稳态试验循环

发动机稳态试验循环包含了13个归一化转速和负荷百分数工况。在进行试验时，根据每台发动机的瞬态性能曲线将百分值转化为实际值。发动机按每工况规定的时间运行。工况时长共计1800秒，试验循环如表1所示。

表1 发动机稳态试验循环

|  |  |  |  |
| --- | --- | --- | --- |
| 序号 | 归一化转速（%） | 负荷百分数（%） | 工况时间(s) |
| 1 | 电机驱动 | | 110 |
| 2 | 怠速 | | 250 |
| 3 | 30 | 25 | 195 |
| 4 | 40 | 15 | 385 |
| 5 | 75 | 120 |
| 6 | 45 | 20 | 50 |
| 7 | 35 | 145 |
| 8 | 50 | 30 | 60 |
| 9 | 100 | 50 |
| 10 | 55 | 15 | 60 |
| 11 | 50 | 155 |
| 12 | 75 | 75 |
| 13 | 60 | 10 | 145 |

附录A

（规范性附录）

发动机瞬态试验循环数据

A.1发动机瞬态试验循环数据见表A.1

表A.1发动机瞬态试验循环数据

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 0 | 0.00 | 0.00 | 32 | 0.00 | 0.00 | 64 | 0.00 | 10.20 |
| 1 | 0.00 | 0.00 | 33 | 0.00 | 0.00 | 65 | 0.00 | 9.10 |
| 2 | 0.00 | 0.00 | 34 | 0.00 | 0.00 | 66 | 0.00 | 8.20 |
| 3 | 0.00 | 0.00 | 35 | 0.00 | 0.00 | 67 | 0.00 | 16.50 |
| 4 | 0.00 | 0.00 | 36 | 0.00 | 0.00 | 68 | 0.60 | 4.30 |
| 5 | 0.00 | 0.00 | 37 | 0.00 | 3.40 | 69 | 0.00 | 7.40 |
| 6 | 0.00 | 0.00 | 38 | 0.00 | 38.60 | 70 | 2.10 | 0.90 |
| 7 | 0.00 | 0.00 | 39 | 5.00 | 54.50 | 71 | 0.00 | 0.00 |
| 8 | 0.00 | 0.00 | 40 | 11.70 | 16.40 | 72 | 0.00 | 11.40 |
| 9 | 0.00 | 0.00 | 41 | 14.70 | 4.80 | 73 | 0.60 | 11.10 |
| 10 | 0.00 | 0.00 | 42 | 12.50 | m | 74 | 1.30 | 10.10 |
| 11 | 0.00 | 0.00 | 43 | 7.30 | m | 75 | 3.60 | 3.20 |
| 12 | 0.00 | 0.00 | 44 | 6.50 | m | 76 | 0.00 | 0.00 |
| 13 | 0.00 | 0.00 | 45 | 0.00 | m | 77 | 0.00 | 7.60 |
| 14 | 0.00 | 0.00 | 46 | 0.00 | 1.60 | 78 | 1.30 | 20.50 |
| 15 | 0.00 | 0.00 | 47 | 0.00 | 15.80 | 79 | 9.50 | 16.90 |
| 16 | 0.00 | 0.00 | 48 | 1.30 | 14.70 | 80 | 10.30 | 8.60 |
| 17 | 0.00 | 0.00 | 49 | 0.00 | m | 81 | 12.50 | 7.00 |
| 18 | 0.00 | 0.00 | 50 | 0.00 | m | 82 | 12.50 | 3.40 |
| 19 | 0.00 | 0.00 | 51 | 0.00 | m | 83 | 11.70 | 7.20 |
| 20 | 0.00 | 0.00 | 52 | 0.00 | m | 84 | 14.70 | 16.20 |
| 21 | 0.00 | 0.00 | 53 | 0.00 | 0.00 | 85 | 22.90 | 4.70 |
| 22 | 0.00 | 0.00 | 54 | 0.00 | 0.00 | 86 | 16.20 | m |
| 23 | 0.00 | 0.00 | 55 | 0.00 | 0.00 | 87 | 0.00 | m |
| 24 | 0.00 | 0.00 | 56 | 0.00 | 0.00 | 88 | 0.00 | m |
| 25 | 0.00 | 0.00 | 57 | 0.00 | 0.00 | 89 | 0.00 | 0.00 |
| 26 | 0.00 | 0.00 | 58 | 0.00 | 1.70 | 90 | 0.00 | 0.00 |
| 27 | 0.00 | 0.00 | 59 | 0.00 | 8.20 | 91 | 0.00 | 0.00 |
| 28 | 0.00 | 0.00 | 60 | 0.00 | 31.60 | 92 | 0.00 | 0.00 |
| 29 | 0.00 | 0.00 | 61 | 0.00 | 24.30 | 93 | 0.00 | 0.00 |
| 30 | 0.00 | 0.00 | 62 | 0.00 | m | 94 | 0.00 | 0.00 |
| 31 | 0.00 | 0.00 | 63 | 0.00 | m | 95 | 0.00 | 0.00 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 96 | 0.00 | 0.00 | 133 | 58.20 | m | 170 | 0.00 | 0.00 |
| 97 | 0.00 | 0.00 | 134 | 53.50 | m | 171 | 0.00 | 0.00 |
| 98 | 0.00 | 0.00 | 135 | 50.10 | m | 172 | 0.00 | 0.00 |
| 99 | 0.00 | 0.00 | 136 | 50.10 | 8.80 | 173 | 0.00 | 0.00 |
| 100 | 0.00 | 0.00 | 137 | 51.60 | 8.80 | 174 | 0.00 | 0.00 |
| 101 | 0.00 | 0.00 | 138 | 51.60 | 9.90 | 175 | 0.00 | 0.00 |
| 102 | 0.00 | 0.00 | 139 | 53.50 | 7.80 | 176 | 0.00 | 0.00 |
| 103 | 0.00 | 0.00 | 140 | 52.50 | 4.60 | 177 | 0.00 | 0.00 |
| 104 | 14.00 | 29.30 | 141 | 53.00 | 1.50 | 178 | 0.00 | 0.00 |
| 105 | 19.90 | 4.80 | 142 | 50.60 | m | 179 | 0.00 | 0.00 |
| 106 | 15.50 | 4.60 | 143 | 47.70 | m | 180 | 0.00 | 0.00 |
| 107 | 20.70 | 11.80 | 144 | 40.10 | m | 181 | 0.00 | 0.00 |
| 108 | 24.40 | 27.70 | 145 | 31.10 | m | 182 | 0.00 | 0.00 |
| 109 | 37.50 | 36.10 | 146 | 50.70 | m | 183 | 0.00 | 0.00 |
| 110 | 56.40 | 16.90 | 147 | 42.30 | m | 184 | 0.00 | 0.00 |
| 111 | 62.40 | 11.30 | 148 | 27.70 | m | 185 | 0.00 | 0.00 |
| 112 | 47.80 | 0.10 | 149 | 12.00 | m | 186 | 0.00 | 0.00 |
| 113 | 38.70 | 6.60 | 150 | 5.30 | m | 187 | 0.00 | 19.10 |
| 114 | 26.30 | 25.30 | 151 | 0.00 | m | 188 | 4.30 | 17.00 |
| 115 | 31.10 | 16.90 | 152 | 0.00 | m | 189 | 3.60 | 14.80 |
| 116 | 31.50 | 9.60 | 153 | 0.00 | m | 190 | 10.30 | 15.50 |
| 117 | 33.00 | 4.40 | 154 | 0.00 | 0.00 | 191 | 11.70 | m |
| 118 | 31.10 | m | 155 | 0.00 | 0.00 | 192 | 5.80 | m |
| 119 | 26.30 | m | 156 | 0.00 | 0.00 | 193 | 2.10 | 0.90 |
| 120 | 26.30 | m | 157 | 0.00 | 0.00 | 194 | 2.80 | 16.00 |
| 121 | 22.00 | m | 158 | 0.00 | 0.00 | 195 | 8.80 | 19.40 |
| 122 | 22.90 | 4.40 | 159 | 0.00 | 0.00 | 196 | 13.20 | 12.00 |
| 123 | 21.50 | 6.60 | 160 | 0.00 | 0.00 | 197 | 15.50 | 17.40 |
| 124 | 23.40 | 20.30 | 161 | 0.00 | 0.00 | 198 | 25.90 | 22.20 |
| 125 | 28.20 | 24.20 | 162 | 0.00 | 0.00 | 199 | 36.30 | 18.00 |
| 126 | 32.00 | 20.00 | 163 | 0.00 | 0.00 | 200 | 42.30 | 4.70 |
| 127 | 34.90 | 27.40 | 164 | 0.00 | 0.00 | 201 | 37.80 | m |
| 128 | 42.00 | 40.20 | 165 | 0.00 | 0.00 | 202 | 29.60 | m |
| 129 | 50.60 | 34.00 | 166 | 0.00 | 0.00 | 203 | 33.30 | 6.00 |
| 130 | 54.90 | 23.50 | 167 | 0.00 | 0.00 | 204 | 32.60 | 2.00 |
| 131 | 58.70 | 13.30 | 168 | 0.00 | 0.00 | 205 | 31.80 | 4.00 |
| 132 | 58.20 | 4.80 | 169 | 0.00 | 0.00 | 206 | 33.30 | m |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 207 | 27.40 | m | 244 | 11.00 | m | 281 | 0.00 | 0.00 |
| 208 | 28.90 | 6.00 | 245 | 9.50 | m | 282 | 0.00 | 0.00 |
| 209 | 30.40 | 8.00 | 246 | 4.30 | m | 283 | 0.00 | 0.00 |
| 210 | 34.10 | m | 247 | 1.30 | m | 284 | 0.00 | 0.00 |
| 211 | 23.70 | m | 248 | 0.00 | m | 285 | 0.00 | 0.00 |
| 212 | 25.10 | 8.70 | 249 | 0.00 | m | 286 | 0.00 | 0.00 |
| 213 | 29.60 | 14.00 | 250 | 0.00 | m | 287 | 0.00 | 0.00 |
| 214 | 37.10 | 13.40 | 251 | 0.00 | 3.20 | 288 | 0.00 | 0.00 |
| 215 | 40.80 | 8.70 | 252 | 0.00 | 12.10 | 289 | 0.00 | 0.00 |
| 216 | 43.00 | 5.40 | 253 | 0.00 | 8.80 | 290 | 0.00 | 0.00 |
| 217 | 43.00 | 1.30 | 254 | 0.00 | 0.00 | 291 | 0.00 | 0.00 |
| 218 | 40.80 | 6.70 | 255 | 0.00 | 4.30 | 292 | 0.00 | 0.00 |
| 219 | 46.70 | 10.80 | 256 | 0.00 | 17.50 | 293 | 0.00 | 0.00 |
| 220 | 49.00 | 6.80 | 257 | 0.00 | 9.70 | 294 | 0.00 | 0.00 |
| 221 | 50.50 | 4.10 | 258 | 0.00 | 3.30 | 295 | 0.00 | 0.00 |
| 222 | 49.70 | 2.00 | 259 | 0.00 | 4.20 | 296 | 0.00 | 0.00 |
| 223 | 49.00 | 3.40 | 260 | 0.00 | 8.60 | 297 | 0.00 | 0.00 |
| 224 | 49.70 | 8.10 | 261 | 0.00 | 9.60 | 298 | 0.00 | 0.00 |
