

(e) stands but fails to keep pruning

1. 1.0.1.1 (1.0.1.1)

[illegible]

Boyle's law experiment. — Engine No. high speed etc.
60 ft of air at 100° F. Pressure 100 lb.
Engine of 100 ft.

① - significant - 10% difference

contact point & advance unit system - 700-1000
① condenser fault ② coil fault ③ spark plug gap ④ fuel system trouble ⑤ V/V spring tension.
(6) distributor contact point & advance unit system - 700-1000 → Distributor contact point alignment system - 700-1000 → contact point spring tension, arm spring tension system - 700-1000, engine oil level, distributor shaft bushing, contact alignment system - 700-1000, spring tension point of view, high tension current of 6000V, engine oil level, condenser winding, high speed oil current of 700-1000, fuel system trouble, V/V spring tension, distributor contact point & advance unit system - 700-1000

③ Work fault collection of specific narrow patterns.
Commonly seen in the form of a narrow band of
insulation on the surface of the metal and the
work of the machine is missed.

4) Spark Plug Engines. In spark plug engines, the spark plug is used to ignite the mixture. The spark plug is a device that converts the electrical energy from the ignition system into a spark that ignites the mixture. The spark plug is made of a ceramic material that can withstand the high temperatures of the combustion process. The spark plug is threaded into the combustion chamber of the engine. The spark plug has a central electrode and a ground electrode. The central electrode is connected to the ignition system, and the ground electrode is connected to the engine block. The spark plug is designed to provide a reliable and consistent spark over a long period of time.

[illegible]

⑥ V/V Spring tension - Spring tension increases for a given speed of engine. The constant of 6000 psi per inch spring deflection means that if the spring deflection is 7 inches, the tension will be 42,000 psi.

(4) mistakes on acceleration or Hand pull
 1. Timing - Engine will not start properly if the timing is not correct. The timing should be set correctly.
 2. Ignition system - The ignition system should be checked for proper operation. The spark plugs should be replaced if necessary.
 3. Carburetor - The carburetor should be checked for proper operation. The fuel mixture should be adjusted if necessary.
 4. Valve action - The valve action should be checked for proper operation. The valves should be adjusted if necessary.

[illegible]

Value action. If in 1st engine I do need
If, not 1st 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, 32nd, 33rd, 34th, 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42nd, 43rd, 44th, 45th, 46th, 47th, 48th, 49th, 50th, 51st, 52nd, 53rd, 54th, 55th, 56th, 57th, 58th, 59th, 60th, 61st, 62nd, 63rd, 64th, 65th, 66th, 67th, 68th, 69th, 70th, 71st, 72nd, 73rd, 74th, 75th, 76th, 77th, 78th, 79th, 80th, 81st, 82nd, 83rd, 84th, 85th, 86th, 87th, 88th, 89th, 90th, 91st, 92nd, 93rd, 94th, 95th, 96th, 97th, 98th, 99th, 100th, 101st, 102nd, 103rd, 104th, 105th, 106th, 107th, 108th, 109th, 110th, 111th, 112th, 113th, 114th, 115th, 116th, 117th, 118th, 119th, 120th, 121st, 122nd, 123rd, 124th, 125th, 126th, 127th, 128th, 129th, 130th, 131st, 132nd, 133rd, 134th, 135th, 136th, 137th, 138th, 139th, 140th, 141st, 142nd, 143rd, 144th, 145th, 146th, 147th, 148th, 149th, 150th, 151st, 152nd, 153rd, 154th, 155th, 156th, 157th, 158th, 159th, 160th, 161st, 162nd, 163rd, 164th, 165th, 166th, 167th, 168th, 169th, 170th, 171st, 172nd, 173rd, 174th, 175th, 176th, 177th, 178th, 179th, 180th, 181st, 182nd, 183rd, 184th, 185th, 186th, 187th, 188th, 189th, 190th, 191st, 192nd, 193rd, 194th, 195th, 196th, 197th, 198th, 199th, 200th, 201st, 202nd, 203rd, 204th, 205th, 206th, 207th, 208th, 209th, 210th, 211st, 212nd, 213th, 214th, 215th, 216th, 217th, 218th, 219th, 220th, 221st, 222nd, 223rd, 224th, 225th, 226th, 227th, 228th, 229th, 230th, 231st, 232nd, 233rd, 234th, 235th, 236th, 237th, 238th, 239th, 240th, 241st, 242nd, 243rd, 244th, 245th, 246th, 247th, 248th, 249th, 250th, 251st, 252nd, 253rd, 254th, 255th, 256th, 257th, 258th, 259th, 260th, 261st, 262nd, 263rd, 264th, 265th, 266th, 267th, 268th, 269th, 270th, 271st, 272nd, 273rd, 274th, 275th, 276th, 277th, 278th, 279th, 280th, 281st, 282nd, 283rd, 284th, 285th, 286th, 287th, 288th, 289th, 290th, 291st, 292nd, 293rd, 294th, 295th, 296th, 297th, 298th, 299th, 300th, 301st, 302nd, 303rd, 304th, 305th, 306th, 307th, 308th, 309th, 310th, 311st, 312nd, 313th, 314th, 315th, 316th, 317th, 318th, 319th, 320th, 321st, 322nd, 323rd, 324th, 325th, 326th, 327th, 328th, 329th, 330th, 331st, 332nd, 333rd, 334th, 335th, 336th, 337th, 338th, 339th, 340th, 341st, 342nd, 343rd, 344th, 345th, 346th, 347th, 348th, 349th, 350th, 351st, 352nd, 353rd, 354th, 355th, 356th, 357th, 358th, 359th, 360th, 361st, 362nd, 363rd, 364th, 365th, 366th, 367th, 368th, 369th, 370th, 371st, 372nd, 373rd, 374th, 375th, 376th, 377th, 378th, 379th, 380th, 381st, 382nd, 383rd, 384th, 385th, 386th, 387th, 388th, 389th, 390th, 391st, 392nd, 393rd, 394th, 395th, 396th, 397th, 398th, 399th, 400th, 401st, 402nd, 403rd, 404th, 405th, 406th, 407th, 408th, 409th, 410th, 411st, 412nd, 413th, 414th, 415th, 416th, 417th, 418th, 419th, 420th, 421st, 422nd, 423rd, 424th, 425th, 426th, 427th, 428th, 429th, 430th, 431st, 432nd, 433rd, 434th, 435th, 436th, 437th, 438th, 439th, 440th, 441st, 442nd, 443rd, 444th, 445th, 446th, 447th, 448th, 449th, 450th, 451st, 452nd, 453rd, 454th, 455th, 456th, 457th, 458th, 459th, 460th, 461st, 462nd, 463rd, 464th, 465th, 466th, 467th, 468th, 469th, 470th, 471st, 472nd, 473rd, 474th, 475th, 476th, 477th, 478th, 479th, 480th, 481st, 482nd, 483rd, 484th, 485th, 486th, 487th, 488th, 489th, 490th, 491st, 492nd, 493rd, 494th, 495th, 496th, 497th, 498th, 499th, 500th, 501st, 502nd, 503rd, 504th, 505th, 506th, 507th, 508th, 509th, 510th, 511st, 512nd, 513th, 514th, 515th, 516th, 517th, 518th, 519th, 520th, 521st, 522nd, 523rd, 524th, 525th, 526th, 527th, 528th, 529th, 530th, 531st, 532nd, 533rd, 534th, 535th, 536th, 537th, 538th, 539th, 540th, 541st, 542nd, 543rd, 544th, 545th, 546th, 547th, 548th, 549th, 550th, 551st, 552nd, 553rd, 554th, 555th, 556th, 557th, 558th, 559th, 560th, 561st, 562nd, 563rd, 564th, 565th, 566th, 567th, 568th, 569th, 570th, 571st, 572nd, 573rd, 574th, 575th, 576th, 577th, 578th, 579th, 580th, 581st, 582nd, 583rd, 584th, 585th, 586th, 587th, 588th, 589th, 590th, 591st, 592nd, 593rd, 594th, 595th, 596th, 597th, 598th, 599th, 600th, 601st, 602nd, 603rd, 604th, 605th, 606th, 607th, 608th, 609th, 610th, 611st, 612nd, 613th, 614th, 615th, 616th, 617th, 618th, 619th, 620th, 621st, 622nd, 623rd, 624th, 625th, 626th, 627th, 628th, 629th, 630th, 631st, 632nd, 633rd, 634th, 635th, 636th, 637th, 638th, 639th, 640th, 641st, 642nd, 643rd, 644th, 645th, 646th, 647th, 648th, 649th, 650th, 651st, 652nd, 653rd, 654th, 655th, 656th, 657th, 658th, 659th, 660th, 661st, 662nd, 663rd, 664th, 665th, 666th, 667th, 668th, 669th, 670th, 671st, 672nd, 673rd, 674th, 675th, 676th, 677th, 678th, 679th, 680th, 681st, 682nd, 683rd, 684th, 685th, 686th, 687th, 688th, 689th, 690th, 691st, 692nd, 693rd, 694th, 695th, 696th, 697th, 698

Compression testing of concrete

Threaded connection gasket combination

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(c) Pre-ignition ignition - Chamber & spark
 combustion & over heating of spark plug. 1. Reinforce
 gasket & valve seat & 2. Pre-ignition & 3. Compression stroke & 4. Spark plug & 5. Pre-ignition
 Pre-ignition
 (d) Slip & 2. 3. 4. 5. 6. 7. 8. 9. 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. 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2013. 2014. 2015. 2016. 2017. 2018. 2019. 2020. 2021. 2022. 2023. 2024. 2025. 2026. 2027. 2028. 2029. 2030. 2031. 2032. 2033. 2034. 2035. 2036. 2037. 2038. 2039. 2040. 2041. 2042. 2043. 2044. 2045. 2046. 2047. 2048. 2049. 2050. 2051. 2052. 2053. 2054. 2055. 2056. 2057. 2058. 2059. 2060. 2061. 2062. 2063. 2064. 2065. 2066. 2067. 2068. 2069. 2070. 2071. 2072. 2073. 2074. 2075. 2076. 2077. 2078. 2079. 2080. 2081. 2082. 2083. 2084. 2085. 2086. 2087. 2088. 2089. 2090. 2091. 2092. 2093. 2094. 2095. 2096. 2097. 2098. 2099. 2100. 2101. 2102. 2103. 2104. 2105. 2106. 2107. 2108. 2109. 2110. 2111. 2112. 2113. 2114. 2115. 2116. 2117. 2118. 2119. 2120. 2121. 2122. 2123. 2124. 2125. 2126. 2127. 2128. 2129. 2130. 2131. 2132. 2133. 2134. 2135. 2136. 2137. 2138. 2139. 2140. 2141. 2142. 2143. 2144. 2145. 2146. 2147. 2148. 2149. 2150. 2151. 2152. 2153. 2154. 2155. 2156. 2157. 2158. 2159. 2160. 2161. 2162. 2163. 2164. 2165. 2166. 2167. 2168. 2169. 2170. 2171. 2172. 2173. 2174. 2175. 2176. 2177. 2178. 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[illegible]

1. If an engine is not working properly, engine oil
 pressure will be low. Oil pressure of 100 psi is normal pressure.
 If it is low, it will be 80 psi. Near top timing light
 is, it will be 100 psi. Timing light is 100 psi.
 2. If engine is not working properly, it will be 100 psi.
 3. If engine is not working properly, it will be 100 psi.
 4. If engine is not working properly, it will be 100 psi.
 5. If engine is not working properly, it will be 100 psi.
 6. If engine is not working properly, it will be 100 psi.
 7. If engine is not working properly, it will be 100 psi.
 8. If engine is not working properly, it will be 100 psi.
 9. If engine is not working properly, it will be 100 psi.
 10. If engine is not working properly, it will be 100 psi.

1. First step, and second: second;
- first step, and second can have end plan

১০০০ টাকার মধ্যে ৫০০ টাকা
 ১০০০ টাকার মধ্যে ৫০০ টাকা
 ১০০০ টাকার মধ্যে ৫০০ টাকা
 ১০০০ টাকার মধ্যে ৫০০ টাকা

3 mm of wire in coil by binder at 1/4 inch of
the spring binder of plug wire of short red wire
on of 20 250 gram on of 20 250 gram 30 250 gram
plug of 20 250 gram by binder at 1/4 inch of plug wire of short red
20 250 gram 30 250 gram 40 250 gram

[illegible]

① Engine speed increases when the throttle is opened. (A) Increase in engine speed. (B) Decrease in engine speed. (C) Increase in engine speed. (D) Decrease in engine speed.

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2) In an engine room, the engine oil (lubricant) is used for the cylinder, piston, and crankshaft. The oil is used to reduce friction and wear between the moving parts of the engine. The oil is also used to cool the engine and to prevent rust. The oil is used in the combustion chamber (where the fuel is burned) and in the crankcase (where the crankshaft is located). The oil is used in the piston and crankshaft bearings. The oil is used in the cylinder and piston rings. The oil is used in the crankshaft and piston pins. The oil is used in the cylinder and piston rings. The oil is used in the crankshaft and piston pins. The oil is used in the cylinder and piston rings. The oil is used in the crankshaft and piston pins.

1. Piston and Engine cover and of. Piston ring
 2. Piston pin gasket cover of. Piston pin. Piston
 3. Piston oil pan cap screw. Piston pin. Piston
 4. Piston crankshaft bearing. Piston oil seat. Piston
 5. Piston or grooved piston ring. Piston cover
 6. Piston oil filter. Piston cover. Piston
 7. Piston oil filter. Piston cover. Piston
 8. Piston oil filter. Piston cover. Piston
 9. Piston oil filter. Piston cover. Piston
 10. Piston oil filter. Piston cover. Piston

[illegible]

1. Introduction of the subject: Engineering.
 2. Definition of Engineering.
 3. Importance of Engineering.
 4. Scope of Engineering.
 5. History of Engineering.
 6. Future of Engineering.
 7. Conclusion.

1. Engine
 The engine is a 4-stroke, single-cylinder, vertical, overhead valve (OHV) engine. It has a displacement of 1.6 liters (1600 cc). The engine is equipped with a carburetor and a water pump. The operating temperature of the engine is 100°C. The engine is mounted on a frame.

6) CH_3COOH and CH_3COONa are weak and strong
 case dilution and pH will increase. CH_3COOH is a weak acid
 and CH_3COONa is a strong base. pH will increase
 on dilution. CH_3COOH is a weak acid and CH_3COONa
 is a strong base. pH will increase on dilution.
 7) CH_3COOH and CH_3COONa are weak and strong
 case dilution and pH will increase. CH_3COOH is a weak acid
 and CH_3COONa is a strong base. pH will increase
 on dilution. CH_3COOH is a weak acid and CH_3COONa
 is a strong base. pH will increase on dilution.

(4) Enthalpy of the gas, $h_g = 67.65$.

① engine oil pump to oil and 4 ft. 6 in. from
oil pump engine oil 4 ft. 6 in. oil pressure
gauge (oil) oil pressure warning light
3 pressure gauge (oil) 4 in. 6 in.
master gauge oil 4 ft. 6 in. 4 ft. 6 in.
oil gauge 4 ft. 6 in. 4 ft. 6 in. master
oil normal 4 ft. 6 in. 4 ft. 6 in. gauge 4 ft. 6 in.
gauge 4 ft. 6 in. 4 ft. 6 in. 4 ft. 6 in. 4 ft. 6 in.

Oil pressure of 600000

ଗୁଣବତ୍ତା

- ① Engine at idle speed
 1. oil pressure 2. oil level 3. oil temperature 4. oil quality 5. oil quantity 6. oil pressure 7. oil level 8. oil temperature 9. oil quality 10. oil quantity 11. oil pressure 12. oil level 13. oil temperature 14. oil quality 15. oil quantity 16. oil pressure 17. oil level 18. oil temperature 19. oil quality 20. oil quantity 21. oil pressure 22. oil level 23. oil temperature 24. oil quality 25. oil quantity 26. oil pressure 27. oil level 28. oil temperature 29. oil quality 30. oil quantity 31. oil pressure 32. oil level 33. oil temperature 34. oil quality 35. oil quantity 36. oil pressure 37. oil level 38. oil temperature 39. oil quality 40. oil quantity 41. oil pressure 42. oil level 43. oil temperature 44. oil quality 45. oil quantity 46. oil pressure 47. oil level 48. oil temperature 49. oil quality 50. oil quantity 51. oil pressure 52. oil level 53. oil temperature 54. oil quality 55. oil quantity 56. oil pressure 57. oil level 58. oil temperature 59. oil quality 60. oil quantity 61. oil pressure 62. oil level 63. oil temperature 64. oil quality 65. oil quantity 66. oil pressure 67. oil level 68. oil temperature 69. oil quality 70. oil quantity 71. oil pressure 72. oil level 73. oil temperature 74. oil quality 75. oil quantity 76. oil pressure 77. oil level 78. oil temperature 79. oil quality 80. oil quantity 81. oil pressure 82. oil level 83. oil temperature 84. oil quality 85. oil quantity 86. oil pressure 87. oil level 88. oil temperature 89. oil quality 90. oil quantity 91. oil pressure 92. oil level 93. oil temperature 94. oil quality 95. oil quantity 96. oil pressure 97. oil level 98. oil temperature 99. oil quality 100. oil quantity

1) Simple
 2) Compound
 3) Light
 4) Heavy
 5) Simple
 6) Compound
 7) Simple
 8) Compound
 9) Simple
 10) Compound
 11) Simple
 12) Compound
 13) Simple
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 15) Simple
 16) Compound
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 91) Simple
 92) Compound
 93) Simple
 94) Compound
 95) Simple
 96) Compound
 97) Simple
 98) Compound
 99) Simple
 100) Compound

11 Engine fails to start to warm up. ---

[illegible]

CHAPTER (VI)

Ignition System Trouble Shooting

(*) No Sparks

Engine No.

Engine No. Starter Motor
Plug wire
Plug wire
Plug wire
Plug wire

① Core to distributor high tension wire gap

④ distributor to plug high tension wire on: per
w: car.