| 225 | 54.20 | 7.40 | 262 | 0.00 | 7.60 | 299 | 0.00 | 0.00 |
| 226 | 54.20 | 2.70 | 263 | 0.00 | 8.10 | 300 | 0.00 | 0.00 |
| 227 | 53.40 | 0.70 | 264 | 0.00 | 1.80 | 301 | 0.00 | 0.00 |
| 228 | 51.20 | 1.40 | 265 | 0.00 | 0.70 | 302 | 0.00 | 0.00 |
| 229 | 51.20 | 5.40 | 266 | 0.00 | 4.60 | 303 | 0.00 | 0.00 |
| 230 | 53.40 | 10.10 | 267 | 0.00 | 9.60 | 304 | 0.00 | 0.00 |
| 231 | 58.60 | 9.60 | 268 | 0.00 | 12.40 | 305 | 0.00 | 0.00 |
| 232 | 60.10 | 7.60 | 269 | 0.00 | m | 306 | 0.00 | 0.00 |
| 233 | 45.90 | 10.60 | 270 | 0.00 | m | 307 | 0.00 | 0.00 |
| 234 | 31.80 | 9.90 | 271 | 0.00 | m | 308 | 0.00 | 0.00 |
| 235 | 27.20 | 1.20 | 272 | 0.00 | m | 309 | 0.00 | 0.00 |
| 236 | 24.90 | m | 273 | 0.00 | m | 310 | 0.00 | 0.00 |
| 237 | 39.90 | m | 274 | 0.00 | 0.00 | 311 | 0.00 | 0.00 |
| 238 | 54.20 | m | 275 | 0.00 | 0.00 | 312 | 0.00 | 0.00 |
| 239 | 44.50 | m | 276 | 0.00 | m | 313 | 0.00 | 0.00 |
| 240 | 34.10 | m | 277 | 0.00 | m | 314 | 0.00 | 0.00 |
| 241 | 26.60 | m | 278 | 0.00 | 0.00 | 315 | 0.00 | 0.00 |
| 242 | 19.90 | m | 279 | 0.00 | 0.00 | 316 | 0.00 | 0.00 |
| 243 | 16.20 | m | 280 | 0.00 | 0.00 | 317 | 0.00 | 0.00 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 318 | 0.00 | 0.00 | 355 | 78.70 | 73.30 | 392 | 33.80 | m |
| 319 | 0.00 | 0.00 | 356 | 63.70 | 53.50 | 393 | 31.90 | m |
| 320 | 0.00 | 0.00 | 357 | 46.50 | 40.30 | 394 | 28.80 | m |
| 321 | 0.00 | 0.00 | 358 | 49.60 | 53.20 | 395 | 35.20 | m |
| 322 | 0.00 | 0.00 | 359 | 54.90 | 58.10 | 396 | 43.50 | m |
| 323 | 0.00 | 0.00 | 360 | 59.00 | 29.90 | 397 | 26.80 | m |
| 324 | 0.00 | 0.00 | 361 | 58.70 | m | 398 | 19.30 | m |
| 325 | 0.00 | 0.00 | 362 | 55.50 | m | 399 | 17.00 | m |
| 326 | 0.00 | 0.00 | 363 | 53.10 | m | 400 | 0.00 | m |
| 327 | 0.00 | 0.00 | 364 | 51.80 | 11.40 | 401 | 0.00 | m |
| 328 | 0.00 | 0.00 | 365 | 53.40 | 50.00 | 402 | 0.00 | 0.00 |
| 329 | 0.00 | 0.00 | 366 | 59.60 | 66.10 | 403 | 0.00 | 0.00 |
| 330 | 0.00 | 0.00 | 367 | 63.90 | 56.60 | 404 | 0.00 | 0.00 |
| 331 | 0.00 | 0.00 | 368 | 47.90 | 58.00 | 405 | 0.00 | 0.00 |
| 332 | 0.00 | 0.00 | 369 | 33.80 | 20.40 | 406 | 0.00 | 0.00 |
| 333 | 0.00 | 0.00 | 370 | 26.30 | 0.00 | 407 | 0.00 | 0.00 |
| 334 | 0.00 | 0.00 | 371 | 26.50 | 35.00 | 408 | 0.00 | 0.00 |
| 335 | 0.00 | 0.00 | 372 | 27.60 | 45.40 | 409 | 0.00 | 0.00 |
| 336 | 0.00 | 0.00 | 373 | 28.60 | 30.00 | 410 | 0.00 | 0.00 |
| 337 | 0.00 | 0.00 | 374 | 28.60 | m | 411 | 0.00 | 0.00 |
| 338 | 0.00 | 0.00 | 375 | 27.30 | m | 412 | 0.00 | 0.00 |
| 339 | 0.00 | 0.00 | 376 | 25.90 | m | 413 | 0.00 | 0.00 |
| 340 | 0.00 | 0.00 | 377 | 40.90 | 24.70 | 414 | 0.00 | 0.00 |
| 341 | 0.00 | 0.00 | 378 | 56.90 | 32.60 | 415 | 0.00 | 0.00 |
| 342 | 0.00 | 0.00 | 379 | 71.70 | 49.40 | 416 | 15.40 | 49.80 |
| 343 | 0.00 | 0.00 | 380 | 75.40 | 73.00 | 417 | 25.50 | 60.20 |
| 344 | 0.00 | 0.00 | 381 | 56.00 | 78.60 | 418 | 29.10 | 61.70 |
| 345 | 0.00 | 0.00 | 382 | 37.10 | 28.40 | 419 | 38.70 | 26.40 |
| 346 | 18.40 | 33.30 | 383 | 35.40 | m | 420 | 38.70 | 1.30 |
| 347 | 25.10 | 22.90 | 384 | 34.40 | m | 421 | 36.80 | 34.70 |
| 348 | 40.00 | 37.60 | 385 | 33.30 | m | 422 | 52.00 | 53.80 |
| 349 | 24.90 | 59.20 | 386 | 31.90 | m | 423 | 58.70 | 36.70 |
| 350 | 34.40 | 50.30 | 387 | 30.20 | m | 424 | 44.90 | 43.70 |
| 351 | 45.40 | 29.80 | 388 | 29.20 | m | 425 | 31.90 | 45.80 |
| 352 | 45.40 | 24.60 | 389 | 25.50 | m | 426 | 35.00 | 41.20 |
| 353 | 53.90 | 47.50 | 390 | 35.80 | m | 427 | 38.10 | 46.20 |
| 354 | 64.40 | 63.80 | 391 | 44.00 | m | 428 | 42.20 | 72.30 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 429 | 50.30 | 51.60 | 466 | 31.70 | 20.00 | 503 | 30.90 | m |
| 430 | 50.30 | m | 467 | 31.70 | 17.40 | 504 | 26.70 | m |
| 431 | 47.50 | m | 468 | 31.70 | 20.00 | 505 | 38.50 | m |
| 432 | 46.50 | 1.60 | 469 | 31.90 | 35.40 | 506 | 49.60 | m |
| 433 | 45.90 | 11.30 | 470 | 33.10 | 45.80 | 507 | 39.10 | m |
| 434 | 46.80 | 19.40 | 471 | 34.00 | 35.60 | 508 | 29.40 | m |
| 435 | 47.80 | 38.70 | 472 | 34.40 | 30.50 | 509 | 45.20 | m |
| 436 | 52.40 | 46.70 | 473 | 35.00 | 33.20 | 510 | 28.70 | m |
| 437 | 54.90 | 35.60 | 474 | 35.60 | 35.90 | 511 | 40.20 | m |
| 438 | 57.40 | 32.80 | 475 | 36.40 | 36.00 | 512 | 25.10 | m |
| 439 | 59.30 | 28.30 | 476 | 36.90 | 33.50 | 513 | 10.30 | m |
| 440 | 60.80 | 25.40 | 477 | 37.50 | 33.60 | 514 | 0.00 | m |
| 441 | 62.10 | 15.70 | 478 | 38.10 | 28.50 | 515 | 0.00 | 0.00 |
| 442 | 61.80 | 0.60 | 479 | 38.30 | 20.80 | 516 | 0.00 | 0.00 |
| 443 | 60.20 | 0.00 | 480 | 38.30 | 20.80 | 517 | 0.00 | 0.00 |
| 444 | 57.70 | 5.30 | 481 | 38.50 | 26.00 | 518 | 0.00 | 0.00 |
| 445 | 59.30 | 31.60 | 482 | 38.90 | 26.00 | 519 | 0.00 | 0.00 |
| 446 | 61.80 | 32.30 | 483 | 39.10 | 20.90 | 520 | 0.00 | 0.00 |
| 447 | 63.30 | 31.00 | 484 | 39.10 | 15.70 | 521 | 0.00 | 0.00 |
| 448 | 65.50 | 36.80 | 485 | 38.90 | 13.10 | 522 | 0.00 | 0.00 |
| 449 | 52.90 | 34.30 | 486 | 38.70 | 7.90 | 523 | 0.00 | 0.00 |
| 450 | 39.70 | 29.50 | 487 | 38.10 | 0.10 | 524 | 0.00 | 0.00 |
| 451 | 27.30 | 32.50 | 488 | 37.30 | 2.60 | 525 | 0.00 | 0.00 |
| 452 | 27.80 | 32.50 | 489 | 36.90 | 7.70 | 526 | 0.00 | 0.00 |
| 453 | 28.40 | 29.90 | 490 | 36.50 | m | 527 | 0.00 | 0.00 |
| 454 | 28.80 | 22.20 | 491 | 35.60 | m | 528 | 0.00 | 20.10 |
| 455 | 28.80 | 37.70 | 492 | 35.40 | 12.70 | 529 | 0.00 | 16.00 |
| 456 | 30.40 | 45.50 | 493 | 35.20 | 15.20 | 530 | 3.60 | 35.70 |
| 457 | 30.90 | 27.60 | 494 | 35.20 | 12.70 | 531 | 0.00 | m |
| 458 | 31.10 | 25.00 | 495 | 34.80 | 10.00 | 532 | 0.00 | m |
| 459 | 31.50 | 30.20 | 496 | 34.60 | 12.60 | 533 | 0.00 | m |
| 460 | 32.10 | 22.60 | 497 | 34.40 | 4.90 | 534 | 0.00 | 30.30 |
| 461 | 31.90 | 14.80 | 498 | 33.60 | 4.80 | 535 | 2.10 | 50.80 |
| 462 | 31.90 | 14.80 | 499 | 33.50 | 15.00 | 536 | 18.40 | 19.50 |
| 463 | 31.70 | 17.40 | 500 | 33.50 | 20.20 | 537 | 18.40 | 25.30 |
| 464 | 31.90 | 14.80 | 501 | 33.60 | 17.60 | 538 | 34.80 | 18.70 |
| 465 | 31.50 | 14.80 | 502 | 33.50 | m | 539 | 34.10 | 12.60 |