⑦ Now at 4.5 g. of 1:1000 of 661 if we use battery terminal for coil & battery for 50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000, 2100, 2200, 2300, 2400, 2500, 2600, 2700, 2800, 2900, 3000, 3100, 3200, 3300, 3400, 3500, 3600, 3700, 3800, 3900, 4000, 4100, 4200, 4300, 4400, 4500, 4600, 4700, 4800, 4900, 5000, 5100, 5200, 5300, 5400, 5500, 5600, 5700, 5800, 5900, 6000, 6100, 6200, 6300, 6400, 6500, 6600, 6700, 6800, 6900, 7000, 7100, 7200, 7300, 7400, 7500, 7600, 7700, 7800, 7900, 8000, 8100, 8200, 8300, 8400, 8500, 8600, 8700, 8800, 8900, 9000, 9100, 9200, 9300, 9400, 9500, 9600, 9700, 9800, 9900, 10000, 10100, 10200, 10300, 10400, 10500, 10600, 10700, 10800, 10900, 11000, 11100, 11200, 11300, 11400, 11500, 11600, 11700, 11800, 11900, 12000, 12100, 12200, 12300, 12400, 12500, 12600, 12700, 12800, 12900, 13000, 13100, 13200, 13300, 13400, 13500, 13600, 13700, 13800, 13900, 14000, 14100, 14200, 14300, 14400, 14500, 14600, 14700, 14800, 14900, 15000, 15100, 15200, 15300, 15400, 15500, 15600, 15700, 15800, 15900, 16000, 16100, 16200, 16300, 16400, 16500, 16600, 16700, 16800, 16900, 17000, 17100, 17200, 17300, 17400, 17500, 17600, 17700, 17800, 17900, 18000, 18100, 18200, 18300, 18400, 18500, 18600, 18700, 18800, 18900, 19000, 19100, 19200, 19300, 19400, 19500, 19600, 19700, 19800, 19900, 20000, 20100, 20200, 20300, 20400, 20500, 20600, 20700, 20800, 20900, 21000, 21100, 21200, 21300, 21400, 21500, 21600, 21700, 21800, 21900, 22000, 22100, 22200, 22300, 22400, 22500, 22600, 22700, 22800, 22900, 23000, 23100, 23200, 23300, 23400, 23500, 23600, 23700, 23800, 23900, 24000, 24100, 24200, 24300, 24400, 24500, 24600, 24700, 24800, 24900, 25000, 25100, 25200, 25300, 25400, 25500, 25600, 25700, 25800, 25900, 26000, 26100, 26200, 26300, 26400, 26500, 26600, 26700, 26800, 26900, 27000, 27100, 27200, 27300, 27400, 27500, 27600, 27700, 27800, 27900, 28000, 28100, 28200, 28300, 28400, 28500, 28600, 28700, 28800, 28900, 29000, 29100, 29200, 29300, 29400, 29500, 29600, 29700, 29800, 29900, 30000, 30100, 30200, 30300, 30400, 30500, 30600, 30700, 30800, 30900, 31000, 31100, 31200, 31300, 31400, 31500, 31600, 31700, 31800, 31900, 32000, 32100, 32200, 32300, 32400, 32500, 32600, 32700, 32800, 32900, 33000, 33100, 33200, 33300, 33400, 33500, 33600, 33700, 33800, 33900, 34000, 34100, 34200, 34300, 34400, 34500, 34600, 34700, 34800, 34900, 35000, 35100, 35200, 35300, 35400, 35500, 35600, 35700, 35800, 35900, 36000, 36100, 36200, 36300, 36400, 36500, 36600, 36700, 36800, 36900, 37000, 37100, 37200, 37300, 37400, 37500, 37600, 37700, 37800, 37900, 38000, 38100, 38200, 38300, 38400, 38500, 38600, 38700, 38800, 38900, 39000, 39100, 39200, 39300, 39400, 39500, 39600, 39700, 39800, 39900, 40000, 40100, 40200, 40300, 40400, 40500, 40600, 40700, 40800, 40900, 41000, 41100, 41200, 41300, 41400, 41500, 41600, 41700, 41800, 41900, 42000, 42100, 42200, 42300, 42400, 42500, 42600, 42700, 42800, 42900, 43000, 43100, 43200, 43300, 43400, 43500, 43600, 43700, 43800, 43900, 44000, 44100, 44200, 44300, 44400, 44500, 44600, 44700, 44800, 44900, 45000, 45100, 45200, 45300, 45400, 45500, 45600, 45700, 45800, 45900, 46000, 46100, 46200, 46300, 46400, 46500, 46600, 46700, 46800, 46900, 47000, 47100, 47200, 47300, 47400, 47500, 47600, 47700, 47800, 47900, 48000, 48100, 48200, 48300, 48400, 48500, 48600, 48700, 48800, 48900, 49000, 49100, 49200, 49300, 49400, 49500, 49600, 49700, 49800, 49900, 50000, 50100, 50200, 50300, 50400, 50500, 50600, 50700, 50800, 50900, 51000, 51100, 51200, 51300, 51400, 51500, 51600, 51700, 51800, 51900, 52000, 52100, 52200, 52300, 52400, 52500, 52600, 52700, 52800, 52900, 53000, 53100, 53200, 53300, 53400, 53500, 53600, 53700, 53800, 53900, 54000, 54100, 54200, 54300, 54400, 54500, 54600, 54700, 54800, 54900, 55000, 55100, 55200, 55300, 55400, 55500, 55600, 55700, 55800, 55900, 56000, 56100, 56200, 56300, 56400, 56500, 56600, 56700, 56800, 56900, 57000, 57100, 57200, 57300, 57400, 57500, 57600, 57700, 57800, 57900, 58000, 58100, 58200, 58300, 58400, 58500, 58600, 58700, 58800, 5

Zero flux core coils distributor & can
primary winding & can & can & can & can
Zero flux core & can & can & can & can
Zero flux core & can & can & can & can

(in Engine) $\omega = \omega$; n - ammeter 97 to 9 amp
60 rpm \rightarrow

[illegible]

Maths:

Maths

Drawn

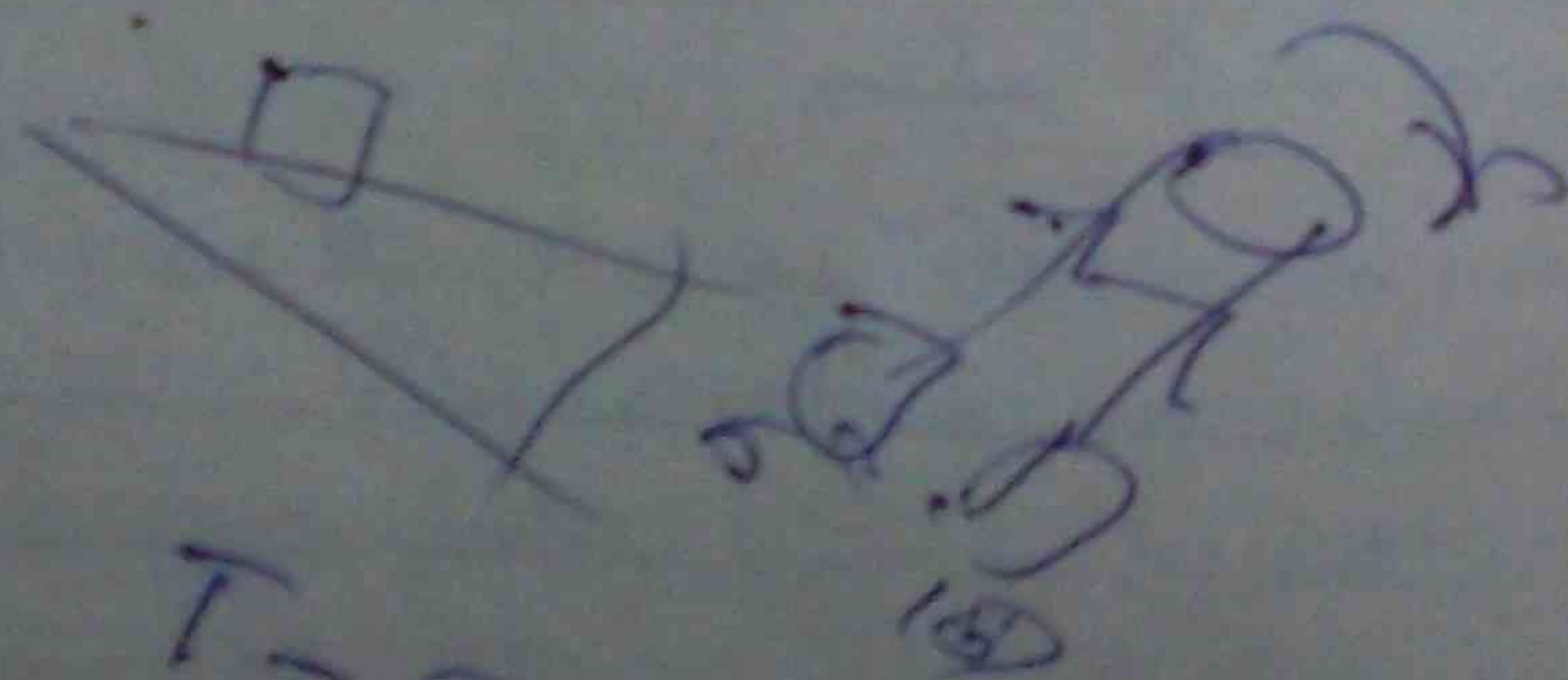
Applied

political

Work / to

бетонсе

Science



$T - 69 = 6.2$ — ①
 $\log - T = 10.4$

Check Test And Adjustment

Fuel pump: ၇၀၆: ၁၂၀၆၆၀: ၃၆၆၃၃၃၃၃: ၅၅၅၅၅၅၅၅

الحمد لله

① Priming Test - 50.000 & 25.000 engine @ 1 engine

Ques 7) $\omega = 1000 \text{ rad/s}$ engine crank is shown

in pump & engine order: 6° - 0° & 102°, crank 180° & 300°

পারস্যের মৌর্য সাম্রাজ্যের সময় ৫৬০ খ্রিস্টাব্দে

of: for 2nd engine of Cramér & Vigneron St. Pumpal

Engine, flue and pipe work, etc. in the boiler

Pump lever at 200 mm 2000. ~ 1000 mm 1000 mm

10/18/2019 and we are now in the 10/18/2019

Engineering: 09/09/2023

...the ...

24. 2019, 10:00 AM. 2019, 10:00 AM. 2019, 10:00 AM.

to 6 months by mid 2036, year 5. Plan scenario

[illegible]

30. 6 mm 6 30 up 2 A 2 or 4 m of maximum of m

cd) missing cylinder test

Englische Grammatik

— 18-10-1954 10:00 AM

① ω of cylinder $\omega = \frac{v}{r}$

[illegible]

2. Internal engine of motor vehicle
of 200 cc.

(c) Four or six cylinder engine.

Engine at Fast Idle speed 50, if not 60.
Spark plug in at 100: a short test of 2nd
cylinder at 100: or 1st Spark plug at 100
or 1st Engine at 100: 60 or 70 with 100
or 1st at 100: 60, 1st at 100: 2nd at 100
or 1st at 100: 60, 1st at 100: 2nd at 100

(2) VR Engine Engine. Fast Idle speed & low rev. Flare order full range cylinder. Short work VR engine of 1000 cc. 1000 cc.

cylinder: 1. 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, 32nd, 33rd, 34th, 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42nd, 43rd, 44th, 45th, 46th, 47th, 48th, 49th, 50th, 51st, 52nd, 53rd, 54th, 55th, 56th, 57th, 58th, 59th, 60th, 61st, 62nd, 63rd, 64th, 65th, 66th, 67th, 68th, 69th, 70th, 71st, 72nd, 73rd, 74th, 75th, 76th, 77th, 78th, 79th, 80th, 81st, 82nd, 83rd, 84th, 85th, 86th, 87th, 88th, 89th, 90th, 91st, 92nd, 93rd, 94th, 95th, 96th, 97th, 98th, 99th, 100th, 101st, 102nd, 103rd, 104th, 105th, 106th, 107th, 108th, 109th, 110th, 111th, 112th, 113th, 114th, 115th, 116th, 117th, 118th, 119th, 120th, 121st, 122nd, 123rd, 124th, 125th, 126th, 127th, 128th, 129th, 130th, 131st, 132nd, 133rd, 134th, 135th, 136th, 137th, 138th, 139th, 140th, 141st, 142nd, 143rd, 144th, 145th, 146th, 147th, 148th, 149th, 150th, 151st, 152nd, 153rd, 154th, 155th, 156th, 157th, 158th, 159th, 160th, 161st, 162nd, 163rd, 164th, 165th, 166th, 167th, 168th, 169th, 170th, 171st, 172nd, 173rd, 174th, 175th, 176th, 177th, 178th, 179th, 180th, 181st, 182nd, 183rd, 184th, 185th, 186th, 187th, 188th, 189th, 190th, 191st, 192nd, 193rd, 194th, 195th, 196th, 197th, 198th, 199th, 200th, 201st, 202nd, 203rd, 204th, 205th, 206th, 207th, 208th, 209th, 210th, 211st, 212nd, 213th, 214th, 215th, 216th, 217th, 218th, 219th, 220th, 221st, 222nd, 223rd, 224th, 225th, 226th, 227th, 228th, 229th, 230th, 231st, 232nd, 233rd, 234th, 235th, 236th, 237th, 238th, 239th, 240th, 241st, 242nd, 243rd, 244th, 245th, 246th, 247th, 248th, 249th, 250th, 251st, 252nd, 253rd, 254th, 255th, 256th, 257th, 258th, 259th, 260th, 261st, 262nd, 263rd, 264th, 265th, 266th, 267th, 268th, 269th, 270th, 271st, 272nd, 273rd, 274th, 275th, 276th, 277th, 278th, 279th, 280th, 281st, 282nd, 283rd, 284th, 285th, 286th, 287th, 288th, 289th, 290th, 291st, 292nd, 293rd, 294th, 295th, 296th, 297th, 298th, 299th, 300th, 301st, 302nd, 303rd, 304th, 305th, 306th, 307th, 308th, 309th, 310th, 311st, 312nd, 313th, 314th, 315th, 316th, 317th, 318th, 319th, 320th, 321st, 322nd, 323rd, 324th, 325th, 326th, 327th, 328th, 329th, 330th, 331st, 332nd, 333rd, 334th, 335th, 336th, 337th, 338th, 339th, 340th, 341st, 342nd, 343rd, 344th, 345th, 346th, 347th, 348th, 349th, 350th, 351st, 352nd, 353rd, 354th, 355th, 356th, 357th, 358th, 359th, 360th, 361st, 362nd, 363rd, 364th, 365th, 366th, 367th, 368th, 369th, 370th, 371st, 372nd, 373rd, 374th, 375th, 376th, 377th, 378th, 379th, 380th, 381st, 382nd, 383rd, 384th, 385th, 386th, 387th, 388th, 389th, 390th, 391st, 392nd, 393rd, 394th, 395th, 396th, 397th, 398th, 399th, 400th, 401st, 402nd, 403rd, 404th, 405th, 406th, 407th, 408th, 409th, 410th, 411st, 412nd, 413th, 414th, 415th, 416th, 417th, 418th, 419th, 420th, 421st, 422nd, 423rd, 424th, 425th, 426th, 427th, 428th, 429th, 430th, 431st, 432nd, 433rd, 434th, 435th, 436th, 437th, 438th, 439th, 440th, 441st, 442nd, 443rd, 444th, 445th, 446th, 447th, 448th, 449th, 450th, 451st, 452nd, 453rd, 454th, 455th, 456th, 457th, 458th, 459th, 460th, 461st, 462nd, 463rd, 464th, 465th, 466th, 467th, 468th, 469th, 470th, 471st, 472nd, 473rd, 474th, 475th, 476th, 477th, 478th, 479th, 480th, 481st, 482nd, 483rd, 484th, 485th, 486th, 487th, 488th, 489th, 490th, 491st, 492nd, 493rd, 494th, 495th, 496th, 497th, 498th, 499th, 500th, 501st, 502nd, 503rd, 504th, 505th, 506th, 507th, 508th, 509th, 510th, 511st, 512nd, 513th, 514th, 515th, 516th, 517th, 518th, 519th, 520th, 521st, 522nd, 523rd, 524th, 525th, 526th, 527th, 528th, 529th, 530th, 531st, 532nd, 533rd, 534th, 535th, 536th, 537th, 538th, 539th, 540th, 541st, 542nd, 543rd, 544th, 545th, 546th, 547th, 548th, 549th, 550th, 551st, 552nd, 553rd, 554th, 555th, 556th, 557th, 558th, 559th, 560th, 561st, 562nd, 563rd, 564th, 565th, 566th, 567th, 568th, 569th, 570th, 571st, 572nd, 573rd, 574th, 575th, 576th, 577th, 578th, 579th, 580th, 581st, 582nd, 583rd, 584th, 585th, 586th, 587th, 588th, 589th, 590th, 591st, 592nd, 593rd, 594th, 595th, 596th, 597th, 598th, 599th, 600th, 601st, 602nd, 603rd, 604th, 605th, 606th, 607th, 608th, 609th, 610th, 611st, 612nd, 613th, 614th, 615th, 616th, 617th, 618th, 619th, 620th, 621st, 622nd, 623rd, 624th, 625th, 626th, 627th, 628th, 629th, 630th, 631st, 632nd, 633rd, 634th, 635th, 636th, 637th, 638th, 639th, 640th, 641st, 642nd, 643rd, 644th, 645th, 646th, 647th, 648th, 649th, 650th, 651st, 652nd, 653rd, 654th, 655th, 656th, 657th, 658th, 659th, 660th, 661st, 662nd, 663rd, 664th, 665th, 666th, 667th, 668th, 669th, 670th, 671st, 672nd, 673rd, 674th, 675th, 676th, 677th, 678th, 679th, 680th, 681st, 682nd, 683rd, 684th, 685th, 686th, 687th, 688th, 689th, 690th, 691st, 692nd, 693rd, 694th, 695th, 696th, 697th, 698th, 699th,

(c) Dual Ignition $\phi = 22^\circ$ (coil) $\phi = 5^\circ$ (spark)

4562 Ignition system of engine
 of 4 cylinder: In primary winding of coil
 connected in series with the contact breaker
 of the distributor. The secondary winding of coil
 is connected to the spark plug of each cylinder.
 The primary winding of coil is connected to the
 battery through the contact breaker. The secondary
 winding of coil is connected to the spark plug of each
 cylinder. The contact breaker is connected to the
 battery through the primary winding of coil. The
 secondary winding of coil is connected to the spark
 plug of each cylinder. The contact breaker is
 connected to the battery through the primary
 winding of coil. The secondary winding of coil
 is connected to the spark plug of each cylinder.

[illegible]

1. Spark plug is a device which converts the electrical energy into heat energy to ignite the fuel mixture in the cylinder. It is a part of the ignition system. The spark plug is made of a central electrode and a side electrode. The gap between the electrodes is the spark gap. The spark plug is used to ignite the fuel mixture in the cylinder. The spark plug is a part of the ignition system. The spark plug is made of a central electrode and a side electrode. The gap between the electrodes is the spark gap. The spark plug is used to ignite the fuel mixture in the cylinder.

Spark Plug

(i) Testing

1. The spark plug is tested by using a spark plug tester. The spark plug is inserted into the tester and the engine is run. The spark plug is tested by using a spark plug tester. The spark plug is inserted into the tester and the engine is run. The spark plug is tested by using a spark plug tester. The spark plug is inserted into the tester and the engine is run.

2. The spark plug is tested by using a spark plug tester. The spark plug is inserted into the tester and the engine is run. The spark plug is tested by using a spark plug tester. The spark plug is inserted into the tester and the engine is run.

(ii) Clean sand blast cleaner can spark plug. The spark plug is cleaned by using a sand blast cleaner. The spark plug is cleaned by using a sand blast cleaner. The spark plug is cleaned by using a sand blast cleaner.

(iii) Spacing Spark plug gap. The spark plug gap is the distance between the two electrodes. The spark plug gap is the distance between the two electrodes. The spark plug gap is the distance between the two electrodes.

gap of 0.0005 to 0.001 inch. The spark plug gap is the distance between the two electrodes. The spark plug gap is the distance between the two electrodes. The spark plug gap is the distance between the two electrodes.

(iv) Inspecting - Spark plug center electrode. The spark plug center electrode is the central electrode. The spark plug center electrode is the central electrode. The spark plug center electrode is the central electrode.

Ch. 1. Thermophilic Creek

Cor. for salt adjustment

[illegible]

② Pressure Flushing - method of maintaining
conf of oil in cooling system 2 cycle: oil - filter - oil - in

(a) straight flushing - 5% of engine oil is lost

1. Engine flushing: To remove the dirt and sludge from the engine. It is done by running the engine with a flushing oil. The flushing oil is a special oil which is designed to remove the dirt and sludge from the engine. It is used in the following way:

1. Reverse flushing: This is done by running the engine with the flushing oil in reverse. This means that the oil is pumped from the oil pan to the cylinder. This is done by running the engine with the oil pump disconnected and the oil pan cap removed. The oil is then pumped from the oil pan to the cylinder by the action of the piston and ring. This is done for about 10 minutes.
2. Normal flushing: This is done by running the engine with the flushing oil in normal. This means that the oil is pumped from the oil pan to the cylinder. This is done by running the engine with the oil pump connected and the oil pan cap removed. The oil is then pumped from the oil pan to the cylinder by the action of the piston and ring. This is done for about 10 minutes.



VIII Engine performance and Testing

(a) compression test - To check the condition of the engine. It is done by measuring the compression pressure in the cylinder. The compression pressure is measured by a compression gauge. The gauge is connected to the cylinder and the engine is cranked. The pressure is then read on the gauge.

$$\text{compression} - \text{normal compression} = \frac{(\text{atmospheric pressure} \times \text{compression ratio})}{(\text{atmospheric pressure} + 5)}$$

(b) compression test - To check the condition of the engine. It is done by measuring the compression pressure in the cylinder. The compression pressure is measured by a compression gauge. The gauge is connected to the cylinder and the engine is cranked. The pressure is then read on the gauge.

1. Spark plug - To check the condition of the spark plug. It is done by removing the spark plug and inspecting it. The spark plug should be clean and free of carbon. If it is dirty, it should be cleaned. If it is worn, it should be replaced.
2. Air cleaner - To check the condition of the air cleaner. It is done by removing the air cleaner and inspecting it. The air cleaner should be clean and free of dirt. If it is dirty, it should be cleaned. If it is worn, it should be replaced.
3. Valve adjustment - To check the condition of the valves. It is done by adjusting the valves. The valves should be adjusted to the correct clearance. If they are not, they should be adjusted.
4. Ignition switch - To check the condition of the ignition switch. It is done by turning the ignition switch on and off. The switch should work properly. If it does not, it should be replaced.
5. Ignition coil - To check the condition of the ignition coil. It is done by testing the coil. The coil should be tested for resistance. If it is not within the correct range, it should be replaced.
6. Cylinder pressure - To check the condition of the cylinder. It is done by measuring the cylinder pressure. The cylinder pressure should be measured at the top of the cylinder. If it is not within the correct range, it should be checked.
7. Valve clearance - To check the condition of the valves. It is done by adjusting the valves. The valves should be adjusted to the correct clearance. If they are not, they should be adjusted.
8. Engine oil - To check the condition of the engine oil. It is done by checking the oil level. The oil level should be checked regularly. If it is low, it should be topped up. If it is dirty, it should be changed.
9. Cylinder and valve - To check the condition of the cylinder and valve. It is done by inspecting the cylinder and valve. The cylinder and valve should be inspected regularly. If they are worn, they should be replaced.
10. Engine oil - To check the condition of the engine oil. It is done by checking the oil level. The oil level should be checked regularly. If it is low, it should be topped up. If it is dirty, it should be changed.

1) Normal compression test: 60-80 psi (60-80 lb/sq in)
 2) Combustion chamber test: 60-80 psi (60-80 lb/sq in)
 3) Engine head test: 60-80 psi (60-80 lb/sq in)
 4) Carbon test: 60-80 psi (60-80 lb/sq in)
 5) Cylinder test: 60-80 psi (60-80 lb/sq in)
 6) Piston test: 60-80 psi (60-80 lb/sq in)
 7) Valve test: 60-80 psi (60-80 lb/sq in)
 8) Spark test: 60-80 psi (60-80 lb/sq in)
 9) Oil test: 60-80 psi (60-80 lb/sq in)
 10) Light test: 60-80 psi (60-80 lb/sq in)
 11) Spark test: 60-80 psi (60-80 lb/sq in)
 12) Oil test: 60-80 psi (60-80 lb/sq in)
 13) Light test: 60-80 psi (60-80 lb/sq in)
 14) Spark test: 60-80 psi (60-80 lb/sq in)
 15) Oil test: 60-80 psi (60-80 lb/sq in)
 16) Light test: 60-80 psi (60-80 lb/sq in)
 17) Spark test: 60-80 psi (60-80 lb/sq in)
 18) Oil test: 60-80 psi (60-80 lb/sq in)
 19) Light test: 60-80 psi (60-80 lb/sq in)
 20) Spark test: 60-80 psi (60-80 lb/sq in)

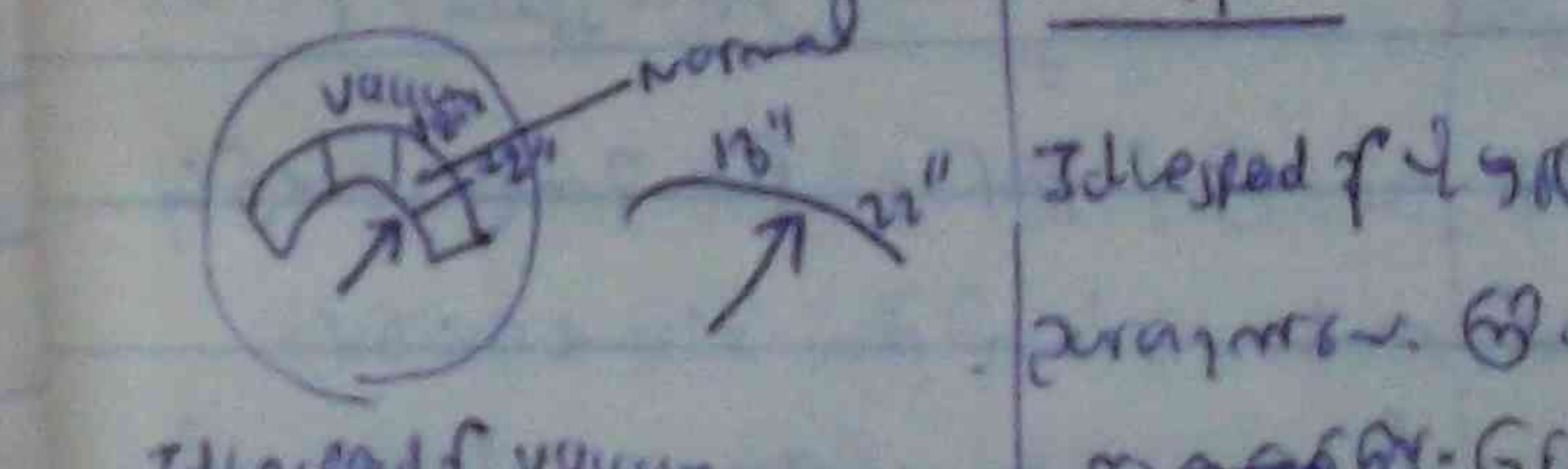
1) Normal engine
 2) Sticking valve or no spark
 3) Worn or broken valve spring
 4) Normal valve guide
 5) Late valve timing
 6) Early valve timing
 7) Valve burning
 8) Valve leakage
 9) Valve sticking
 10) Valve not seating
 11) Valve not opening
 12) Valve not closing
 13) Valve not timing
 14) Valve not working
 15) Valve not moving
 16) Valve not rotating
 17) Valve not vibrating
 18) Valve not pulsing
 19) Valve not oscillating
 20) Valve not resonating

1) Normal engine
 2) Sticking valve or no spark
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Engine test: 1) Normal engine
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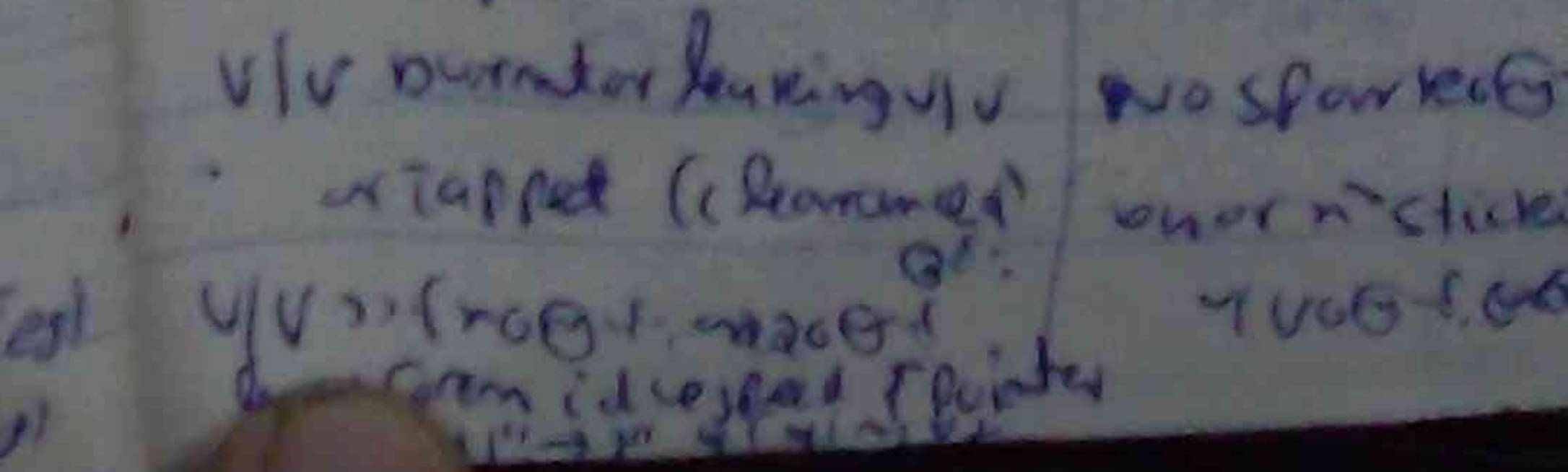


Normal engine



Idle speed of vacuum
 gauge vacuum 16-22"
 16-22" (16-22 lb/sq in)
 16-22" (16-22 lb/sq in)
 16-22" (16-22 lb/sq in)
 16-22" (16-22 lb/sq in)
 16-22" (16-22 lb/sq in)
 16-22" (16-22 lb/sq in)
 16-22" (16-22 lb/sq in)
 16-22" (16-22 lb/sq in)
 16-22" (16-22 lb/sq in)
 16-22" (16-22 lb/sq in)

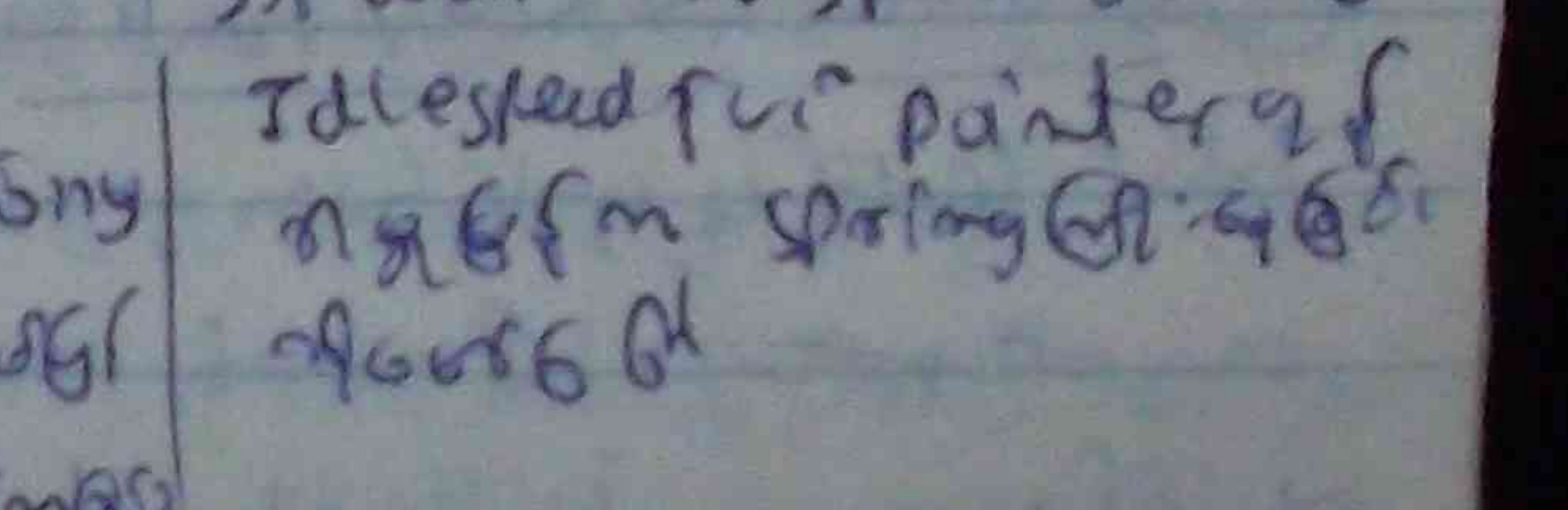
Worn or broken valve spring



Normal valve guide

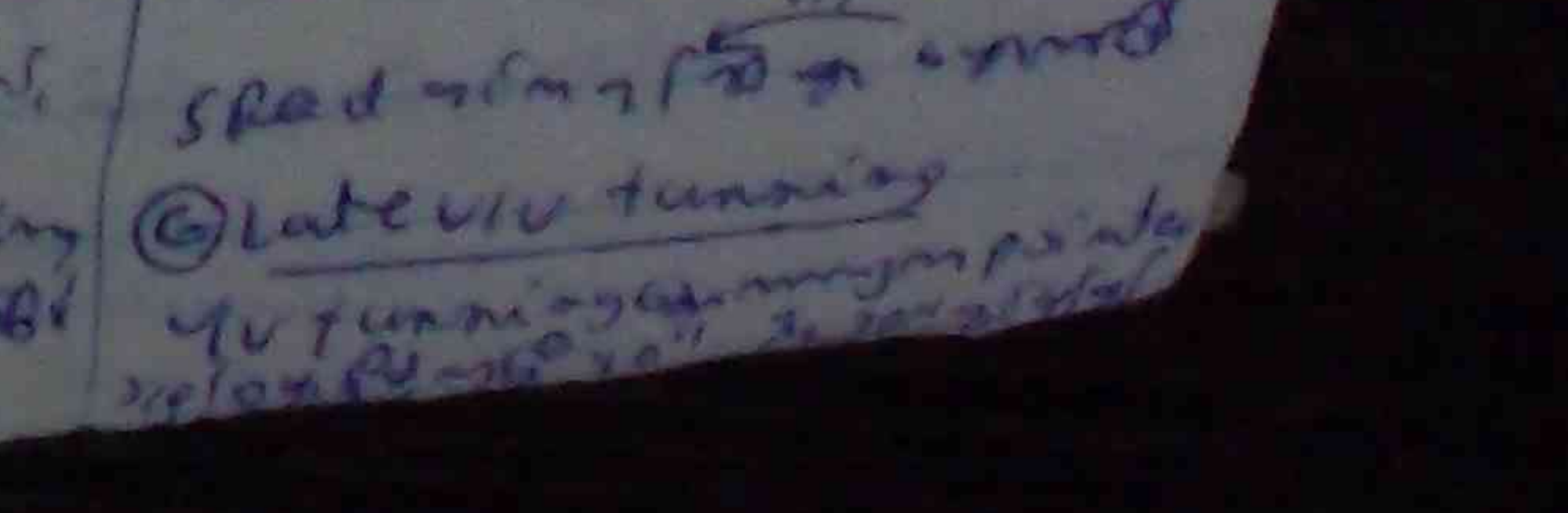
1) Normal engine
 2) Sticking valve or no spark
 3) Worn or broken valve spring
 4) Normal valve guide
 5) Late valve timing
 6) Early valve timing
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 8) Valve leakage
 9) Valve sticking
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 19) Valve not oscillating
 20) Valve not resonating

Worn or broken valve spring



Idle speed of vacuum
 gauge vacuum 16-22"
 16-22" (16-22 lb/sq in)
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 16-22" (16-22 lb/sq in)
 16-22" (16-22 lb/sq in)
 16-22" (16-22 lb/sq in)
 16-22" (16-22 lb/sq in)
 16-22" (16-22 lb/sq in)

Normal valve guide



Late valve timing



① Intake Ignition Timing
 pointing to 6000 RPM

② Intake Valve Timing
 pointing to 6000 RPM

③ Intake Valve Lift
 pointing to 6000 RPM

④ Intake Valve Area
 pointing to 6000 RPM



⑤ Exhaust Valve Timing
 pointing to 6000 RPM

⑥ Exhaust Valve Lift
 pointing to 6000 RPM

⑦ Exhaust Valve Area
 pointing to 6000 RPM

⑧ Exhaust Valve Timing
 pointing to 6000 RPM

⑨ Exhaust Valve Lift
 pointing to 6000 RPM

⑩ Exhaust Valve Area
 pointing to 6000 RPM

⑪ Exhaust Valve Timing
 pointing to 6000 RPM

⑫ Exhaust Valve Timing
 pointing to 6000 RPM



⑬ Exhaust Valve Lift
 pointing to 6000 RPM

⑭ Exhaust Valve Area
 pointing to 6000 RPM

⑮ Exhaust Valve Timing
 pointing to 6000 RPM

⑯ Exhaust Valve Lift
 pointing to 6000 RPM

⑰ Exhaust Valve Area
 pointing to 6000 RPM

⑱ Exhaust Valve Timing
 pointing to 6000 RPM

⑲ Exhaust Valve Lift
 pointing to 6000 RPM

⑳ Exhaust Valve Area
 pointing to 6000 RPM

㉑ Exhaust Valve Timing
 pointing to 6000 RPM

㉒ Exhaust Valve Lift
 pointing to 6000 RPM

㉓ Exhaust Valve Area
 pointing to 6000 RPM

② Exhaust Valve Timing
 pointing to 6000 RPM

③ Exhaust Valve Lift
 pointing to 6000 RPM

④ Exhaust Valve Area
 pointing to 6000 RPM

⑤ Exhaust Valve Timing
 pointing to 6000 RPM

⑥ Exhaust Valve Lift
 pointing to 6000 RPM

⑦ Exhaust Valve Area
 pointing to 6000 RPM

⑧ Exhaust Valve Timing
 pointing to 6000 RPM

⑨ Exhaust Valve Lift
 pointing to 6000 RPM

⑩ Exhaust Valve Area
 pointing to 6000 RPM

⑪ Exhaust Valve Timing
 pointing to 6000 RPM

⑫ Exhaust Valve Lift
 pointing to 6000 RPM

⑬ Exhaust Valve Area
 pointing to 6000 RPM

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⑮ Exhaust Valve Lift
 pointing to 6000 RPM