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| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 540 | 51.20 | 30.20 | 577 | 30.30 | 42.70 | 614 | 36.40 | 54.00 |
| 541 | 63.80 | 17.10 | 578 | 44.20 | 14.80 | 615 | 36.40 | 38.50 |
| 542 | 65.30 | m | 579 | 51.90 | 10.10 | 616 | 37.90 | 85.20 |
| 543 | 46.70 | m | 580 | 50.60 | 30.80 | 617 | 41.40 | 93.60 |
| 544 | 47.50 | 0.00 | 581 | 34.90 | 31.50 | 618 | 43.50 | 68.20 |
| 545 | 46.70 | m | 582 | 35.80 | 24.30 | 619 | 45.10 | 26.90 |
| 546 | 40.80 | 6.00 | 583 | 43.50 | 46.60 | 620 | 44.10 | 34.60 |
| 547 | 49.70 | 18.20 | 584 | 54.40 | 46.50 | 621 | 46.20 | 32.20 |
| 548 | 57.10 | 12.90 | 585 | 62.10 | 19.10 | 622 | 45.10 | 47.70 |
| 549 | 60.10 | 4.90 | 586 | 60.10 | 14.50 | 623 | 48.30 | 100.00 |
| 550 | 58.60 | m | 587 | 46.90 | 54.20 | 624 | 52.00 | 35.40 |
| 551 | 51.90 | 0.00 | 588 | 35.60 | 71.60 | 625 | 49.50 | m |
| 552 | 55.70 | 0.00 | 589 | 40.00 | 49.60 | 626 | 48.70 | m |
| 553 | 54.90 | m | 590 | 43.40 | 41.80 | 627 | 45.80 | m |
| 554 | 35.60 | m | 591 | 46.20 | 12.90 | 628 | 46.20 | 32.20 |
| 555 | 44.50 | 12.10 | 592 | 44.00 | 49.90 | 629 | 46.80 | 14.20 |
| 556 | 45.20 | 6.70 | 593 | 54.00 | 53.20 | 630 | 45.80 | m |
| 557 | 48.20 | 10.10 | 594 | 52.40 | 19.50 | 631 | 43.10 | m |
| 558 | 52.70 | 8.10 | 595 | 55.90 | 19.70 | 632 | 40.40 | m |
| 559 | 53.40 | 6.10 | 596 | 54.30 | m | 633 | 37.90 | m |
| 560 | 55.70 | 8.10 | 597 | 52.10 | m | 634 | 37.50 | 10.40 |
| 561 | 58.60 | 7.60 | 598 | 50.60 | 0.00 | 635 | 37.30 | 28.40 |
| 562 | 60.10 | m | 599 | 50.30 | 14.60 | 636 | 38.30 | 56.90 |
| 563 | 54.20 | m | 600 | 51.50 | 38.70 | 637 | 40.20 | 70.20 |
| 564 | 45.20 | m | 601 | 55.90 | 53.40 | 638 | 42.20 | 60.20 |
| 565 | 31.80 | m | 602 | 59.90 | 48.20 | 639 | 43.30 | 57.80 |
| 566 | 25.10 | 0.00 | 603 | 63.00 | 29.30 | 640 | 45.10 | 60.60 |
| 567 | 38.50 | 0.00 | 604 | 60.30 | 32.90 | 641 | 46.40 | 68.60 |
| 568 | 26.60 | m | 605 | 45.30 | 63.20 | 642 | 48.70 | 55.80 |
| 569 | 31.80 | m | 606 | 27.80 | 37.60 | 643 | 49.10 | 55.90 |
| 570 | 13.20 | m | 607 | 26.90 | 1.50 | 644 | 51.40 | 71.50 |
| 571 | 5.80 | m | 608 | 26.70 | 58.30 | 645 | 31.70 | 52.00 |
| 572 | 5.00 | m | 609 | 30.00 | 86.60 | 646 | 31.70 | 25.60 |
| 573 | 0.00 | 1.70 | 610 | 31.90 | 68.80 | 647 | 31.70 | 25.60 |
| 574 | 2.80 | 4.40 | 611 | 33.80 | 61.30 | 648 | 31.70 | 15.80 |
| 575 | 0.00 | 20.90 | 612 | 35.20 | 15.20 | 649 | 31.30 | m |
| 576 | 15.50 | 52.30 | 613 | 33.60 | 33.00 | 650 | 47.40 | m |

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| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 651 | 40.40 | m | 688 | 0.00 | 0.00 | 725 | 47.50 | 19.50 |
| 652 | 34.40 | m | 689 | 0.00 | 0.00 | 726 | 35.10 | 28.30 |
| 653 | 27.80 | m | 690 | 0.00 | 0.00 | 727 | 27.70 | 25.30 |
| 654 | 41.40 | m | 691 | 0.00 | 0.00 | 728 | 32.00 | 30.40 |
| 655 | 54.90 | m | 692 | 0.00 | 0.00 | 729 | 39.20 | 26.50 |
| 656 | 46.20 | m | 693 | 1.30 | 32.00 | 730 | 41.50 | 14.00 |
| 657 | 43.70 | m | 694 | 10.30 | 17.40 | 731 | 43.00 | 18.20 |
| 658 | 44.00 | m | 695 | 11.00 | 1.70 | 732 | 47.30 | 25.60 |
| 659 | 36.00 | m | 696 | 8.00 | 22.00 | 733 | 36.00 | 45.70 |
| 660 | 50.60 | m | 697 | 22.90 | 21.80 | 734 | 25.40 | 65.50 |
| 661 | 43.90 | m | 698 | 28.10 | 12.70 | 735 | 29.70 | 37.80 |
| 662 | 28.70 | m | 699 | 33.30 | 12.00 | 736 | 31.00 | 25.00 |
| 663 | 47.50 | m | 700 | 37.80 | 8.00 | 737 | 32.80 | 31.50 |
| 664 | 34.10 | m | 701 | 38.50 | 5.30 | 738 | 35.30 | 34.80 |
| 665 | 28.10 | m | 702 | 40.00 | 5.40 | 739 | 37.80 | 41.40 |
| 666 | 10.30 | m | 703 | 40.80 | 16.80 | 740 | 41.50 | 64.20 |
| 667 | 0.00 | m | 704 | 34.90 | 29.40 | 741 | 48.40 | 54.90 |
| 668 | 0.00 | m | 705 | 24.90 | 28.60 | 742 | 50.30 | 29.10 |
| 669 | 0.00 | m | 706 | 30.10 | 26.20 | 743 | 52.10 | 32.30 |
| 670 | 0.00 | 0.00 | 707 | 34.40 | 19.00 | 744 | 54.60 | 34.00 |
| 671 | 0.00 | m | 708 | 36.30 | 15.90 | 745 | 56.80 | 34.30 |
| 672 | 0.00 | m | 709 | 39.20 | 15.00 | 746 | 57.30 | 40.10 |
| 673 | 0.00 | m | 710 | 40.60 | m | 747 | 40.40 | 69.80 |
| 674 | 0.00 | 0.00 | 711 | 30.10 | m | 748 | 25.90 | 79.10 |
| 675 | 0.00 | 0.00 | 712 | 45.90 | m | 749 | 27.10 | 45.40 |
| 676 | 0.00 | 0.00 | 713 | 40.80 | m | 750 | 28.00 | 42.80 |
| 677 | 0.00 | 0.00 | 714 | 22.20 | m | 751 | 29.00 | 45.40 |
| 678 | 0.00 | 0.00 | 715 | 19.90 | 3.40 | 752 | 30.20 | 50.60 |
| 679 | 0.00 | 0.00 | 716 | 22.20 | 1.30 | 753 | 31.50 | 55.90 |
| 680 | 0.00 | 0.00 | 717 | 17.70 | 7.30 | 754 | 33.10 | 76.60 |
| 681 | 0.00 | 0.00 | 718 | 25.90 | 11.40 | 755 | 36.00 | 77.10 |
| 682 | 0.00 | 0.00 | 719 | 26.60 | 6.70 | 756 | 37.50 | 56.80 |
| 683 | 0.00 | 0.00 | 720 | 29.60 | 9.30 | 757 | 38.90 | 57.00 |
| 684 | 0.00 | 0.00 | 721 | 33.30 | 12.00 | 758 | 40.40 | 59.90 |
| 685 | 0.00 | 0.00 | 722 | 39.30 | 12.10 | 759 | 42.00 | 52.40 |
| 686 | 0.00 | 0.00 | 723 | 43.00 | 6.10 | 760 | 42.90 | 42.20 |
| 687 | 0.00 | 0.00 | 724 | 42.30 | 7.40 | 761 | 43.70 | 50.00 |

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| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 762 | 45.30 | 55.50 | 799 | 53.90 | 10.90 | 836 | 46.20 | 17.70 |
| 763 | 46.40 | 45.20 | 800 | 56.30 | 18.40 | 837 | 47.10 | 8.10 |
| 764 | 47.20 | 47.90 | 801 | 40.70 | 22.50 | 838 | 45.90 | 12.90 |
| 765 | 48.50 | 53.20 | 802 | 25.40 | 17.10 | 839 | 47.80 | 24.20 |
| 766 | 49.70 | 48.10 | 803 | 25.40 | 21.90 | 840 | 48.70 | 19.40 |
| 767 | 29.90 | 55.00 | 804 | 27.90 | 28.20 | 841 | 49.60 | 17.80 |
| 768 | 30.50 | 45.20 | 805 | 29.10 | 2.60 | 842 | 50.30 | 13.00 |
| 769 | 30.80 | 58.40 | 806 | 26.60 | 2.50 | 843 | 50.30 | 17.80 |
| 770 | 32.00 | 55.40 | 807 | 27.90 | 10.60 | 844 | 51.80 | 17.90 |
| 771 | 32.20 | 22.40 | 808 | 26.90 | 7.40 | 845 | 51.80 | 13.00 |
| 772 | 31.90 | m | 809 | 27.60 | 12.20 | 846 | 52.40 | 13.10 |
| 773 | 49.10 | m | 810 | 27.60 | 12.20 | 847 | 52.40 | 13.10 |
| 774 | 44.30 | m | 811 | 28.20 | 17.00 | 848 | 53.10 | 21.10 |
| 775 | 38.90 | m | 812 | 29.10 | 28.20 | 849 | 54.60 | 19.60 |
| 776 | 31.70 | m | 813 | 31.90 | 36.20 | 850 | 54.90 | 13.20 |
| 777 | 44.90 | m | 814 | 34.40 | 31.60 | 851 | 55.20 | 18.00 |
| 778 | 56.20 | m | 815 | 36.30 | 18.90 | 852 | 56.50 | 21.30 |
| 779 | 45.00 | m | 816 | 36.30 | 15.70 | 853 | 57.40 | 6.90 |
| 780 | 34.40 | m | 817 | 37.50 | 22.10 | 854 | 55.90 | 2.00 |
| 781 | 29.40 | m | 818 | 38.70 | 23.80 | 855 | 55.90 | 21.30 |
| 782 | 27.20 | m | 819 | 40.30 | 27.10 | 856 | 58.00 | 16.70 |
| 783 | 24.10 | 9.00 | 820 | 42.20 | 7.90 | 857 | 57.10 | 6.90 |
| 784 | 27.20 | 28.30 | 821 | 40.00 | 0.00 | 858 | 57.40 | 11.70 |
| 785 | 27.90 | 9.00 | 822 | 39.70 | 4.60 | 859 | 57.40 | 15.00 |
| 786 | 27.20 | 7.40 | 823 | 39.10 | 1.30 | 860 | 58.30 | 15.10 |
| 787 | 27.60 | 5.80 | 824 | 38.10 | 7.70 | 861 | 58.30 | 15.10 |
| 788 | 26.60 | 0.90 | 825 | 38.70 | 17.40 | 862 | 59.30 | 13.60 |
| 789 | 26.00 | 4.10 | 826 | 39.70 | 17.40 | 863 | 59.00 | 7.00 |
| 790 | 42.70 | 0.00 | 827 | 40.30 | 11.00 | 864 | 58.70 | 23.30 |
| 791 | 59.70 | 1.60 | 828 | 40.00 | 14.20 | 865 | 61.40 | 28.90 |
| 792 | 60.60 | 8.10 | 829 | 41.20 | 15.90 | 866 | 62.10 | 14.00 |
| 793 | 60.60 | 7.00 | 830 | 41.20 | 15.90 | 867 | 62.10 | 15.70 |
| 794 | 61.10 | 4.90 | 831 | 42.50 | 16.00 | 868 | 63.00 | 10.80 |
| 795 | 60.10 | 2.70 | 832 | 42.50 | 16.00 | 869 | 62.10 | 7.30 |
| 796 | 59.70 | m | 833 | 43.70 | 17.60 | 870 | 62.40 | 14.00 |
| 797 | 56.30 | m | 834 | 44.00 | 19.30 | 871 | 62.70 | 15.80 |
| 798 | 53.90 | 0.50 | 835 | 45.60 | 20.90 | 872 | 63.30 | 14.20 |