⑯ Exhaust Valve Area
 pointing to 6000 RPM

㉑ Exhaust Valve Timing
 pointing to 6000 RPM

㉒ Exhaust Valve Lift
 pointing to 6000 RPM

㉓ Exhaust Valve Area
 pointing to 6000 RPM

㉔ Exhaust Valve Timing
 pointing to 6000 RPM

㉕ Exhaust Valve Lift
 pointing to 6000 RPM

㉖ Exhaust Valve Area
 pointing to 6000 RPM

㉗ Exhaust Valve Timing
 pointing to 6000 RPM

㉘ Exhaust Valve Lift
 pointing to 6000 RPM

㉙ Exhaust Valve Area
 pointing to 6000 RPM

㉚ Exhaust Valve Timing
 pointing to 6000 RPM

㉛ Exhaust Valve Lift
 pointing to 6000 RPM

Time Table

| | | |
|----------|-----------------|---------|
| Saturday | 3 p.m. - 5 p.m. | Maths |
| Sunday | " | English |

$$ax^2 + bx + c = 0 \quad y^2$$

$$\frac{1}{2} = \frac{1}{R} - \frac{1}{S}$$

Theory of machines

$$\frac{1}{2} = \frac{R}{S} - \frac{1}{S}$$

Petrol Engine

Diesel Engines

$$= \frac{1 - R}{S} \times \frac{1}{S}$$

Auto-Technology

Auto Electricity

(L)

Refrigeration & Air conditioning + Theory & Practice

Refrigeration

Fuels

gas & combustion

Pumps

compressors

Welding

Fitting the machine parts

Pipe fitting

(1)

(2)

(3)

(4)

6/11/15
(1 m)

cadet ngas waring

GO

67
+41

KN 90

Theory of Engines - -
- and Mechanical -
- Engineering Knowledge

120

Volume

① Diesel
② Engines

Engine Series



Electrical power courses - 2 years

Mechanical power courses - 1 year

Tools
repair the machines - 9 months

work shop practical - 2-3 years + 3 month

+ advanced elect.

practical

Basic mechanical Engineering

G.T.I (M.P / M.T courses)

Engine Knowledge

- ✓ * Diesel Engines
- * Petrol Engines
- ✓ * Automotive Technology
- ✓ * Auto Electricity
- ✓ * Theory of machines
- ✓ * I.C Engines
- ✓ * Heat Engines

Tools Knowledge

- * Production Technology
- ✓ * Workshop Technology
- * Metallurgy
- * Machine Tools and Design

Electrical
machines
KNOWLEDGES

- A.C machines
- D.C machines
- Powering
- E. Measurement
- Motor Repair
- Electro Technology

- ✓ 1 Diesel Engine
- ✓ 2 Automotive Technology
- ✓ 3 Auto Electricity
- ✓ 4 Theory of Machines
- 5 Production Technology

① DIESEL ENGINES

cycle of operation

2 cycle engine or 2 stroke power stroke of 1 revolution of crank shaft
 and 1 revolution of 4 cycle engine or 2 stroke power stroke of 2 revolutions of crank shaft
 720 revolution of crank shaft, cylinder of 1 revolution of 2 stroke engine
 720 revolution of crank shaft, cylinder of 2 revolutions of 4 stroke engine
 720 revolution of crank shaft, cylinder of 4 revolutions of 8 stroke engine

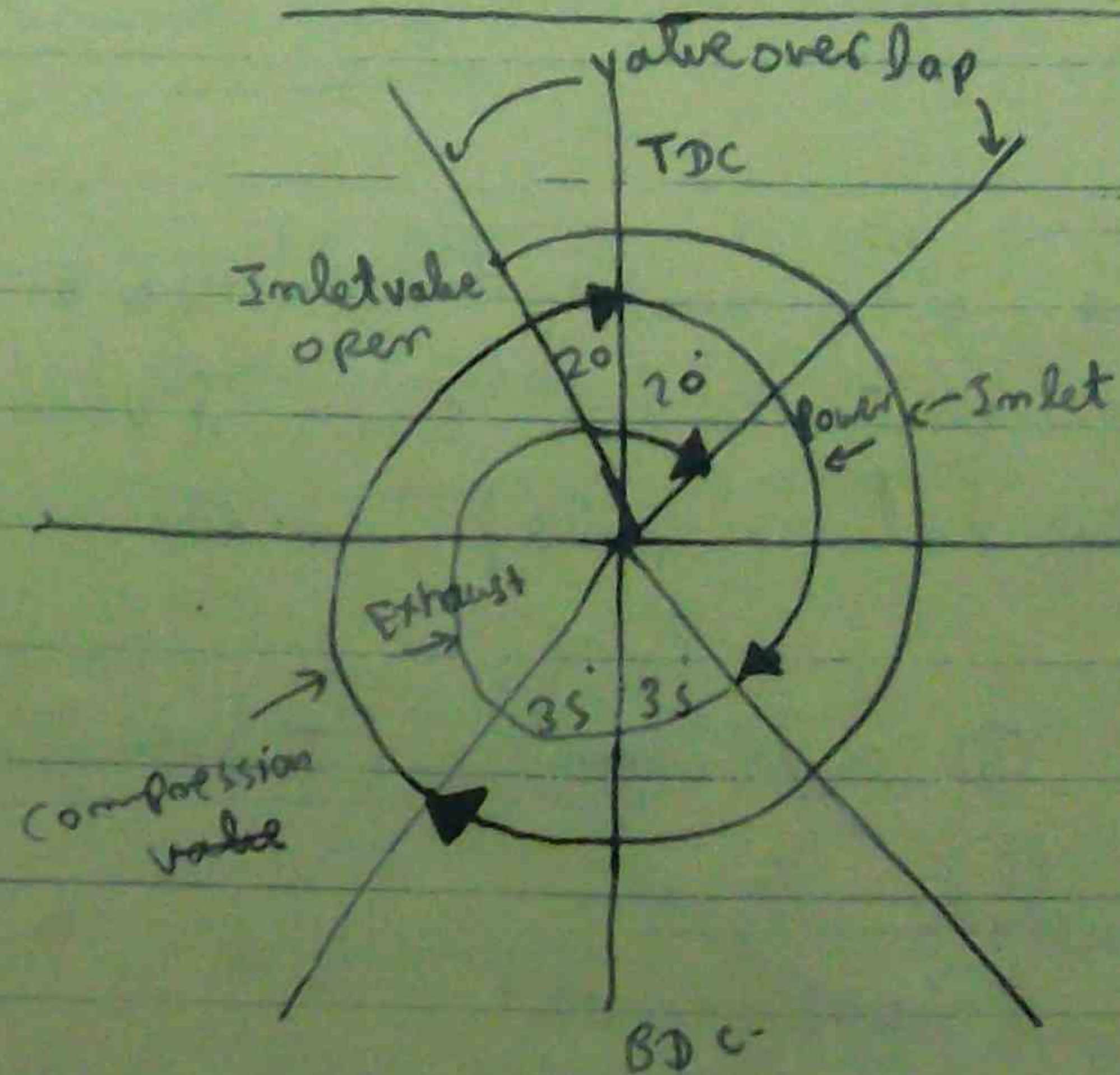
$$\frac{720}{4} = 180$$

cylinder 8 revolution power stroke of 1 revolution of 8 stroke engine

$$\frac{720}{8} = 90$$

of 8 stroke engine cylinder 1 revolution power stroke of 1 revolution of 8 stroke engine
 shaft - 1 revolution of 8 stroke engine

4 cycle valve Timing Diagram



- crank pin joint is of the type of ball joint.

Inlet

The velocity of air is high velocity air up to 1000 m/s. Compression

The velocity of air is high velocity air up to 1000 m/s. Injection of fuel

Power

The velocity of air is high velocity air up to 1000 m/s. Power

Exhaust

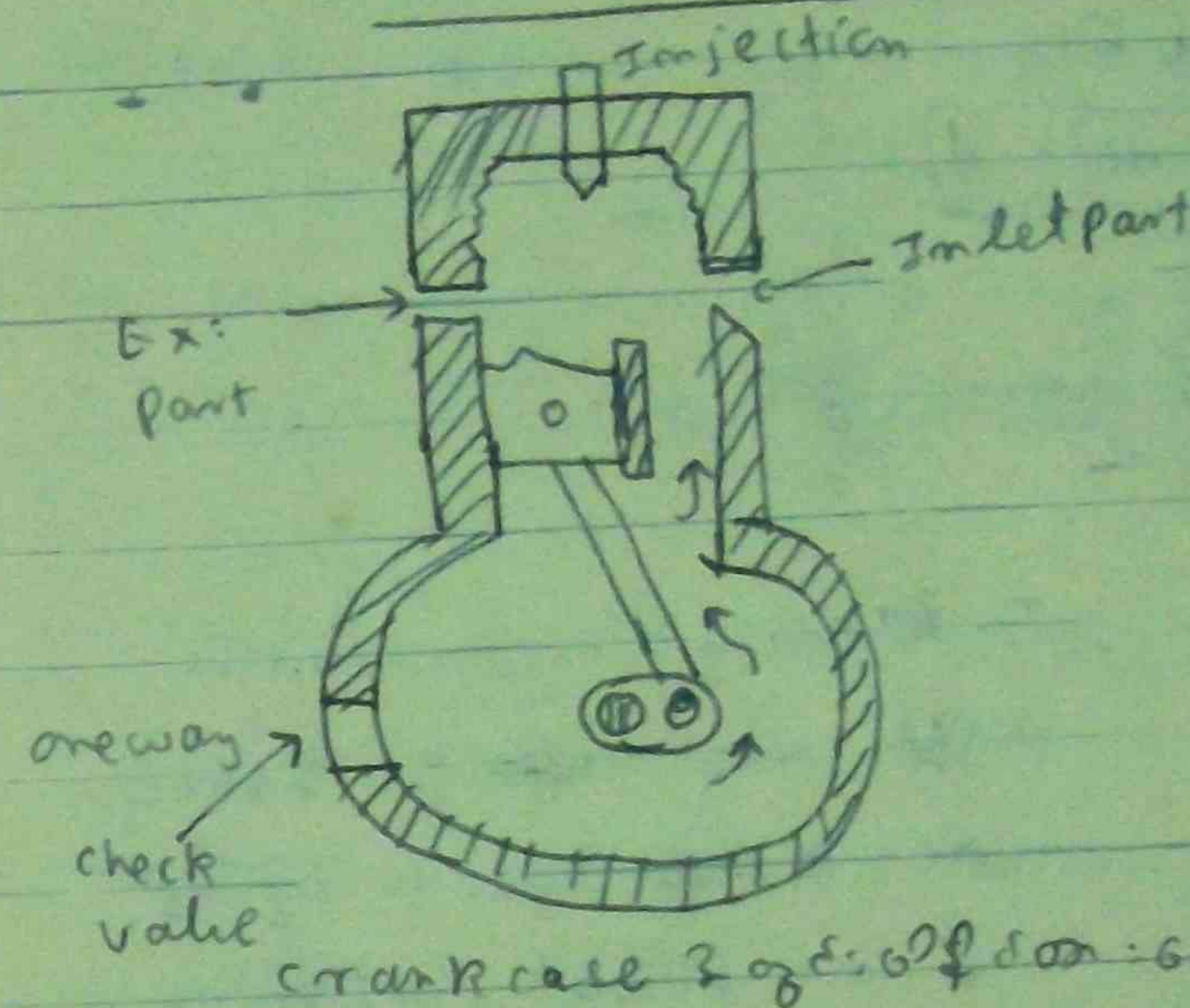
The velocity of air is high velocity air up to 1000 m/s. Exhaust manifold is of the type of ball joint. Blow down period of air

Valve overlap

Inlet valve is of the type of ball joint. Exhaust valve is of the type of ball joint. Valve overlap is of the type of ball joint.

- | | |
|------------------|------------------------------|
| ① Combustion | ⑤ Supercharging (Intake air) |
| ② Exhaust | ⑥ Line |
| ③ Fuel Injection | ⑦ Intake |
| ④ Speed control | |

Two stroke cycle engines



crank case is of the type of ball joint. Piston intake part of the cylinder is of the type of ball joint. Exhaust gas is of the type of ball joint.

Scavenging Two cycle engine

2 cycle engine is of the type of ball joint. 4 cycle engine is of the type of ball joint. Speed of the 2 cycle engine is of the type of ball joint. Power of the 2 cycle engine is of the type of ball joint.

Volumetric efficiency =

cycle of the cylinder is of the type of ball joint. Stroke of the piston is of the type of ball joint.

- crank pin journal bearing: oil is supplied to the crank pin journal bearing.

Inlet

TDC is the point where the piston is at the top of the cylinder. At this point, the air is compressed. High velocity air is supplied to the cylinder during compression.

The air is compressed and the temperature is raised. The air is then injected into the cylinder.

Power

(35%)
TDC is the point where the piston is at the top of the cylinder. At this point, the power is produced.

Exhaust

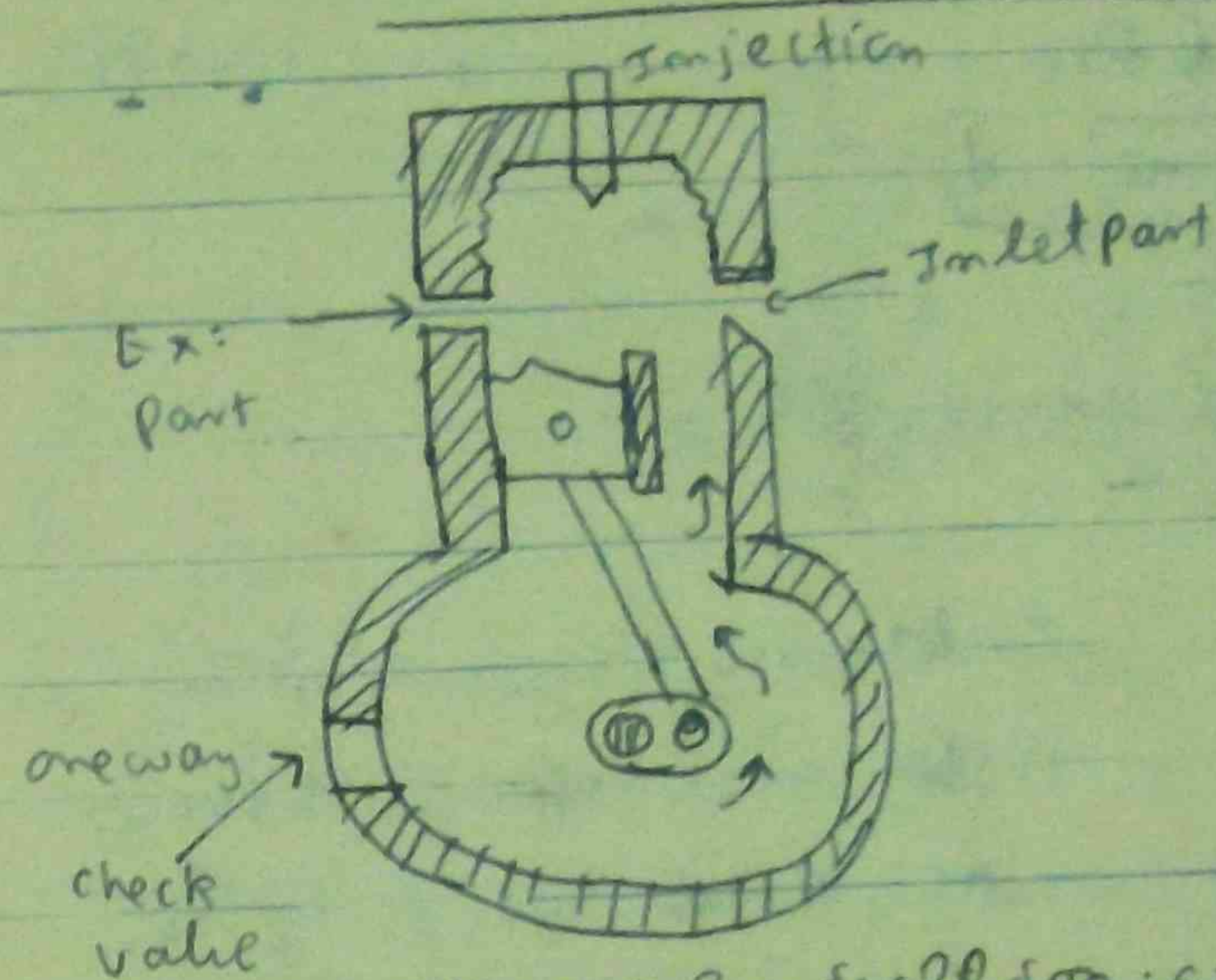
BDC is the point where the piston is at the bottom of the cylinder. At this point, the exhaust valve is open and the exhaust gas is expelled. The exhaust manifold is connected to the cylinder and the exhaust gas is expelled through the manifold.

Value over lap

Inlet valve is open before the exhaust valve is closed. This is called the value over lap. The inlet valve is open 20° before TDC and the exhaust valve is closed 20° after TDC. The value over lap is 40°.

- | | |
|------------------|------------------------------|
| ① Combustion | ⑤ Supercharging (Intake air) |
| ② Exhaust | ⑥ Liner |
| ③ Fuel Injection | ⑦ Maintenance |
| ④ Speed control | |

Two stroke cycle engines



crank case 2 stroke engine: piston intake part of the cylinder is open. Exhaust gas is expelled through the exhaust port. The exhaust gas is expelled through the exhaust port.

Scavenging Two cycle engine

2 cycle engine is 4 cycle engine. The speed of the 2 cycle engine is double the speed of the 4 cycle engine. The power of the 2 cycle engine is double the power of the 4 cycle engine.