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| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 873 | 63.30 | 9.10 | 910 | 0.00 | 13.80 | 947 | 43.90 | 35.40 |
| 874 | 63.00 | 7.40 | 911 | 0.00 | 17.10 | 948 | 37.70 | 45.20 |
| 875 | 62.70 | 9.00 | 912 | 0.00 | 5.00 | 949 | 43.00 | 22.40 |
| 876 | 62.70 | 9.00 | 913 | 0.00 | m | 950 | 45.40 | 20.40 |
| 877 | 62.40 | m | 914 | 0.00 | m | 951 | 49.70 | 23.50 |
| 878 | 59.90 | m | 915 | 0.00 | m | 952 | 53.50 | 21.40 |
| 879 | 58.70 | m | 916 | 0.00 | 0.00 | 953 | 56.80 | 17.40 |
| 880 | 57.40 | m | 917 | 0.00 | 0.00 | 954 | 42.70 | 30.50 |
| 881 | 55.50 | m | 918 | 0.00 | 0.00 | 955 | 27.90 | 50.70 |
| 882 | 52.40 | m | 919 | 0.00 | 0.00 | 956 | 31.30 | 33.00 |
| 883 | 51.20 | m | 920 | 0.00 | 0.00 | 957 | 32.50 | 20.30 |
| 884 | 48.10 | m | 921 | 0.00 | 0.00 | 958 | 33.50 | 21.90 |
| 885 | 46.20 | m | 922 | 0.00 | 0.00 | 959 | 35.00 | 34.80 |
| 886 | 44.70 | m | 923 | 0.00 | 0.00 | 960 | 38.40 | 44.60 |
| 887 | 43.10 | m | 924 | 0.00 | 0.00 | 961 | 41.90 | 65.80 |
| 888 | 40.60 | m | 925 | 0.00 | 0.00 | 962 | 49.30 | 66.10 |
| 889 | 37.50 | m | 926 | 0.00 | 0.00 | 963 | 52.70 | 40.30 |
| 890 | 47.50 | m | 927 | 0.00 | 0.00 | 964 | 55.20 | 38.90 |
| 891 | 60.60 | m | 928 | 0.00 | 0.00 | 965 | 58.30 | 24.90 |
| 892 | 52.00 | m | 929 | 0.00 | 0.00 | 966 | 58.00 | 13.40 |
| 893 | 43.90 | m | 930 | 0.00 | 0.00 | 967 | 59.00 | 23.40 |
| 894 | 37.30 | m | 931 | 0.00 | 0.00 | 968 | 60.50 | 43.50 |
| 895 | 27.70 | m | 932 | 0.00 | 0.00 | 969 | 43.20 | 55.50 |
| 896 | 37.40 | m | 933 | 0.00 | 0.00 | 970 | 25.30 | 35.10 |
| 897 | 47.50 | m | 934 | 0.00 | 0.00 | 971 | 25.50 | 27.30 |
| 898 | 33.60 | m | 935 | 0.00 | 0.00 | 972 | 26.10 | 24.70 |
| 899 | 18.40 | m | 936 | 0.00 | 0.00 | 973 | 26.10 | 42.80 |
| 900 | 3.60 | m | 937 | 0.00 | 0.00 | 974 | 28.00 | 22.20 |
| 901 | 5.80 | 0.00 | 938 | 0.00 | 0.00 | 975 | 26.50 | 0.00 |
| 902 | 8.00 | 0.00 | 939 | 0.00 | 0.00 | 976 | 26.10 | 0.00 |
| 903 | 7.30 | m | 940 | 8.00 | 8.10 | 977 | 25.50 | m |
| 904 | 0.00 | m | 941 | 24.10 | 34.40 | 978 | 40.50 | m |
| 905 | 0.00 | m | 942 | 40.00 | 26.80 | 979 | 53.30 | 9.10 |
| 906 | 0.00 | m | 943 | 54.20 | 16.10 | 980 | 65.20 | 19.60 |
| 907 | 0.00 | 2.60 | 944 | 54.20 | 0.00 | 981 | 64.90 | 2.50 |
| 908 | 0.00 | 6.00 | 945 | 50.50 | 4.10 | 982 | 63.60 | 10.80 |
| 909 | 0.00 | 9.20 | 946 | 54.90 | 14.80 | 983 | 64.90 | 17.80 |

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| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 984 | 64.90 | 7.60 | 1021 | 45.90 | 59.20 | 1058 | 33.50 | 49.10 |
| 985 | 64.20 | 2.40 | 1022 | 46.30 | 59.30 | 1059 | 34.10 | 55.90 |
| 986 | 63.30 | 4.10 | 1023 | 47.20 | 66.10 | 1060 | 34.90 | 62.70 |
| 987 | 63.00 | 17.50 | 1024 | 48.00 | 56.30 | 1061 | 35.80 | 46.40 |
| 988 | 64.60 | 28.00 | 1025 | 48.40 | 66.40 | 1062 | 35.80 | 20.00 |
| 989 | 62.10 | 37.20 | 1026 | 49.60 | 56.70 | 1063 | 35.50 | 26.50 |
| 990 | 46.70 | 47.50 | 1027 | 49.60 | 23.50 | 1064 | 35.80 | 29.90 |
| 991 | 28.00 | 63.40 | 1028 | 49.30 | 33.40 | 1065 | 35.60 | 10.10 |
| 992 | 30.20 | 71.20 | 1029 | 49.80 | 36.80 | 1066 | 35.00 | 0.00 |
| 993 | 32.10 | 53.40 | 1030 | 49.60 | 16.80 | 1067 | 34.30 | 9.70 |
| 994 | 32.90 | 48.30 | 1031 | 49.20 | 3.40 | 1068 | 34.30 | 26.20 |
| 995 | 34.40 | 61.40 | 1032 | 48.40 | m | 1069 | 34.30 | 36.10 |
| 996 | 36.20 | 69.40 | 1033 | 47.20 | m | 1070 | 34.70 | 65.90 |
| 997 | 38.30 | 90.40 | 1034 | 46.80 | m | 1071 | 36.10 | 66.30 |
| 998 | 41.60 | 100.00 | 1035 | 45.70 | m | 1072 | 36.50 | 43.30 |
| 999 | 44.50 | 68.30 | 1036 | 45.00 | m | 1073 | 36.80 | 33.50 |
| 1000 | 45.30 | 42.50 | 1037 | 44.40 | 0.00 | 1074 | 36.80 | 43.40 |
| 1001 | 46.20 | 42.60 | 1038 | 43.90 | m | 1075 | 37.60 | 63.40 |
| 1002 | 47.00 | 50.50 | 1039 | 42.70 | m | 1076 | 38.50 | 50.50 |
| 1003 | 48.50 | 50.60 | 1040 | 41.40 | m | 1077 | 38.60 | 47.20 |
| 1004 | 49.30 | 55.90 | 1041 | 40.60 | m | 1078 | 39.40 | 57.30 |
| 1005 | 30.40 | 84.70 | 1042 | 39.80 | m | 1079 | 40.00 | 57.50 |
| 1006 | 31.60 | 71.80 | 1043 | 39.10 | m | 1080 | 40.80 | 51.10 |
| 1007 | 32.50 | 62.10 | 1044 | 38.50 | m | 1081 | 41.10 | 51.20 |
| 1008 | 33.20 | 75.40 | 1045 | 37.70 | m | 1082 | 41.80 | 34.80 |
| 1009 | 34.70 | 79.10 | 1046 | 37.00 | m | 1083 | 41.40 | 18.10 |
| 1010 | 35.60 | 66.20 | 1047 | 35.50 | m | 1084 | 41.40 | 34.70 |
| 1011 | 36.50 | 76.30 | 1048 | 34.70 | m | 1085 | 41.70 | 38.10 |
| 1012 | 37.90 | 73.40 | 1049 | 34.30 | 6.40 | 1086 | 41.80 | 28.20 |
| 1013 | 38.60 | 53.80 | 1050 | 33.80 | 3.00 | 1087 | 41.70 | 21.50 |
| 1014 | 39.10 | 60.60 | 1051 | 33.20 | 2.90 | 1088 | 41.50 | 21.40 |
| 1015 | 40.20 | 70.80 | 1052 | 32.80 | 12.70 | 1089 | 41.40 | 31.40 |
| 1016 | 41.10 | 61.10 | 1053 | 32.60 | 25.80 | 1090 | 41.70 | 31.40 |
| 1017 | 41.70 | 61.30 | 1054 | 32.80 | 35.80 | 1091 | 41.50 | 14.80 |
| 1018 | 42.60 | 88.20 | 1055 | 33.10 | 29.20 | 1092 | 41.10 | 18.00 |
| 1019 | 44.40 | 82.00 | 1056 | 32.90 | 25.90 | 1093 | 41.10 | 24.60 |
| 1020 | 45.00 | 62.30 | 1057 | 33.10 | 39.10 | 1094 | 40.90 | 24.60 |

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| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 1095 | 40.90 | 34.60 | 1132 | 45.10 | 15.70 | 1169 | 50.60 | 34.00 |
| 1096 | 41.20 | 38.00 | 1133 | 44.80 | 15.60 | 1170 | 40.80 | 58.60 |
| 1097 | 41.40 | 34.70 | 1134 | 44.50 | 8.90 | 1171 | 30.70 | 66.60 |
| 1098 | 41.50 | 31.40 | 1135 | 43.90 | m | 1172 | 33.80 | 49.10 |
| 1099 | 41.50 | 34.70 | 1136 | 43.30 | 0.00 | 1173 | 38.40 | 55.90 |
| 1100 | 41.80 | 34.80 | 1137 | 43.20 | m | 1174 | 42.80 | 59.50 |
| 1101 | 41.80 | 11.60 | 1138 | 42.00 | m | 1175 | 48.10 | 53.20 |
| 1102 | 41.10 | 11.40 | 1139 | 39.70 | m | 1176 | 51.20 | 35.50 |
| 1103 | 41.10 | 34.60 | 1140 | 37.30 | m | 1177 | 53.10 | 41.90 |
| 1104 | 41.40 | 34.70 | 1141 | 34.90 | m | 1178 | 57.40 | 58.70 |
| 1105 | 41.40 | 41.30 | 1142 | 32.30 | m | 1179 | 62.40 | 59.20 |
| 1106 | 42.00 | 44.80 | 1143 | 32.20 | 0.00 | 1180 | 66.40 | 80.20 |
| 1107 | 42.10 | 41.50 | 1144 | 32.00 | 0.00 | 1181 | 68.80 | 84.50 |
| 1108 | 42.60 | 45.00 | 1145 | 31.40 | m | 1182 | 54.50 | 62.00 |
| 1109 | 42.90 | 35.10 | 1146 | 29.90 | m | 1183 | 38.90 | 38.20 |
| 1110 | 42.90 | 38.40 | 1147 | 49.50 | 19.70 | 1184 | 34.00 | 30.50 |
| 1111 | 43.30 | 41.90 | 1148 | 50.70 | 81.80 | 1185 | 35.00 | 61.50 |
| 1112 | 43.50 | 35.20 | 1149 | 51.10 | 74.20 | 1186 | 37.30 | 56.70 |
| 1113 | 43.60 | 45.30 | 1150 | 35.90 | 25.00 | 1187 | 37.90 | 54.20 |
| 1114 | 44.20 | 42.10 | 1151 | 32.60 | 6.10 | 1188 | 40.00 | 59.80 |
| 1115 | 44.20 | 45.40 | 1152 | 32.00 | 5.90 | 1189 | 41.00 | 39.30 |
| 1116 | 45.00 | 42.30 | 1153 | 31.70 | 15.80 | 1190 | 41.60 | 44.50 |
| 1117 | 44.80 | 32.30 | 1154 | 31.60 | m | 1191 | 42.90 | 60.30 |
| 1118 | 45.10 | 39.00 | 1155 | 50.30 | m | 1192 | 44.70 | 39.80 |
| 1119 | 45.30 | 39.00 | 1156 | 47.60 | m | 1193 | 44.50 | 60.50 |
| 1120 | 45.60 | 49.10 | 1157 | 42.50 | m | 1194 | 47.80 | 84.30 |
| 1121 | 46.20 | 35.90 | 1158 | 37.90 | m | 1195 | 49.30 | 63.60 |
| 1122 | 45.90 | 25.90 | 1159 | 31.30 | m | 1196 | 30.20 | 64.90 |
| 1123 | 46.00 | 29.20 | 1160 | 43.90 | m | 1197 | 30.70 | 35.30 |
| 1124 | 45.90 | 29.20 | 1161 | 52.40 | m | 1198 | 30.70 | 28.70 |
| 1125 | 46.00 | 35.90 | 1162 | 40.00 | m | 1199 | 30.80 | 45.20 |
| 1126 | 46.20 | 26.00 | 1163 | 27.90 | m | 1200 | 31.60 | 61.90 |
| 1127 | 45.90 | 22.60 | 1164 | 36.10 | m | 1201 | 32.50 | 45.60 |
| 1128 | 45.90 | 32.50 | 1165 | 43.90 | m | 1202 | 32.50 | 25.80 |
| 1129 | 46.00 | 25.90 | 1166 | 43.00 | 0.30 | 1203 | 32.50 | 39.00 |
| 1130 | 45.70 | 15.90 | 1167 | 41.50 | 9.80 | 1204 | 33.10 | 52.30 |
| 1131 | 45.40 | 15.80 | 1168 | 44.90 | 25.60 | 1205 | 33.70 | 49.20 |

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| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 1206 | 34.10 | 42.70 | 1243 | 51.60 | 23.90 | 1280 | 43.90 | m |
| 1207 | 34.40 | 42.80 | 1244 | 51.50 | 23.90 | 1281 | 43.30 | 0.00 |
| 1208 | 34.90 | 42.90 | 1245 | 41.30 | 52.70 | 1282 | 42.90 | 0.00 |
| 1209 | 35.20 | 56.10 | 1246 | 29.50 | 83.40 | 1283 | 42.00 | m |
| 1210 | 36.20 | 56.40 | 1247 | 29.90 | 66.30 | 1284 | 41.40 | m |
| 1211 | 36.50 | 36.70 | 1248 | 30.20 | 49.10 | 1285 | 38.10 | m |
| 1212 | 36.70 | 36.70 | 1249 | 30.20 | 36.10 | 1286 | 36.20 | m |
| 1213 | 37.00 | 43.40 | 1250 | 30.10 | 5.70 | 1287 | 29.20 | m |
| 1214 | 37.40 | 3.90 | 1251 | 29.20 | m | 1288 | 44.60 | m |
| 1215 | 35.90 | m | 1252 | 41.30 | m | 1289 | 61.10 | m |
| 1216 | 35.20 | m | 1253 | 48.70 | m | 1290 | 55.20 | m |
| 1217 | 32.60 | m | 1254 | 46.50 | m | 1291 | 44.30 | m |
| 1218 | 31.70 | m | 1255 | 45.90 | m | 1292 | 32.80 | m |
| 1219 | 30.80 | m | 1256 | 44.80 | m | 1293 | 39.20 | m |
| 1220 | 48.30 | m | 1257 | 43.60 | m | 1294 | 39.60 | m |
| 1221 | 50.30 | 14.60 | 1258 | 40.30 | m | 1295 | 30.20 | m |
| 1222 | 49.90 | 4.20 | 1259 | 38.80 | m | 1296 | 22.90 | m |
| 1223 | 49.10 | 27.40 | 1260 | 38.80 | m | 1297 | 7.60 | m |
| 1224 | 50.50 | 45.60 | 1261 | 36.50 | m | 1298 | 0.00 | m |
| 1225 | 51.10 | 63.70 | 1262 | 33.70 | m | 1299 | 0.00 | m |
| 1226 | 53.80 | 79.40 | 1263 | 31.00 | m | 1300 | 0.00 | 0.00 |
| 1227 | 55.50 | 64.30 | 1264 | 49.50 | m | 1301 | 0.00 | 0.00 |
| 1228 | 57.00 | 59.70 | 1265 | 48.00 | m | 1302 | 0.00 | 0.00 |
| 1229 | 58.40 | 89.10 | 1266 | 46.60 | m | 1303 | 0.00 | 0.00 |
| 1230 | 62.10 | 100.00 | 1267 | 45.30 | 0.00 | 1304 | 0.00 | 0.00 |
| 1231 | 54.60 | 83.60 | 1268 | 45.30 | 0.00 | 1305 | 0.00 | 0.00 |
| 1232 | 42.00 | 88.00 | 1269 | 45.10 | 0.00 | 1306 | 0.00 | 0.00 |
| 1233 | 43.50 | 88.40 | 1270 | 43.90 | m | 1307 | 0.00 | 0.00 |
| 1234 | 44.70 | 75.50 | 1271 | 42.90 | 21.40 | 1308 | 0.00 | 0.00 |
| 1235 | 45.60 | 72.40 | 1272 | 44.10 | 37.20 | 1309 | 0.00 | 0.00 |
| 1236 | 46.60 | 95.90 | 1273 | 44.30 | 21.60 | 1310 | 0.00 | 0.00 |
| 1237 | 48.60 | 100.00 | 1274 | 44.30 | 29.40 | 1311 | 0.00 | 0.00 |
| 1238 | 49.80 | 73.30 | 1275 | 45.10 | 32.10 | 1312 | 0.00 | 0.00 |
| 1239 | 50.50 | 66.80 | 1276 | 45.30 | 24.30 | 1313 | 0.00 | 0.00 |
| 1240 | 51.50 | 53.70 | 1277 | 45.40 | 27.00 | 1314 | 0.00 | 0.00 |
| 1241 | 51.60 | 37.20 | 1278 | 45.80 | 11.50 | 1315 | 0.00 | 0.00 |
| 1242 | 51.80 | 30.60 | 1279 | 44.90 | m | 1316 | 0.00 | 0.00 |