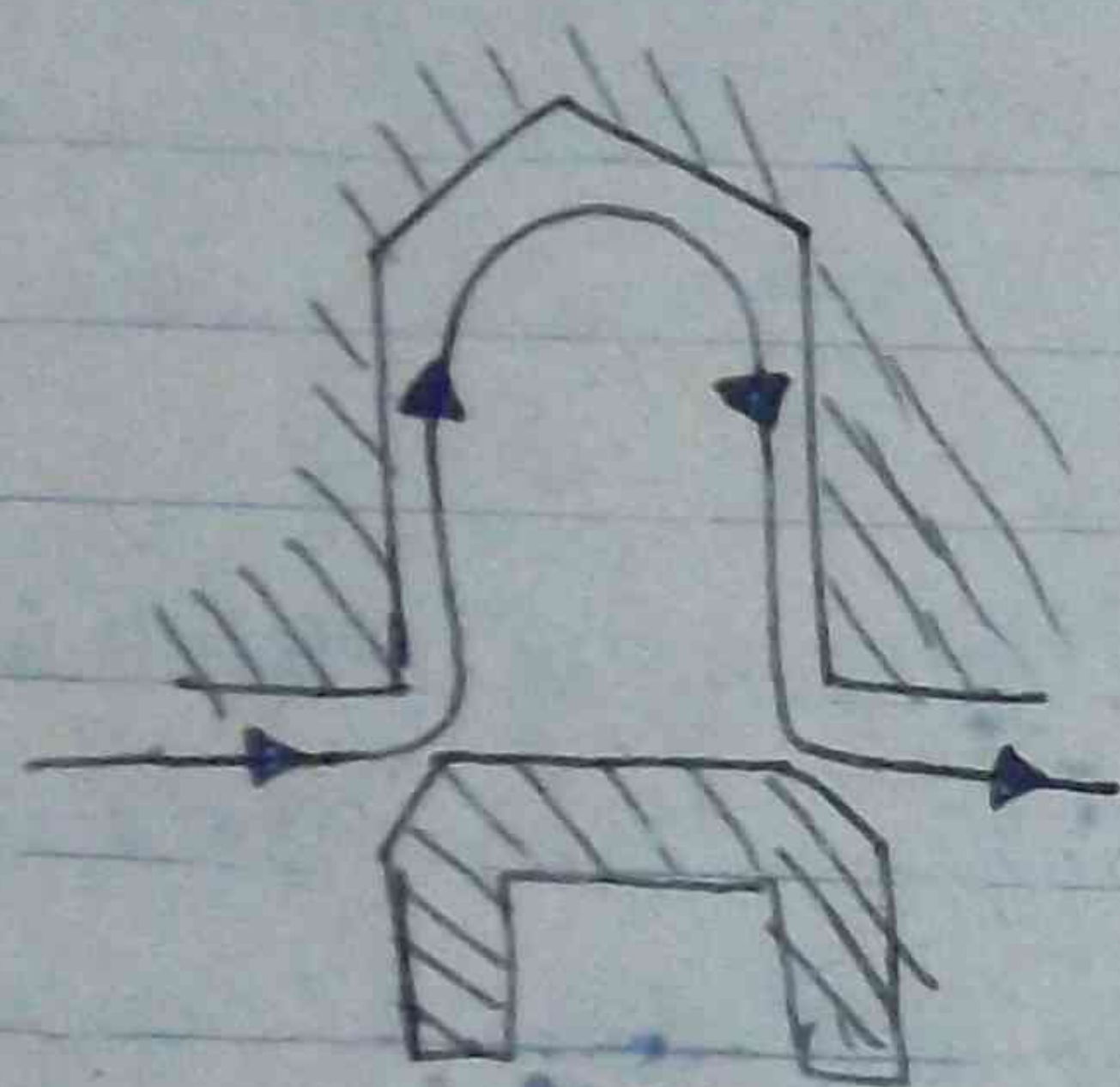
Volumetric efficiency =

cycle air in the cylinder is 2 stroke. The piston is at the bottom of the cylinder. The stroke is 2 stroke. The piston is at the bottom of the cylinder.

cylinder & port of m/c & oil

Part ① Scavenging method

Cross flow scavenging

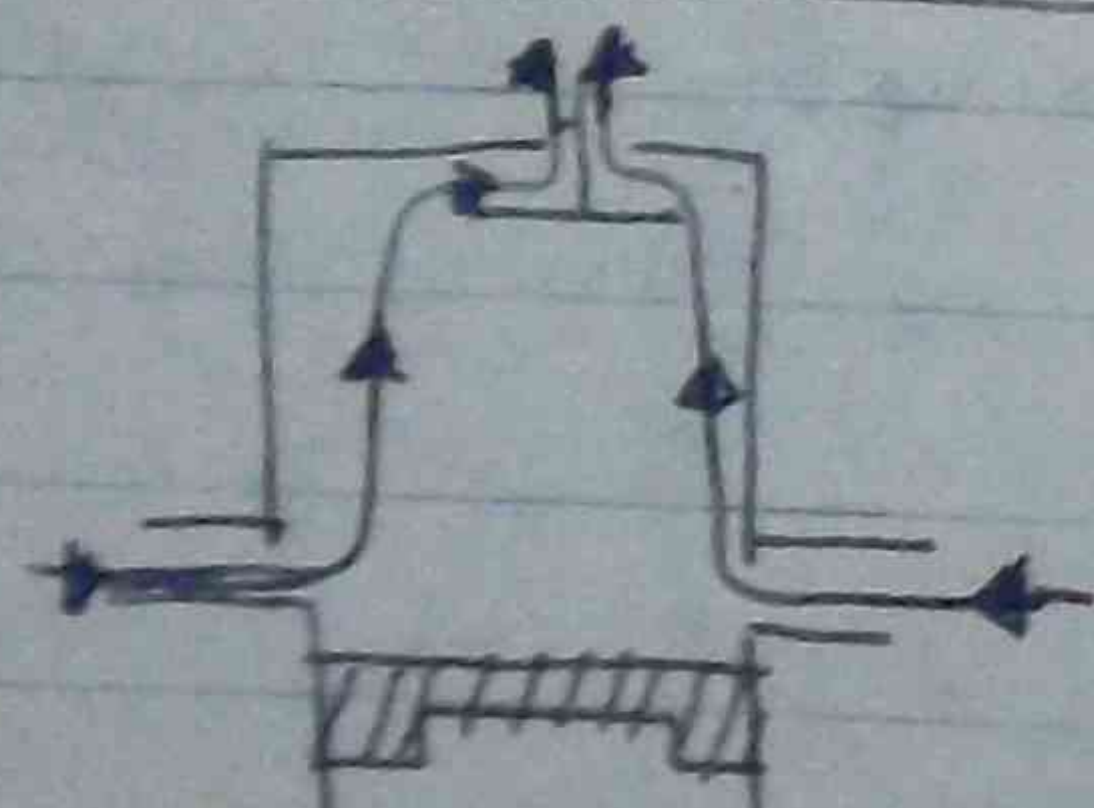


Inlet port of m/c on upper side
Piston cross section of m/c
area of exhaust gas up: m/c
min exhaust port on: m/c
area of m/c: m/c

scavenging of: m/c of Inlet
port on up direction of piston cross section of Design

m/c: m/c

Uni flow scavenging



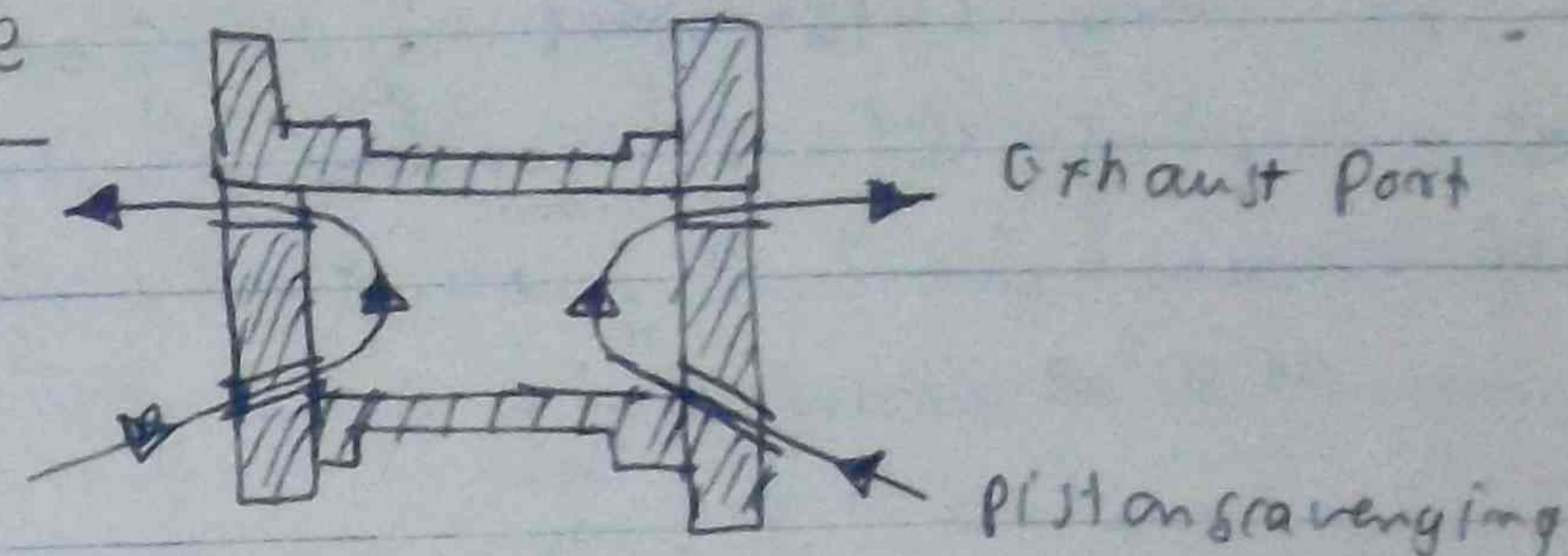
Horizontally opposed engine

area of cylinder m/c: m/c
of m/c of m/c m/c: m/c
area of m/c

cylinder m/c on upper side of m/c
m/c m/c: m/c: cylinder

head of exhaust of ex: gas up: m/c

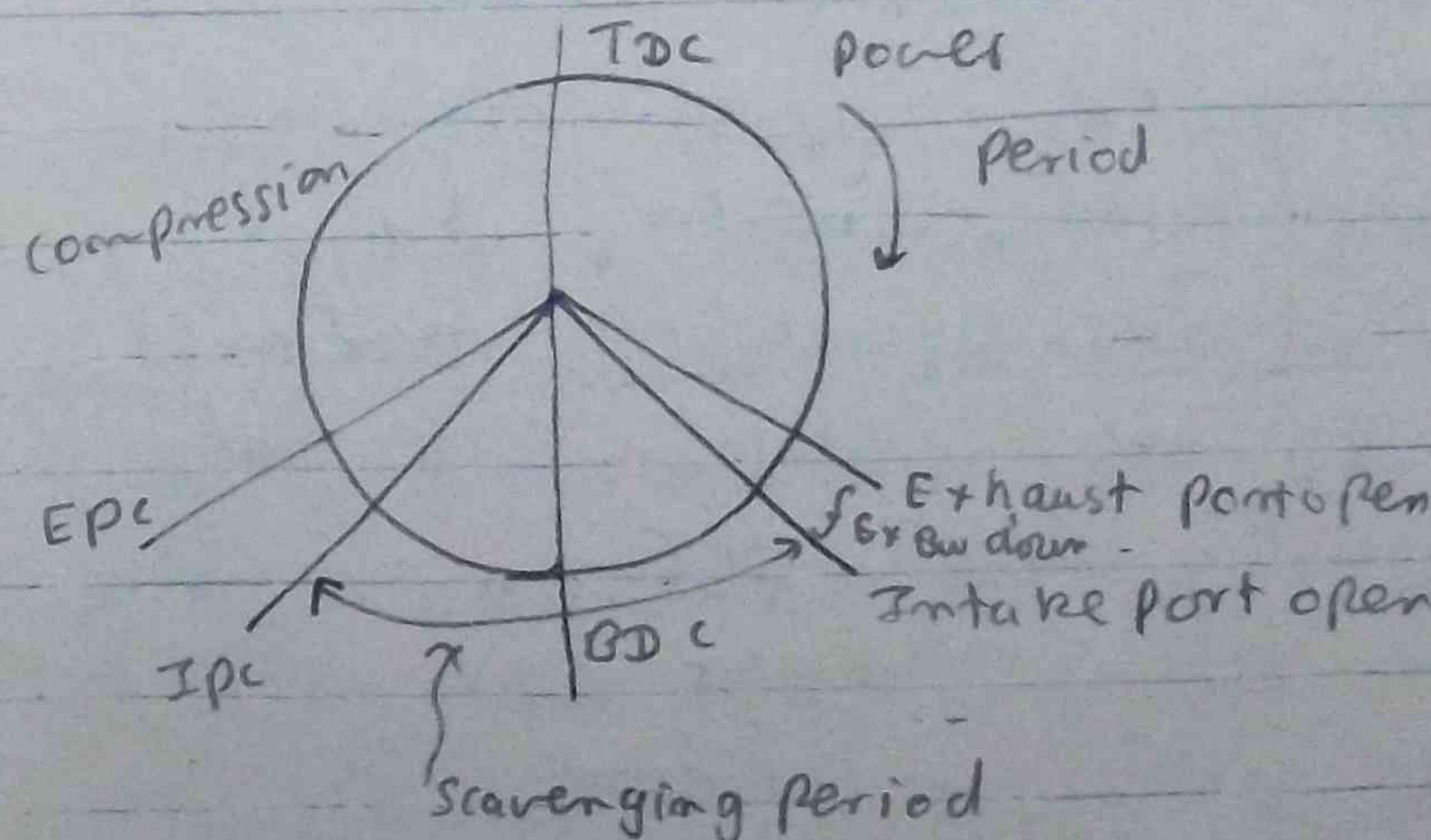
opposed piston engine



— Inlet of, Exhaust port of: m/c
cylinder on m/c of m/c

— m/c m/c of m/c: m/c. Scavenging of m/c of combustion
of m/c: m/c

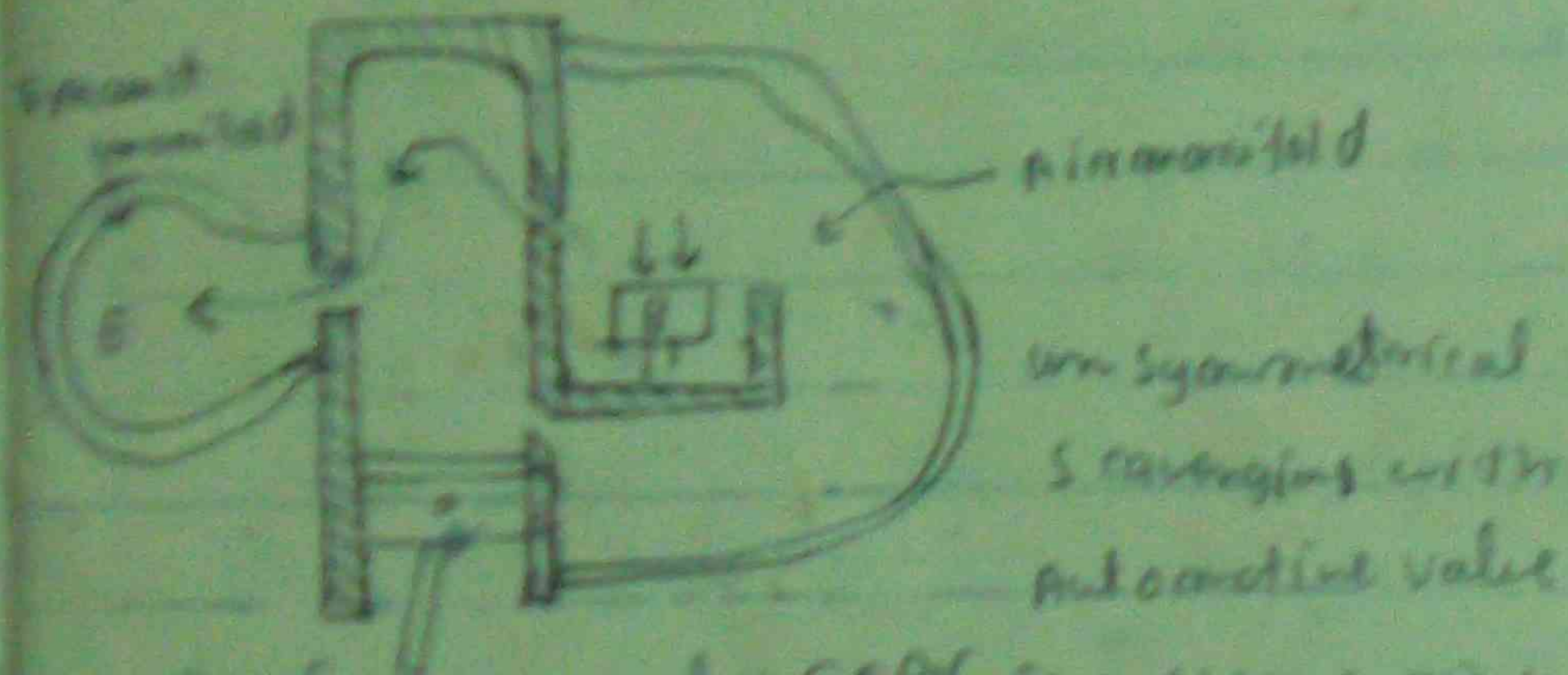
Two cycle part and valve Timing Diagram



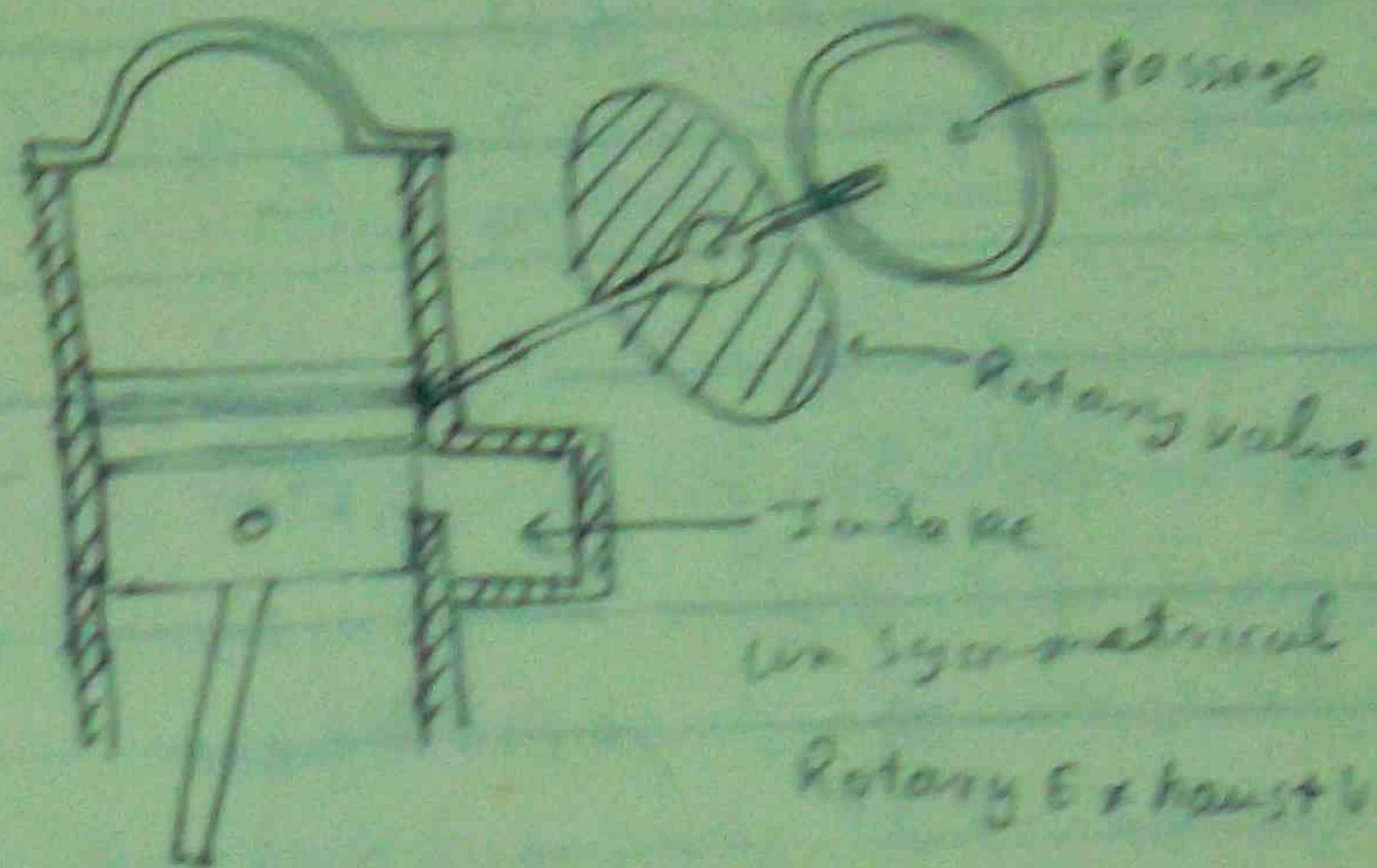
2 stroke cycle engine of piston m/c of m/c: m/c

Exhaust port of m/c: m/c of Intake port of m/c: m/c
m/c: m/c of Exhaust & low down of m/c piston m/c

1. In a 2 stroke engine Intake valve does not open Exhaust
 valve does not open & of 2 stroke. Compression is
 done by Intake valve does. Exhaust valve does not open
 compression is done by Intake passage (or)
 Exhaust manifold. In 2 stroke engine Intake valve opens
 & of 2 stroke engine.