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| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 1317 | 0.00 | 0.00 | 1354 | 31.30 | 27.60 | 1391 | 52.90 | 9.90 |
| 1318 | 0.00 | 0.00 | 1355 | 31.70 | 26.40 | 1392 | 52.90 | 14.70 |
| 1319 | 0.00 | 0.00 | 1356 | 32.00 | 29.00 | 1393 | 53.80 | 18.70 |
| 1320 | 0.00 | 0.00 | 1357 | 32.60 | 35.50 | 1394 | 54.60 | 16.30 |
| 1321 | 0.00 | 0.00 | 1358 | 33.40 | 39.40 | 1395 | 55.10 | 16.40 |
| 1322 | 0.00 | 0.00 | 1359 | 34.20 | 34.40 | 1396 | 55.90 | 18.00 |
| 1323 | 0.00 | 0.00 | 1360 | 34.60 | 38.30 | 1397 | 56.60 | 18.90 |
| 1324 | 0.00 | 0.00 | 1361 | 35.80 | 61.60 | 1398 | 57.60 | 15.00 |
| 1325 | 0.00 | 0.00 | 1362 | 37.90 | 72.30 | 1399 | 57.60 | 19.90 |
| 1326 | 0.00 | 0.00 | 1363 | 39.80 | 77.80 | 1400 | 59.40 | 35.70 |
| 1327 | 0.00 | 0.00 | 1364 | 42.30 | 71.80 | 1401 | 62.40 | 42.50 |
| 1328 | 0.00 | 0.00 | 1365 | 43.80 | 38.40 | 1402 | 65.30 | 50.40 |
| 1329 | 0.00 | 0.00 | 1366 | 43.80 | 19.00 | 1403 | 69.50 | 58.30 |
| 1330 | 0.00 | 0.00 | 1367 | 43.80 | 19.00 | 1404 | 73.60 | 57.40 |
| 1331 | 0.00 | 0.00 | 1368 | 43.80 | 19.00 | 1405 | 77.30 | 66.60 |
| 1332 | 0.00 | 0.00 | 1369 | 43.80 | 15.10 | 1406 | 82.60 | 90.50 |
| 1333 | 0.00 | 0.00 | 1370 | 43.50 | m | 1407 | 89.70 | 100.00 |
| 1334 | 0.00 | 0.00 | 1371 | 41.90 | m | 1408 | 97.50 | 100.00 |
| 1335 | 10.90 | 7.40 | 1372 | 39.80 | m | 1409 | 98.00 | 100.00 |
| 1336 | 25.90 | 31.90 | 1373 | 36.90 | m | 1410 | 100.00 | 100.00 |
| 1337 | 38.50 | 21.40 | 1374 | 33.80 | m | 1411 | 98.00 | 100.00 |
| 1338 | 46.00 | 15.50 | 1375 | 32.90 | m | 1412 | 84.90 | 68.20 |
| 1339 | 51.90 | 16.50 | 1376 | 32.90 | 0.00 | 1413 | 69.10 | 43.50 |
| 1340 | 60.50 | 27.00 | 1377 | 32.90 | 0.00 | 1414 | 54.70 | 70.10 |
| 1341 | 53.90 | 56.50 | 1378 | 32.90 | m | 1415 | 39.10 | 95.30 |
| 1342 | 46.60 | 63.50 | 1379 | 32.20 | m | 1416 | 40.80 | 92.60 |
| 1343 | 60.10 | 63.90 | 1380 | 31.50 | m | 1417 | 42.00 | 81.40 |
| 1344 | 48.10 | 71.40 | 1381 | 30.80 | 0.00 | 1418 | 43.20 | 78.40 |
| 1345 | 36.30 | 39.70 | 1382 | 30.80 | 0.00 | 1419 | 44.30 | 77.00 |
| 1346 | 38.00 | 35.00 | 1383 | 30.40 | m | 1420 | 45.40 | 64.00 |
| 1347 | 41.20 | 46.50 | 1384 | 28.00 | m | 1421 | 45.90 | 52.50 |
| 1348 | 45.10 | 52.40 | 1385 | 26.60 | m | 1422 | 46.40 | 70.90 |
| 1349 | 49.50 | 70.10 | 1386 | 40.30 | m | 1423 | 47.80 | 96.20 |
| 1350 | 56.80 | 97.20 | 1387 | 55.50 | m | 1424 | 49.40 | 98.10 |
| 1351 | 42.80 | 100.00 | 1388 | 52.90 | m | 1425 | 50.90 | 88.40 |
| 1352 | 29.40 | 98.20 | 1389 | 52.90 | 0.00 | 1426 | 41.50 | 100.00 |
| 1353 | 30.90 | 43.00 | 1390 | 52.90 | 9.90 | 1427 | 30.10 | 96.60 |

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| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 1428 | 30.90 | 90.40 | 1465 | 50.20 | 0.00 | 1502 | 32.20 | m |
| 1429 | 31.40 | 64.70 | 1466 | 49.80 | m | 1503 | 31.50 | m |
| 1430 | 31.50 | 66.90 | 1467 | 49.00 | m | 1504 | 31.50 | m |
| 1431 | 32.10 | 97.50 | 1468 | 48.20 | m | 1505 | 31.50 | m |
| 1432 | 33.00 | 100.00 | 1469 | 47.60 | m | 1506 | 31.50 | 41.00 |
| 1433 | 34.00 | 100.00 | 1470 | 47.10 | m | 1507 | 31.50 | 45.30 |
| 1434 | 34.80 | 85.80 | 1471 | 46.60 | m | 1508 | 31.60 | 64.80 |
| 1435 | 35.20 | 81.70 | 1472 | 46.20 | m | 1509 | 32.10 | 82.30 |
| 1436 | 35.80 | 88.50 | 1473 | 45.60 | m | 1510 | 32.70 | 95.60 |
| 1437 | 36.40 | 84.90 | 1474 | 44.60 | m | 1511 | 47.60 | 84.20 |
| 1438 | 36.90 | 85.80 | 1475 | 43.80 | m | 1512 | 58.80 | 100.00 |
| 1439 | 37.70 | 86.60 | 1476 | 43.30 | 1.30 | 1513 | 60.80 | 100.00 |
| 1440 | 52.20 | 87.60 | 1477 | 42.60 | 7.50 | 1514 | 48.50 | 86.80 |
| 1441 | 65.80 | 88.20 | 1478 | 42.30 | 20.40 | 1515 | 37.70 | 76.60 |
| 1442 | 66.80 | 87.90 | 1479 | 41.90 | 20.20 | 1516 | 38.20 | 74.70 |
| 1443 | 67.90 | 87.50 | 1480 | 41.60 | 26.60 | 1517 | 38.60 | 57.50 |
| 1444 | 69.70 | 86.70 | 1481 | 41.40 | 30.80 | 1518 | 38.60 | 44.50 |
| 1445 | 71.40 | 84.80 | 1482 | 41.20 | 32.90 | 1519 | 38.60 | m |
| 1446 | 73.20 | 85.80 | 1483 | 41.10 | 30.60 | 1520 | 38.60 | m |
| 1447 | 74.80 | 86.20 | 1484 | 40.80 | m | 1521 | 38.60 | m |
| 1448 | 76.40 | 86.70 | 1485 | 40.30 | m | 1522 | 38.60 | m |
| 1449 | 77.80 | 87.80 | 1486 | 40.00 | 23.50 | 1523 | 38.60 | 51.00 |
| 1450 | 79.00 | 87.80 | 1487 | 39.70 | 23.40 | 1524 | 38.70 | 55.50 |
| 1451 | 79.90 | 86.60 | 1488 | 39.40 | 27.60 | 1525 | 38.80 | 49.00 |
| 1452 | 80.10 | 87.10 | 1489 | 39.20 | 34.00 | 1526 | 38.80 | 44.70 |
| 1453 | 66.10 | 88.70 | 1490 | 39.10 | 40.50 | 1527 | 38.80 | 72.90 |
| 1454 | 52.40 | 93.00 | 1491 | 39.10 | 44.80 | 1528 | 39.60 | 90.80 |
| 1455 | 52.60 | 80.10 | 1492 | 39.10 | 42.70 | 1529 | 40.40 | 100.00 |
| 1456 | 53.10 | 82.50 | 1493 | 39.10 | 40.40 | 1530 | 41.40 | 100.00 |
| 1457 | 53.40 | 63.10 | 1494 | 39.00 | 40.40 | 1531 | 42.50 | 92.40 |
| 1458 | 53.40 | 52.30 | 1495 | 39.00 | 42.60 | 1532 | 43.00 | 68.70 |
| 1459 | 53.40 | 52.30 | 1496 | 39.00 | 23.00 | 1533 | 43.00 | 53.50 |
| 1460 | 53.40 | 52.30 | 1497 | 38.40 | m | 1534 | 43.10 | 57.90 |
| 1461 | 53.40 | 30.60 | 1498 | 36.50 | m | 1535 | 43.30 | 71.10 |
| 1462 | 52.90 | m | 1499 | 34.60 | m | 1536 | 43.80 | 95.40 |
| 1463 | 51.70 | m | 1500 | 33.80 | m | 1537 | 44.60 | 95.80 |
| 1464 | 50.60 | m | 1501 | 33.20 | m | 1538 | 45.00 | 72.10 |