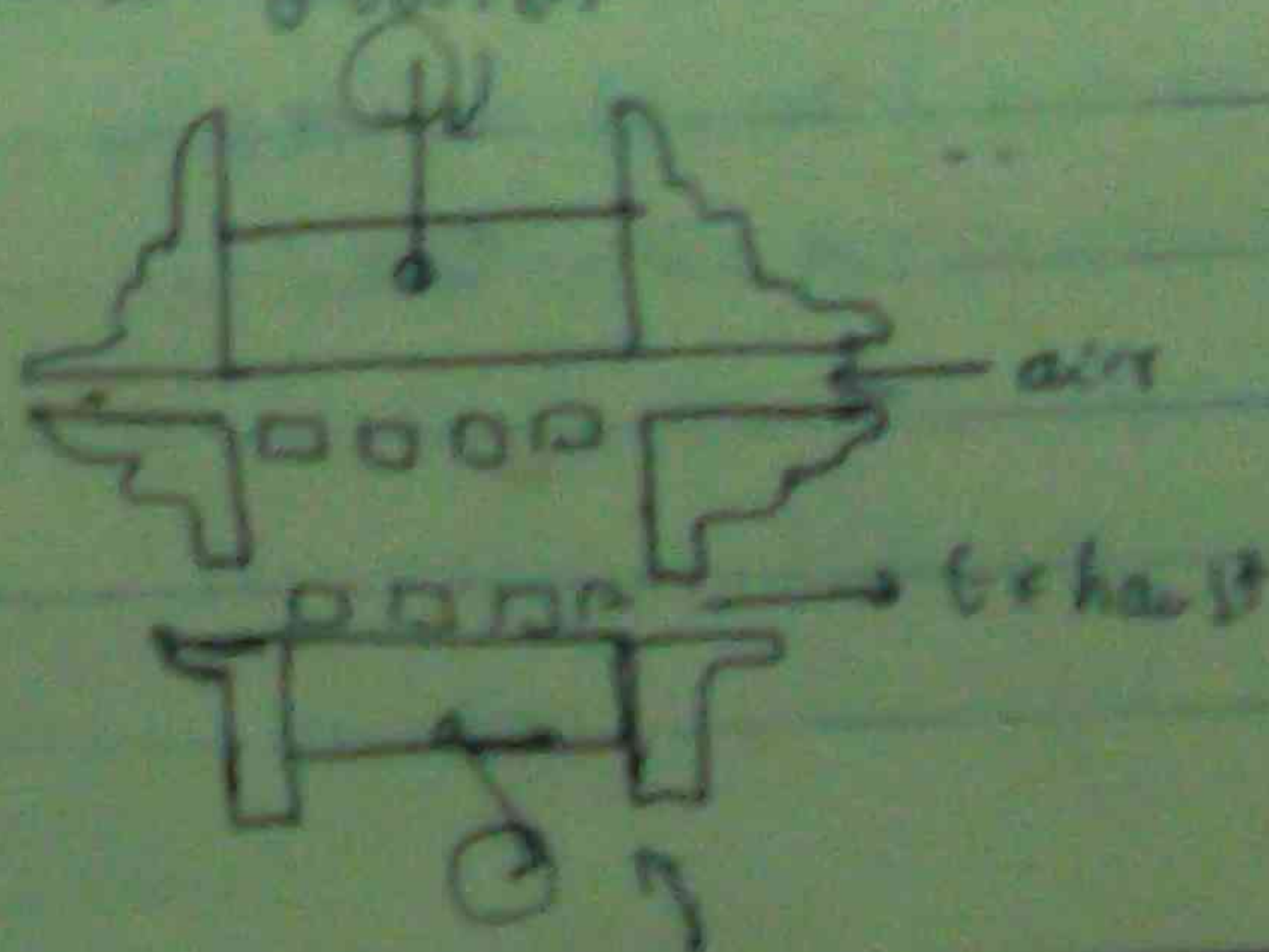


2. In a 4 stroke engine Intake valve opens & of 2 stroke. Compression is
 done by Intake valve does. Exhaust valve does not open
 compression is done by Intake passage (or)
 Exhaust manifold. In 4 stroke engine Intake valve opens
 & of 2 stroke engine.



In a 4 stroke engine Intake valve opens & of 2 stroke. Compression is
 done by Intake valve does. Exhaust valve does not open
 compression is done by Intake passage (or)
 Exhaust manifold. In 4 stroke engine Intake valve opens
 & of 2 stroke engine.

In a 4 stroke engine Intake valve opens & of 2 stroke. Compression is
 done by Intake valve does. Exhaust valve does not open
 compression is done by Intake passage (or)
 Exhaust manifold. In 4 stroke engine Intake valve opens
 & of 2 stroke engine.



Opposed piston engine
 showing lead of
 lower crankshaft

Normally Aspirated and Supercharging
Engine

[illegible]

6- cyl. ~~of~~, ~~cylinder~~ ~~of~~. blower (or) Turbo
charger or exhaust gas (c.c.) and centrifugal
compressor (c.c.) both are at _____

6. now it goes on - 7 sc: timbo charge of 61 - 12.00

Part ② Combustion

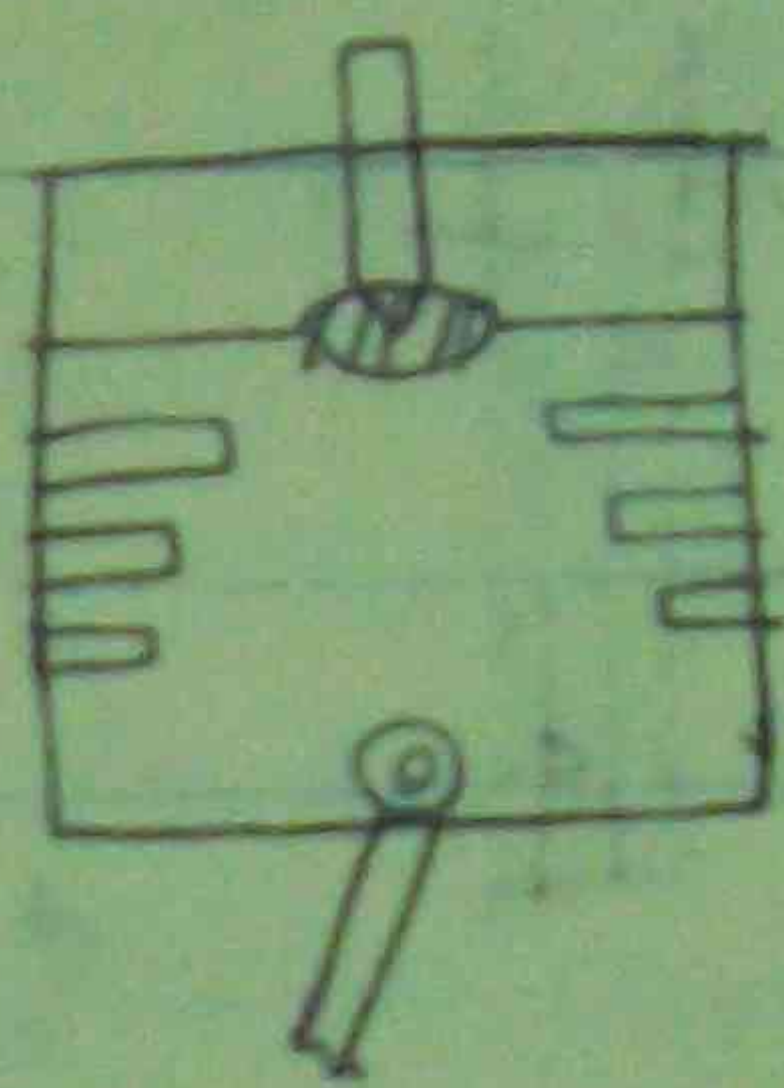
Combustion Chamber Design

Combustion chamber vol: 700 cc; 1/2 in. of 70 cc; 1/2 in. of 70 cc; 1/2 in. of 70 cc

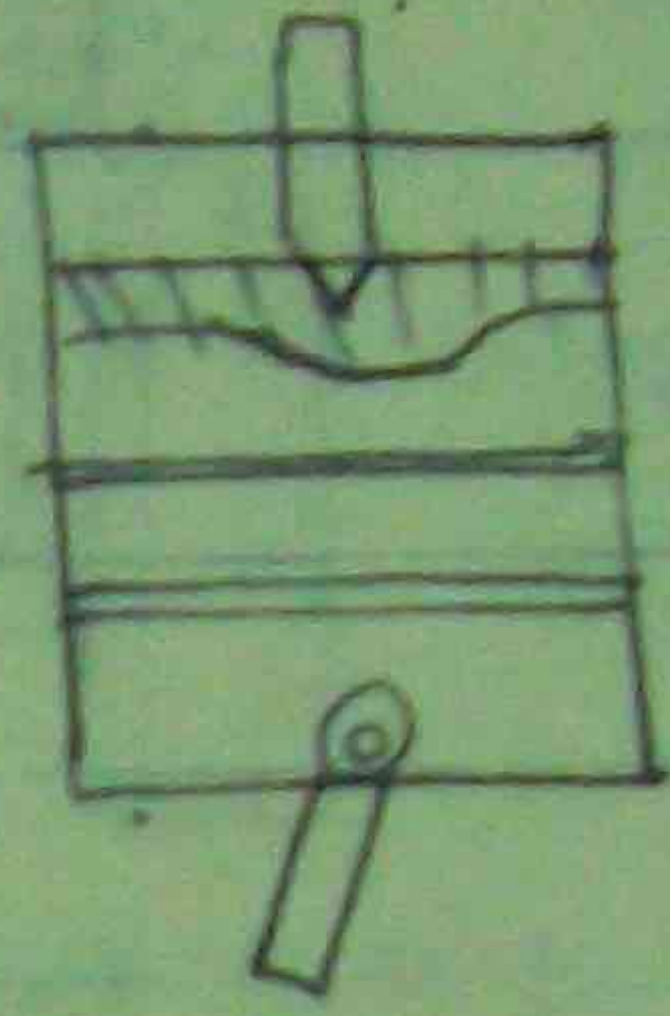
- ① open injection chamber (or) direct injection
- ② pre combustion chamber (or) Quiescent
- ③ Turbulence chamber
- ④ Air-cell (or) orogcell.

Part 1

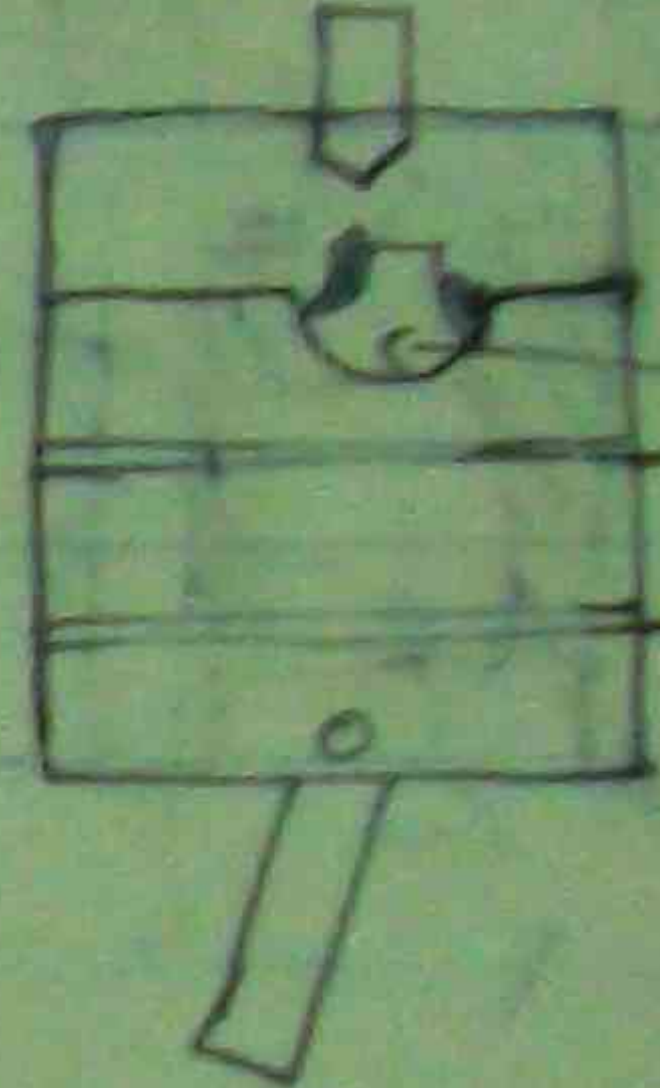
① Open combustion chamber (or) direct injection



(A) cycle Hem. Hem
21 1/2 in x 27 1/2 in

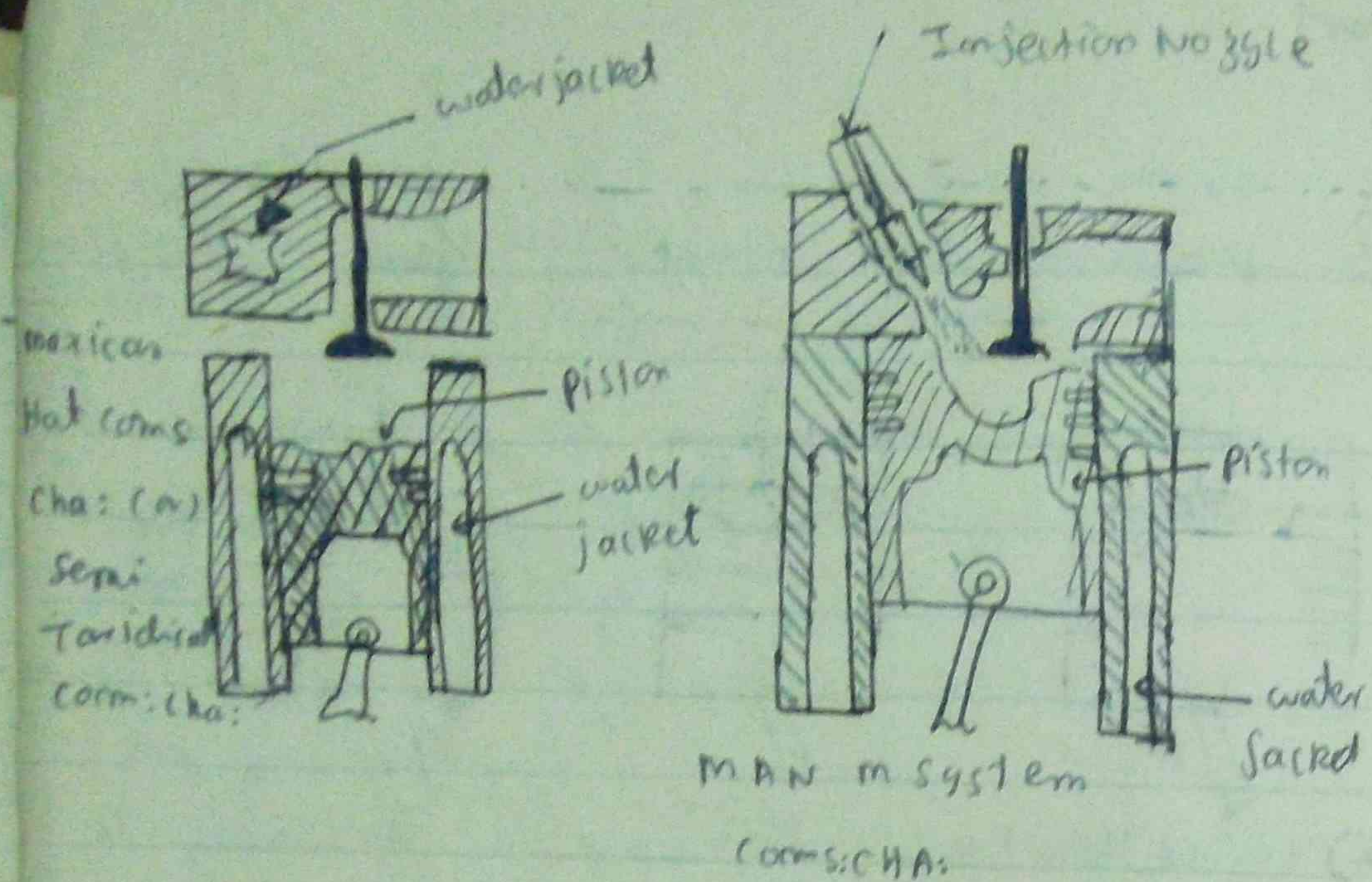


⑧ Four year
also
9 in x 10 1/2 in



Four cycle
complete
Bassmen
Playlein

- (A) for slow speed engine piston, cylinder head & 2 rings are in contact
- (B) for Turbocharge engine
- (C) for 15 1/2 in diametric, 750 r.p.m. centrifugal pump
 Injection nozzle of 2250 r.p.m. engine is 0.1 in
 cylinder head 3/8 in. up. nozzle is sprayed
 combustion chamber 1/2 in. from top. 20% of fuel
 is 6 mm. fuel nozzle 6 mm. from top
 of injection nozzle 0.1 in. from top. 20% of fuel
 is 6 mm. (dead air space) 40% of fuel is 6 mm. Dead air
 space is 6 mm. 20% of fuel is 6 mm. engine up to 1500 r.p.m.
 1500 r.p.m. semi-Toroidal combustion chamber up
 to 1500 r.p.m.

[illegible]

S.C. combustion chamber was 8.0 cm dia. (spherical)
 & nozzle 3.0 cm dia. cylinder of 2.0 cm dia. & 4.5" of 3.0 cm dia. nozzle
 nozzle of 0.015" & gas flow orifice 3.0 cm 2500 psi pressure of
 spherical combustion chamber 6.0 cm dia. Tangential direction
 of 6.0 cm dia. High speed camera 7.0 cm dia. 5000 psi

SE system @ 2730 m/s. High velocity
incidence of up to 60° on SE, of directional particle.

mark value oil induce Sundt for Piston induce squish
of. $y_2 = 6.1 \times 10^{-2}$

- ① High velocity Turbulence and combustion chamber of
 ၁၀၀၀ မီတာ နီးပါး: ၁၅ မီတာ နီးပါး: ၆၀၀၀ မီတာ
- ② chamber size: ၆၇၀ x ၁၅၀၀ မီတာ: ၁၅၀.၆၀: ၆၀: ၆၀
 ၁၀၀၀ မီတာ: ၆၇၀ x ၁၅၀၀ မီတာ: ၁၅၀.၆၀: ၆၀: ၆၀
- ③ combustion pressure pressure ၁၅: ၁၀၀၀ မီတာ: ၆၇၀
 ၁၀၀၀ မီတာ: ၆၇၀ x ၁၅၀၀ မီတာ: ၁၅၀.၆၀: ၆၀: ၆၀
 ၁၀၀၀ မီတာ: ၆၇၀ x ၁၅၀၀ မီတာ: ၁၅၀.၆၀: ၆၀: ၆၀

- १७ जून १९६७

of 25,000 cc of combustion chamber of
Engine, 7. 50 & gasoline JPH Jet fuel
(or) Diesel diesel 20 of 7. 20 of 60 and 50 of

Intake Induce Air Seiwert

[illegible]

- ② Pre combustion chamber 24:00:

- ③ cylinder cap: of mass m & cyl. body of mass M & radius R .
At top of cyl. vertical rod of length L & air
Passage



(3)

Jet engine used in
working Tom Sawyer engine

for creating Turbulence (Dist)

Intake values are shown
open.

① In medium speed engine of 2 stroke intake valve is in open position in cylinder at top of stroke. In intake valve is closed at bottom of stroke. Exhaust valve is closed at top of stroke and open at bottom of stroke.

(13) val of right speed engine for 2 opert ^{masked} value for 01
 sub, conf 6000 2 op 7000: 01 masked value of 001: 011 of
 value 011 val of 011 001: 011 2 op 11

Time 11:50 AM per 1032 valve replaced 6.00011

The image contains two hand-drawn diagrams. The top diagram shows a bridge with a central arch and a small structure on top. To the right of the bridge is a fraction $\frac{1}{4}$. The bottom diagram shows a wheel with a central hub and spokes. To the left of the wheel is the word "mass" and below it is the word "Zurlet".

Squish highest at about 160T30
just after injection.

4. Turbulance in the compression stroke piston TDC of working cycle most piston edge of cylinder head is surface of piston edge chamber

more of a diff. of ρ (inward) of 60% Turbulence
of 60% diff.

17/2/00 8:11
 1. Piston Squish. Intake Area: Induced Swirl
 2. Turbulence flow 2000. ^{piston} 1000. Chamber
 3. Diameter 100. 100. 100. High velocity 1000

② Precombustion Chamber

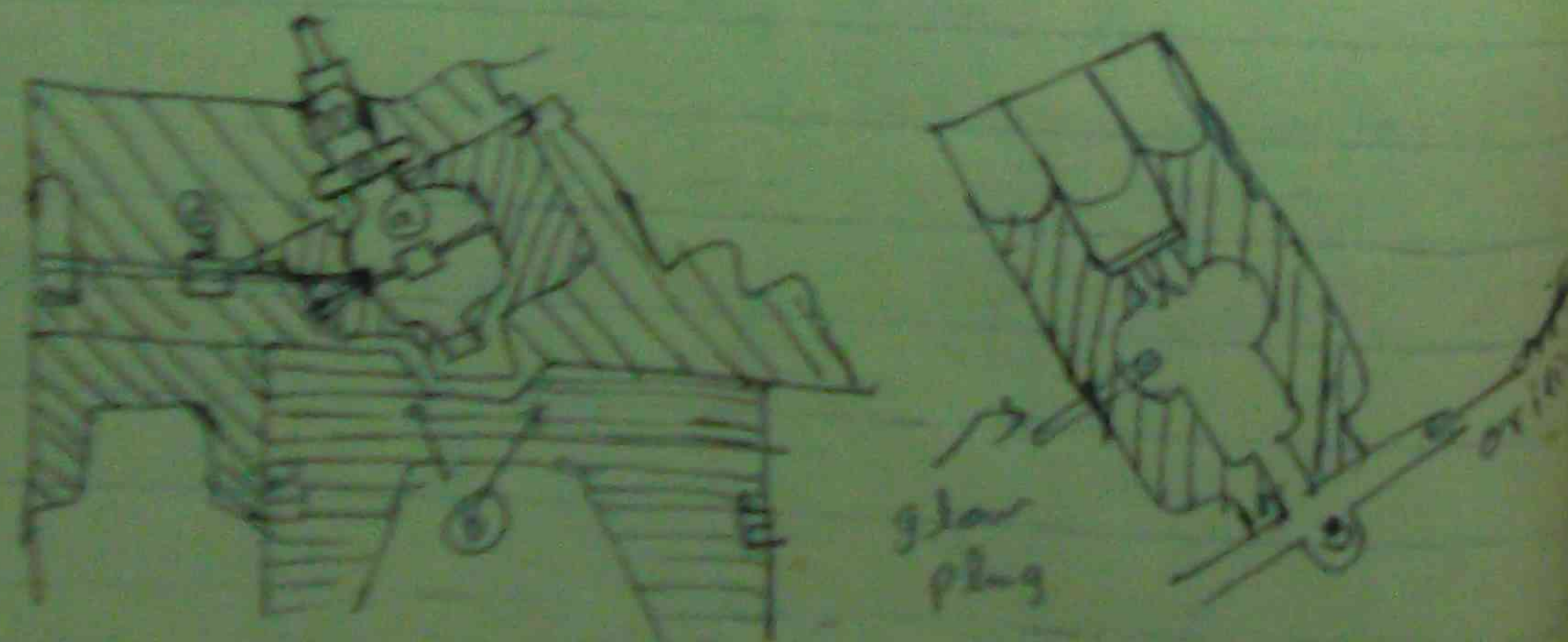
② Pre-combustion chamber

Pre combustion Chamber type medium & High speed engine of ~~or~~ ~~majority of~~ medium and heavy duty engine.

combustion of hydrocarbons fine atomisation
 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.

[illegible]

② Walter Benz pre combustion chamber



- (a) call pin (c) nozzle
 (b) cruise (d) group play

[illegible]

③ caterpillar pre combustion chamber



4. 1st 60°C in: 60°C water pillar pre-combustion
chamber in: water jacket of 1st of cylinder
head in: 20. 2 20 20 20 20 20 20 20 20 20
Chamber 0.1 20 in 2 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20

7. In a simple jet engine, the air is compressed by a compressor. The compressed air is then heated by the combustion of fuel in the combustion chamber. The hot gases expand through a turbine, which drives the compressor. The exhaust gases are then exhausted through a nozzle, which produces thrust.

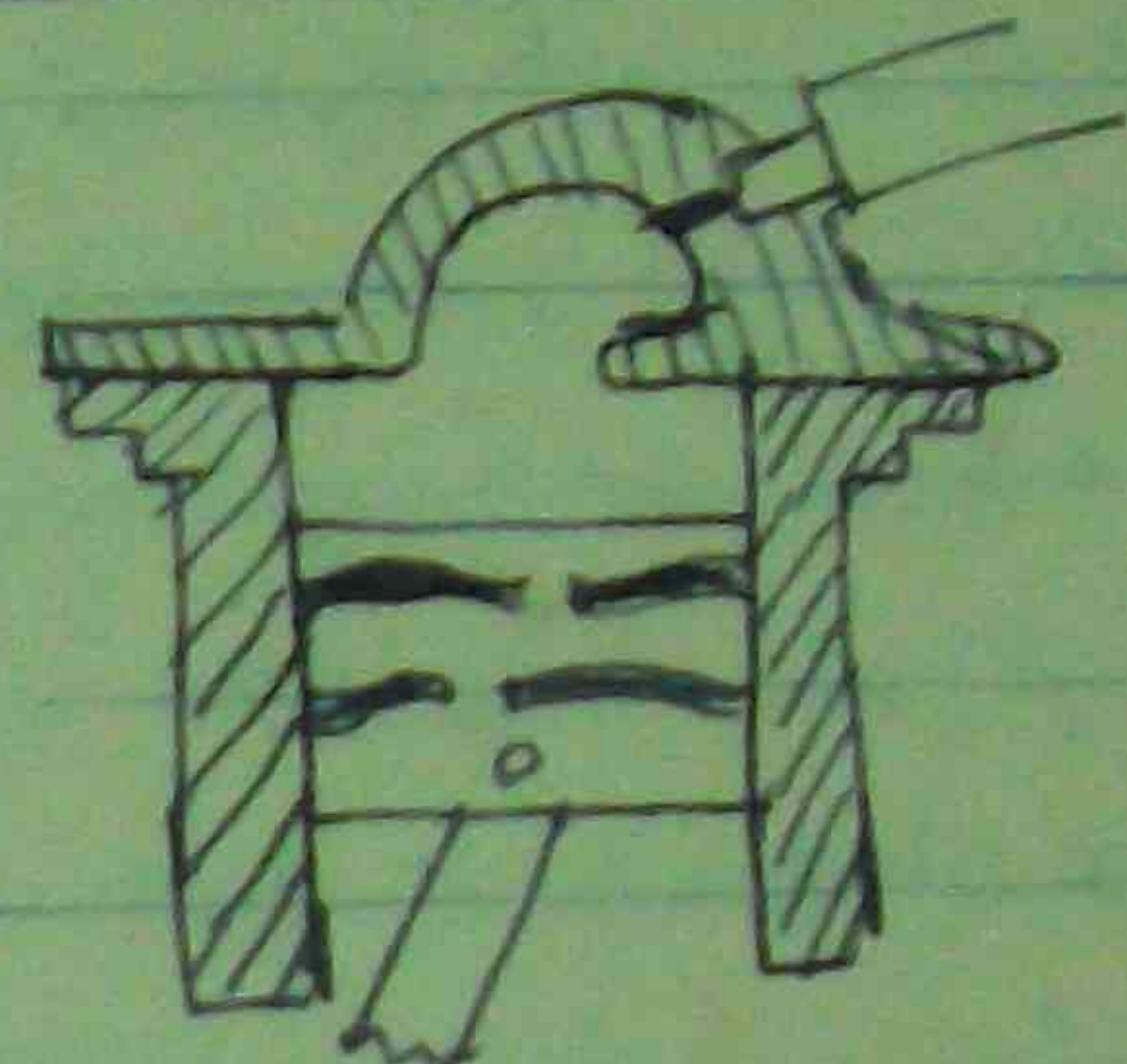
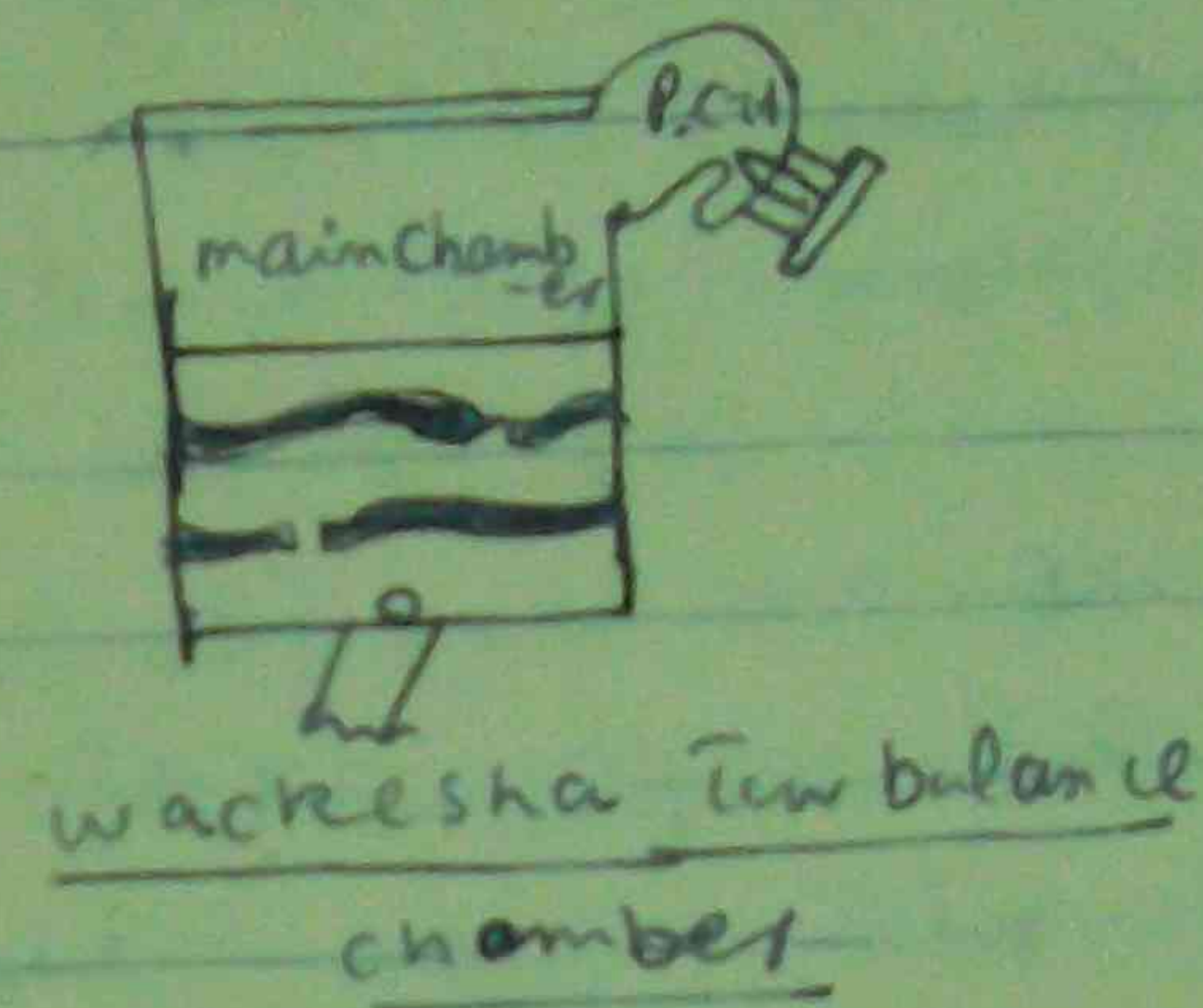
③ M.W.M. Pre combustion chamber



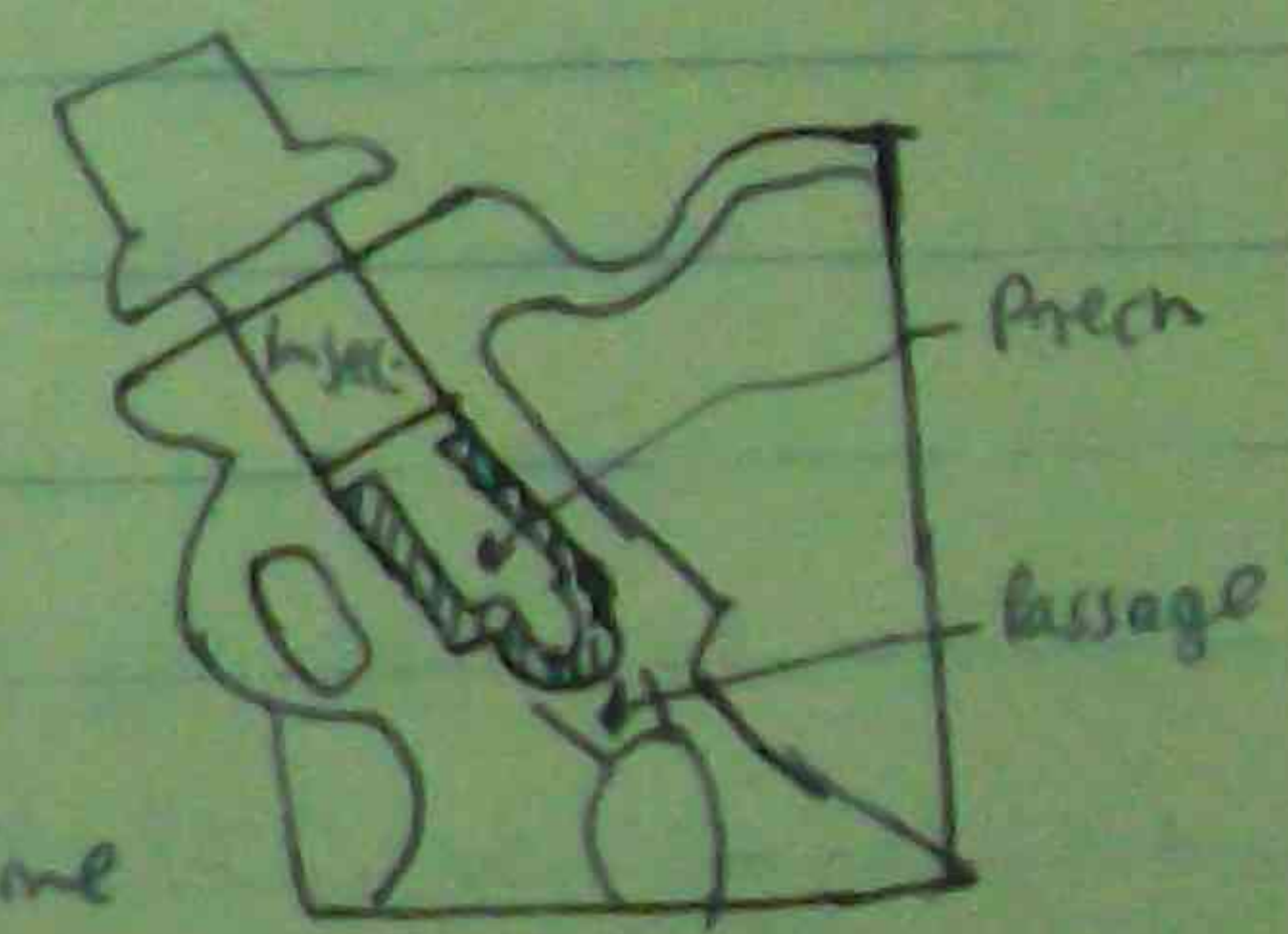
a = Inner venturi
b = outer Annulus

1. Throat diameter of venturi must be 0.6 in.
2. Annulus 0.6 in. diameter
3. Main chamber 1.5 in. diameter
4. Low velocity of 600 ft/min
5. Throat 0.6 in. diameter, of cast steel up to 1000 psi
6. Injection nozzle 0.6 in. diameter, 1000 psi
7. Spray 0.6 in. diameter, 1000 psi
8. Throat 0.6 in. diameter, 1000 psi
9. Annulus 0.6 in. diameter, 1000 psi
10. Pressure 1000 psi
11. Peak pressure 1000 psi

③ Turbulance pre combustion chamber



Hispano Suiza combustion chamber is used on some Hercules engine models



Turbulence chamber 1.5 in. diameter, 1000 psi
2. Harvester's Turbulance chamber 1.5 in. diameter
3. Main chamber 1.5 in. diameter
4. Spray 0.6 in. diameter, 1000 psi
5. Throat 0.6 in. diameter, 1000 psi
6. Annulus 0.6 in. diameter, 1000 psi
7. Pressure 1000 psi
8. Peak pressure 1000 psi

High Temperature 3700-5600 m. J. G. or G. G. H.
water jacket of tube 2000-3500 m.