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| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 1539 | 45.20 | 72.10 | 1576 | 57.00 | m | 1613 | 55.80 | 71.20 |
| 1540 | 45.70 | 85.50 | 1577 | 56.40 | m | 1614 | 55.90 | 60.40 |
| 1541 | 46.20 | 77.00 | 1578 | 56.00 | 36.50 | 1615 | 56.00 | 56.10 |
| 1542 | 46.40 | 64.10 | 1579 | 56.00 | 51.70 | 1616 | 56.00 | 53.90 |
| 1543 | 46.60 | 70.70 | 1580 | 56.00 | 49.60 | 1617 | 56.00 | 53.90 |
| 1544 | 47.00 | 75.30 | 1581 | 55.80 | 49.50 | 1618 | 56.00 | 51.70 |
| 1545 | 47.30 | 66.70 | 1582 | 55.80 | 53.80 | 1619 | 55.90 | 47.30 |
| 1546 | 47.50 | 64.60 | 1583 | 55.80 | 53.80 | 1620 | 55.80 | m |
| 1547 | 47.70 | 88.70 | 1584 | 55.80 | 40.80 | 1621 | 55.10 | m |
| 1548 | 48.50 | 100.00 | 1585 | 55.50 | 18.80 | 1622 | 54.20 | 9.30 |
| 1549 | 49.30 | 100.00 | 1586 | 54.90 | 22.80 | 1623 | 53.90 | 33.10 |
| 1550 | 49.90 | 98.40 | 1587 | 54.70 | 44.40 | 1624 | 53.70 | 30.80 |
| 1551 | 50.60 | 90.00 | 1588 | 54.70 | 53.00 | 1625 | 53.40 | 34.90 |
| 1552 | 51.00 | 94.50 | 1589 | 54.70 | 53.00 | 1626 | 53.30 | m |
| 1553 | 51.80 | 100.00 | 1590 | 54.70 | 53.00 | 1627 | 52.50 | m |
| 1554 | 52.60 | 100.00 | 1591 | 54.70 | 55.20 | 1628 | 51.60 | 10.10 |
| 1555 | 53.10 | 97.70 | 1592 | 54.70 | 55.30 | 1629 | 51.40 | 25.10 |
| 1556 | 53.80 | 85.10 | 1593 | 54.70 | 53.10 | 1630 | 51.00 | 29.30 |
| 1557 | 54.00 | 63.50 | 1594 | 54.70 | 53.10 | 1631 | 50.80 | 40.10 |
| 1558 | 54.10 | 61.40 | 1595 | 54.70 | 53.10 | 1632 | 50.70 | 35.70 |
| 1559 | 54.20 | 63.60 | 1596 | 54.70 | 46.60 | 1633 | 50.40 | 18.10 |
| 1560 | 54.40 | 70.20 | 1597 | 54.60 | 35.60 | 1634 | 49.80 | 15.60 |
| 1561 | 54.70 | 68.20 | 1598 | 54.30 | 31.10 | 1635 | 49.50 | 30.70 |
| 1562 | 54.80 | 57.50 | 1599 | 54.00 | 30.90 | 1636 | 49.30 | m |
| 1563 | 54.80 | 55.30 | 1600 | 53.70 | 37.30 | 1637 | 48.80 | m |
| 1564 | 54.90 | 72.70 | 1601 | 53.60 | 48.00 | 1638 | 48.30 | 32.30 |
| 1565 | 55.30 | 75.20 | 1602 | 53.60 | 52.40 | 1639 | 48.30 | 49.70 |
| 1566 | 55.40 | 66.60 | 1603 | 53.60 | 52.40 | 1640 | 48.30 | 47.60 |
| 1567 | 55.70 | 74.20 | 1604 | 53.60 | 56.70 | 1641 | 48.30 | 47.50 |
| 1568 | 56.20 | 86.70 | 1605 | 53.70 | 56.80 | 1642 | 48.30 | 51.90 |
| 1569 | 56.90 | 84.20 | 1606 | 53.70 | 63.30 | 1643 | 48.30 | 49.70 |
| 1570 | 57.50 | 77.10 | 1607 | 54.00 | 74.30 | 1644 | 48.30 | 47.50 |
| 1571 | 57.50 | 75.20 | 1608 | 54.30 | 68.00 | 1645 | 48.30 | 45.40 |
| 1572 | 57.50 | 63.20 | 1609 | 54.40 | 59.40 | 1646 | 48.10 | 45.30 |
| 1573 | 57.50 | 57.20 | 1610 | 54.50 | 70.30 | 1647 | 48.10 | 47.50 |
| 1574 | 57.50 | 55.20 | 1611 | 54.90 | 90.10 | 1648 | 48.10 | 34.40 |
| 1575 | 57.50 | 35.40 | 1612 | 55.40 | 88.30 | 1649 | 47.70 | 21.10 |

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| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 1650 | 47.30 | 25.20 | 1687 | 40.70 | 62.20 | 1724 | 52.10 | 70.90 |
| 1651 | 47.10 | 33.90 | 1688 | 40.80 | 65.40 | 1725 | 52.60 | 67.80 |
| 1652 | 46.90 | 29.40 | 1689 | 41.20 | 63.40 | 1726 | 52.70 | 64.60 |
| 1653 | 46.60 | 22.70 | 1690 | 41.30 | 59.10 | 1727 | 52.80 | 58.50 |
| 1654 | 46.20 | 31.20 | 1691 | 41.50 | 63.60 | 1728 | 52.90 | 54.10 |
| 1655 | 46.10 | 39.90 | 1692 | 41.80 | 61.50 | 1729 | 52.90 | 56.30 |
| 1656 | 46.00 | 31.10 | 1693 | 41.90 | 52.90 | 1730 | 53.00 | 56.40 |
| 1657 | 45.70 | m | 1694 | 41.90 | 52.90 | 1731 | 53.00 | 52.00 |
| 1658 | 45.30 | m | 1695 | 42.10 | 53.00 | 1732 | 53.00 | 52.00 |
| 1659 | 45.20 | m | 1696 | 42.10 | 48.60 | 1733 | 53.00 | 47.70 |
| 1660 | 45.10 | m | 1697 | 42.20 | 50.80 | 1734 | 52.90 | 45.50 |
| 1661 | 44.40 | m | 1698 | 42.20 | 48.70 | 1735 | 52.80 | 49.80 |
| 1662 | 43.30 | m | 1699 | 42.20 | 46.50 | 1736 | 52.80 | 49.80 |
| 1663 | 43.10 | m | 1700 | 42.20 | 48.70 | 1737 | 52.70 | 47.60 |
| 1664 | 43.10 | 38.30 | 1701 | 42.30 | 50.90 | 1738 | 52.70 | 49.70 |
| 1665 | 42.90 | 38.20 | 1702 | 42.30 | 50.90 | 1739 | 52.70 | 51.90 |
| 1666 | 42.90 | 38.10 | 1703 | 42.40 | 53.10 | 1740 | 52.70 | 51.90 |
| 1667 | 42.70 | 33.70 | 1704 | 42.50 | 59.80 | 1741 | 52.70 | 51.90 |
| 1668 | 42.50 | 40.10 | 1705 | 42.70 | 58.20 | 1742 | 52.70 | 49.70 |
| 1669 | 42.50 | 46.70 | 1706 | 43.00 | 57.80 | 1743 | 52.60 | 45.30 |
| 1670 | 42.50 | 40.10 | 1707 | 43.00 | 51.30 | 1744 | 52.50 | 43.10 |
| 1671 | 42.30 | m | 1708 | 43.10 | 57.50 | 1745 | 52.40 | 45.20 |
| 1672 | 40.30 | m | 1709 | 43.20 | 64.50 | 1746 | 52.30 | m |
| 1673 | 38.40 | m | 1710 | 43.50 | 68.80 | 1747 | 50.70 | m |
| 1674 | 38.30 | m | 1711 | 43.90 | 70.30 | 1748 | 46.80 | m |
| 1675 | 38.20 | m | 1712 | 44.10 | 72.80 | 1749 | 42.60 | m |
| 1676 | 38.00 | m | 1713 | 44.20 | 72.20 | 1750 | 38.20 | m |
| 1677 | 37.50 | m | 1714 | 44.40 | 71.70 | 1751 | 33.60 | m |
| 1678 | 37.50 | m | 1715 | 44.80 | 72.40 | 1752 | 29.90 | m |
| 1679 | 37.50 | 44.00 | 1716 | 59.50 | 72.50 | 1753 | 37.60 | m |
| 1680 | 37.50 | 48.00 | 1717 | 74.60 | 73.00 | 1754 | 42.00 | m |
| 1681 | 37.50 | 50.00 | 1718 | 75.30 | 72.70 | 1755 | 37.40 | m |
| 1682 | 37.50 | 53.80 | 1719 | 76.80 | 73.20 | 1756 | 33.00 | m |
| 1683 | 38.50 | 56.70 | 1720 | 78.90 | 73.50 | 1757 | 48.60 | m |
| 1684 | 39.80 | 56.90 | 1721 | 65.00 | 73.50 | 1758 | 41.80 | m |
| 1685 | 40.70 | 57.50 | 1722 | 51.00 | 72.70 | 1759 | 35.50 | m |
| 1686 | 40.70 | 60.70 | 1723 | 51.50 | 72.30 | 1760 | 32.30 | m |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） | 时间（s） | 转速（%） | 负荷（%） |
| 1761 | 30.00 | m | 1775 | 0.00 | m | 1789 | 0.00 | 0.00 |
| 1762 | 45.80 | m | 1776 | 0.00 | m | 1790 | 0.00 | 0.00 |
| 1763 | 62.10 | m | 1777 | 0.00 | 0.00 | 1791 | 0.00 | 0.00 |
| 1764 | 59.00 | m | 1778 | 0.00 | 0.00 | 1792 | 0.00 | 0.00 |
| 1765 | 51.30 | m | 1779 | 0.00 | 0.00 | 1793 | 0.00 | 0.00 |
| 1766 | 42.50 | m | 1780 | 0.00 | 0.00 | 1794 | 0.00 | 0.00 |
| 1767 | 33.30 | m | 1781 | 0.00 | 0.00 | 1795 | 0.00 | 0.00 |
| 1768 | 40.40 | m | 1782 | 0.00 | 0.00 | 1796 | 0.00 | 0.00 |
| 1769 | 44.60 | m | 1783 | 0.00 | 0.00 | 1797 | 0.00 | 0.00 |
| 1770 | 28.70 | m | 1784 | 0.00 | 0.00 | 1798 | 0.00 | 0.00 |
| 1771 | 29.50 | m | 1785 | 0.00 | 0.00 | 1799 | 0.00 | 0.00 |
| 1772 | 18.10 | m | 1786 | 0.00 | 0.00 | 1800 | 0.00 | 0.00 |
| 1773 | 9.10 | m | 1787 | 0.00 | 0.00 |  |  |  |
| 1774 | 0.00 | m | 1788 | 0.00 | 0.00 |  |  |  |