ଉପରୋକ୍ତ ଲେଖକଙ୍କ ନାମରେ କୌଣସି ଗ୍ରନ୍ଥ ଗୋଟିଏ ଶିକ୍ଷା ଦେଉଥିବା କିମ୍ବା

Turbulence chamber nozzle of nozzle of 60 g/min
and nozzle for combustion of main chamber of

Turbulence chamber @ 1000: 600: 200 mm of diameter.
If High velocity flow of water is over piston T.D.C
of motor of 200 High velocity Turbulence of water is over piston

Wanklesha Diesel Engine of 2000 cc Turbulance
chamber of 400 cc or 800 cc - of main chamber of 2000
cc or 4000 cc Tangential orifice of 0.5 mm or 1 mm of
High velocity Turbulance 6000 rpm - Air pre heat combustion
chamber 2000 cc or 4000 cc High Temperature 500°C, 700°C or 800°C
or 900°C. Steelite or 100% Cr or 100% Ni or 100% Co or 100% Fe or 100% Cu
injection of 0.5 mm or 1 mm of Air pre heat combustion chamber
of 2000 cc or 4000 cc Piston 1000 cc or 2000 cc or 4000 cc or 8000 cc
or 16000 cc. 2000 cc Turbulance of 0.5 mm or 1 mm of engine
of 2000 cc or 4000 cc or 8000 cc or 16000 cc or 32000 cc or 64000 cc
or 128000 cc or 256000 cc or 512000 cc or 1024000 cc or 2048000 cc or 4096000 cc or 8192000 cc or 16384000 cc or 32768000 cc or 65536000 cc or 131072000 cc or 262144000 cc or 524288000 cc or 1048576000 cc or 2097152000 cc or 4194304000 cc or 8388608000 cc or 16777216000 cc or 33554432000 cc or 67108864000 cc or 134217728000 cc or 268435456000 cc or 536870912000 cc or 1073741824000 cc or 2147483648000 cc or 4294967296000 cc or 8589934592000 cc or 17179869184000 cc or 34359738368000 cc or 68719476736000 cc or 137438953472000 cc or 274877906944000 cc or 549755813888000 cc or 1099511627776000 cc or 2199023255552000 cc or 4398046511104000 cc or 8796093022208000 cc or 17592186044416000 cc or 35184372088832000 cc or 70368744177664000 cc or 140737488355328000 cc or 281474976710656000 cc or 562949953421312000 cc or 1125899906842624000 cc or 2251799813685248000 cc or 4503599627370496000 cc or 9007199254740992000 cc or 18014398509481984000 cc or 36028797018963968000 cc or 72057594037927936000 cc or 144115188075855872000 cc or 288230376151711744000 cc or 576460752303423488000 cc or 1152921504606846976000 cc or 2305843009213693952000 cc or 4611686018427387904000 cc or 9223372036854775808000 cc or 18446744073709551616000 cc or 36893488147419103232000 cc or 73786976294838206464000 cc or 147573952589676412928000 cc or 295147905179352825856000 cc or 590295810358705651712000 cc or 1180591620717411303424000 cc or 2361183241434822606848000 cc or 4722366482869645213696000 cc or 9444732965739290427392000 cc or 18889465931478580854784000 cc or 37778931862957161709568000 cc or 75557863725914323419136000 cc or 151115727451828646838272000 cc or 302231454903657293676544000 cc or 604462909807314587353088000 cc or 1208925819614629174706176000 cc or 2417851639229258349412352000 cc or 4835703278458516698824704000 cc or 9671406556917033397649408000 cc or 19342813113834066795298816000 cc or 38685626227668133590597632000 cc or 77371252455336267181195264000 cc or 154742504910672534362390528000 cc or 309485009821345068724781056000 cc or 618970019642690137449562112000 cc or 1237940039285380274899124224000 cc or 2475880078570760549798248448000 cc or 4951760157141521099596496896000 cc or 9903520314283042199192993792000 cc or 19807040628566084398385987584000 cc or 39614081257132168796771975168000 cc or 79228162514264337593543950336000 cc or 158456325028528675187087900672000 cc or 316912650057057350374175801344000 cc or 633825300114114700748351602688000 cc or 1267650600228229401496703205376000 cc or 2535301200456458802993406410752000 cc or 5070602400912917605986812821504000 cc or 10141204801825835211973625643008000 cc or 20282409603651670423947251286016000 cc or 40564819207303340847894502572032000 cc or 81129638414606681695789005144064000 cc or 162259276829213363391578010288128000 cc or 324518553658426726783156020576256000 cc or 649037107316853453566312041152512000 cc or 1298074214633706907132624082305024000 cc or 2596148429267413814265248164610048000 cc or 5192296858534827628530496329220096000 cc or 10384593717069655257060992658440192000 cc or 20769187434139310514121985316880384000 cc or 41538374868278621028243970633760768000 cc or 83076749736557242056487941267521536000 cc or 166153499473114484112975882535043072000 cc or 332306998946228968225951765070086144000 cc or 664613997892457936451903530140172288000 cc or 1329227995784915872903807060280344576000 cc or 2658455991569831745807614120560689152000 cc or 5316911983139663491615228241121378304000 cc or 10633823966279326983230456482242756608000 cc or 21267647932558653966460912964485513216000 cc or 42535295865117307932921825928971026432000 cc or 85070591730234615865843651857942052864000 cc or 170141183460469231731687303715884105728000 cc or 340282366920938463463374607431768211456000 cc or 680564733841876926926749214863536422912000 cc or 1361129467683753853853498429727072845824000 cc or 2722258935367507707706996859454145691648000 cc or 5444517870735015415413993718908291383296000 cc or 10889035741470030830827987437816582766592000 cc or 21778071482940061661655974875633165533184000 cc or 43556142965880123323311949751266331066368000 cc or 87112285931760246646623899502532662132736000 cc or 174224571863520493293247799005065324265472000 cc or 348449143727040986586495598010130648530944000 cc or 6968982874540819731729911960202612

International Harvester Diesel Engine of 22-61600
Turbulence chamber in 4 of 6000 or 10000 of main
chamber. Turbulence chamber of 2000 or 10000

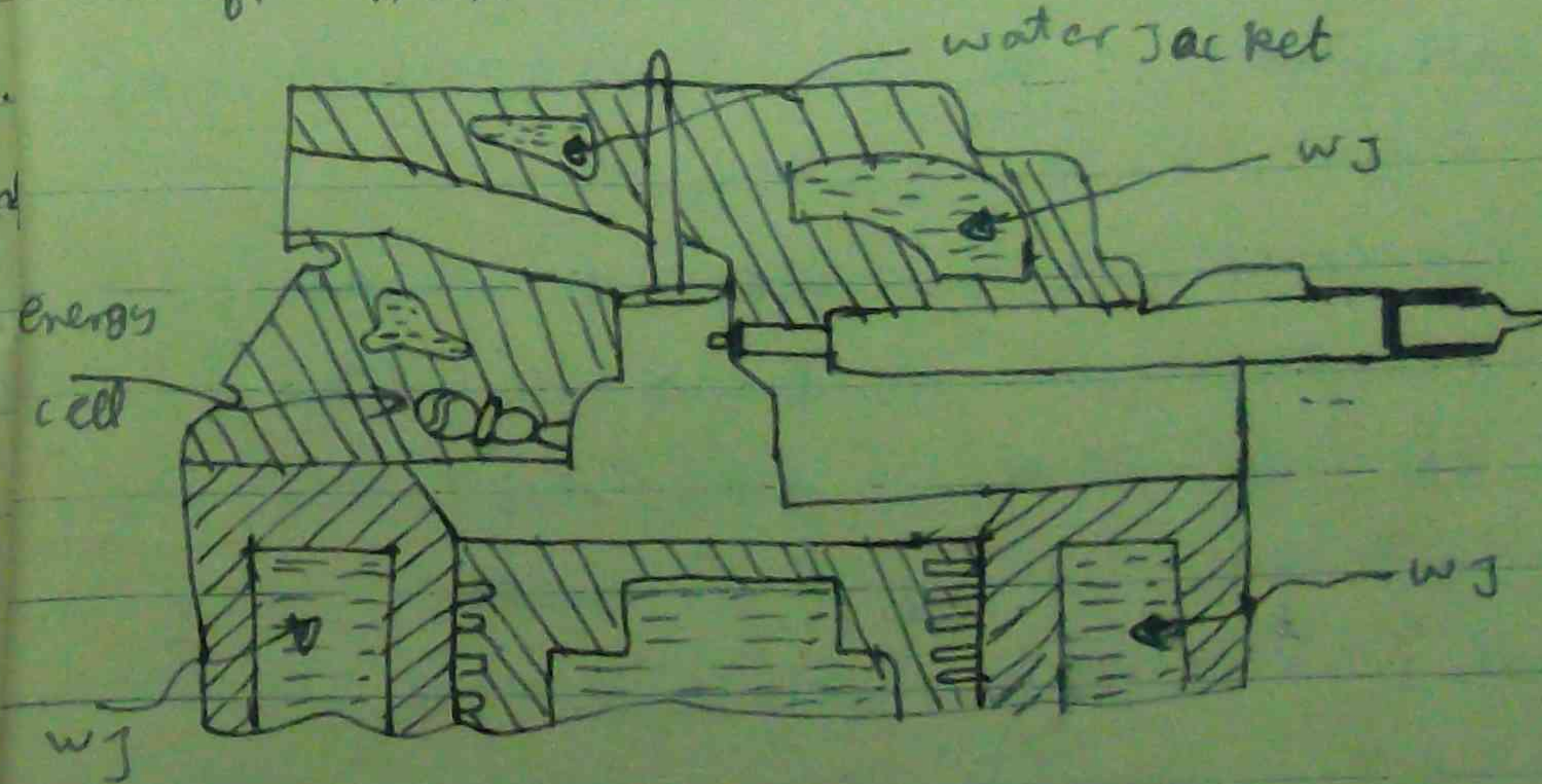
6 of 6 on Taper passage on a (gr). on a (gr): 225 + pre-combust.
chamber 20 of 22 on a (gr): 6 of 6 on a (gr): 225 chamber of

Axial compression ratio: 20:1, 20:1, 62:1, 75:1, 100:1, 100:1
of 6000. Compression ratio of 20:1, 20:1, 62:1, 75:1, 100:1.
Nozzle pre-combustion chamber or
cylinder head pocket or nozzle or 75:1, 100:1.

④ Air cell (or) energy cell

of 7 cylinders: combustion chamber 225 cc cylinder

Head of main chamber and nozzle off of, not
mover. Anti-chamber and nozzle off.

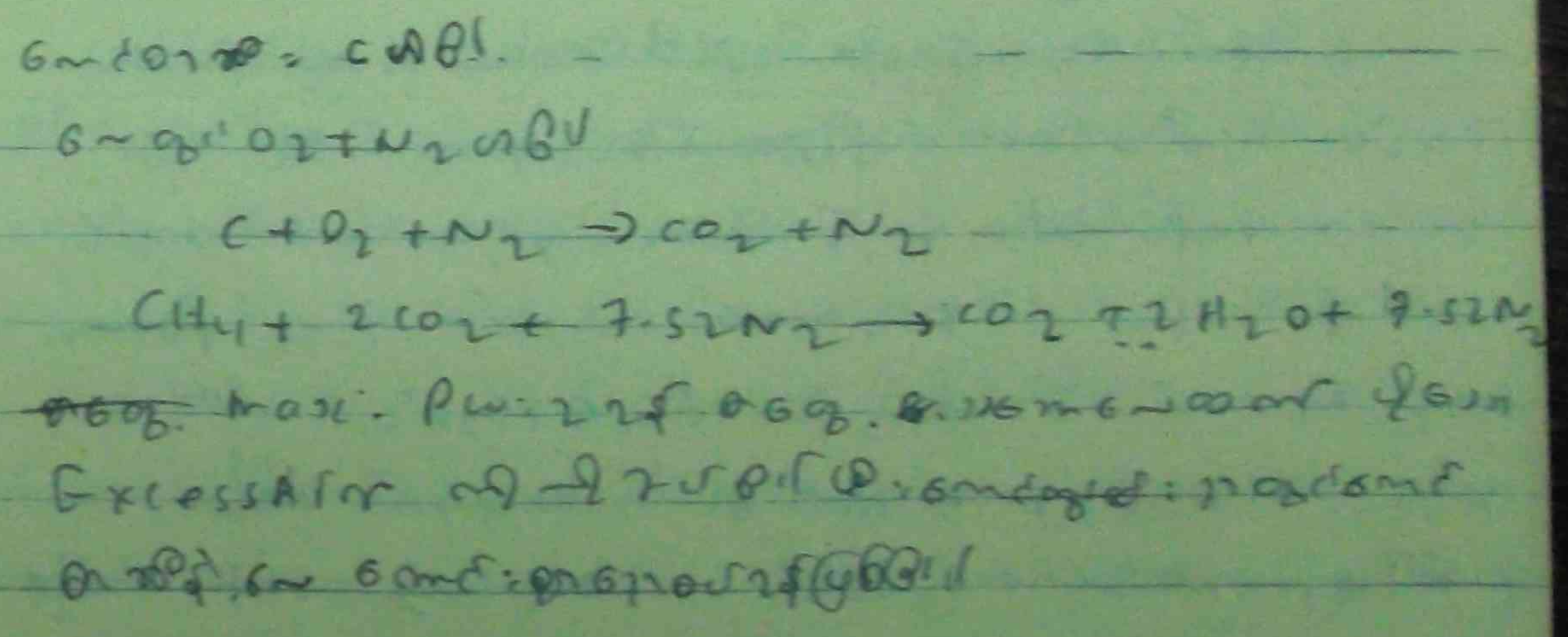


1. Air cell 2. High speed Diesel Engine
 3. Energy cell 4. High speed Diesel Engine
 5. High speed Diesel Engine
 6. High speed Diesel Engine
 7. High speed Diesel Engine
 8. High speed Diesel Engine
 9. High speed Diesel Engine
 10. High speed Diesel Engine

- ① open combustion chamber & Turbulance chamber
- ② pre-combustion chamber engine up: 2.5 m/s
- ③ open combustion chamber & Turbulance chamber

High peak pressure within combustion chamber
 1. High peak pressure within combustion chamber
 2. High peak pressure within combustion chamber
 3. High peak pressure within combustion chamber
 4. High peak pressure within combustion chamber
 5. High peak pressure within combustion chamber
 6. High peak pressure within combustion chamber
 7. High peak pressure within combustion chamber
 8. High peak pressure within combustion chamber
 9. High peak pressure within combustion chamber
 10. High peak pressure within combustion chamber

1. High peak pressure within combustion chamber
 2. High peak pressure within combustion chamber
 3. High peak pressure within combustion chamber
 4. High peak pressure within combustion chamber
 5. High peak pressure within combustion chamber
 6. High peak pressure within combustion chamber
 7. High peak pressure within combustion chamber
 8. High peak pressure within combustion chamber
 9. High peak pressure within combustion chamber
 10. High peak pressure within combustion chamber



Combustion in Diesel Engine

Model engine up: O_2 compression stroke piston T. D. C. up
 2nd stage: O_2 nozzle y d o f: 1 chamber 2nd
 3rd stage: O_2 nozzle y d o f: 1 chamber 2nd
 4th stage: O_2 nozzle y d o f: 1 chamber 2nd
 5th stage: O_2 nozzle y d o f: 1 chamber 2nd
 6th stage: O_2 nozzle y d o f: 1 chamber 2nd
 7th stage: O_2 nozzle y d o f: 1 chamber 2nd
 8th stage: O_2 nozzle y d o f: 1 chamber 2nd
 9th stage: O_2 nozzle y d o f: 1 chamber 2nd
 10th stage: O_2 nozzle y d o f: 1 chamber 2nd

- [illegible]

2. Rapid combustion of piston

[illegible]

Factors affecting Ignition Delay

የ. 0 ~ 1 4 ኃይል. ከጠንቃቄ ይገኛል

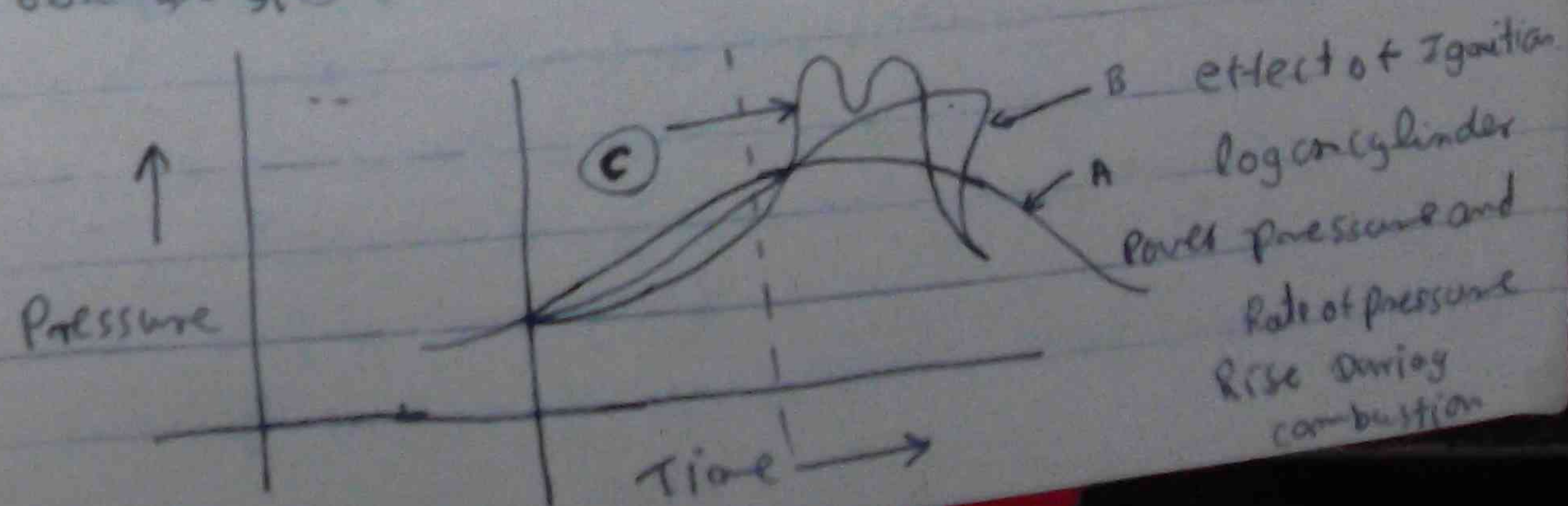
- ① Engine Design ② Condenser ③ Compressor
Fan: 6V 4.5A

- [illegible]

Drop let size (approximation)

Combustion chamber height, h_c , of: $h_c = \frac{V_c}{A_c}$ where V_c is the volume of the combustion chamber and A_c is the cross-sectional area of the combustion chamber.

1. 1947-48. 1947-48. 6th 6th 6th 6th 6th
 2. 1948-49. 1948-49. 7th 7th 7th 7th 7th
 3. 1949-50. 1949-50. 8th 8th 8th 8th 8th



upon injection pressure of 40, or 60

Combustion chamber 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. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841. 842. 843. 844. 845. 846. 847. 848. 849. 850. 851. 852. 853.

③ Temperature

[illegible]

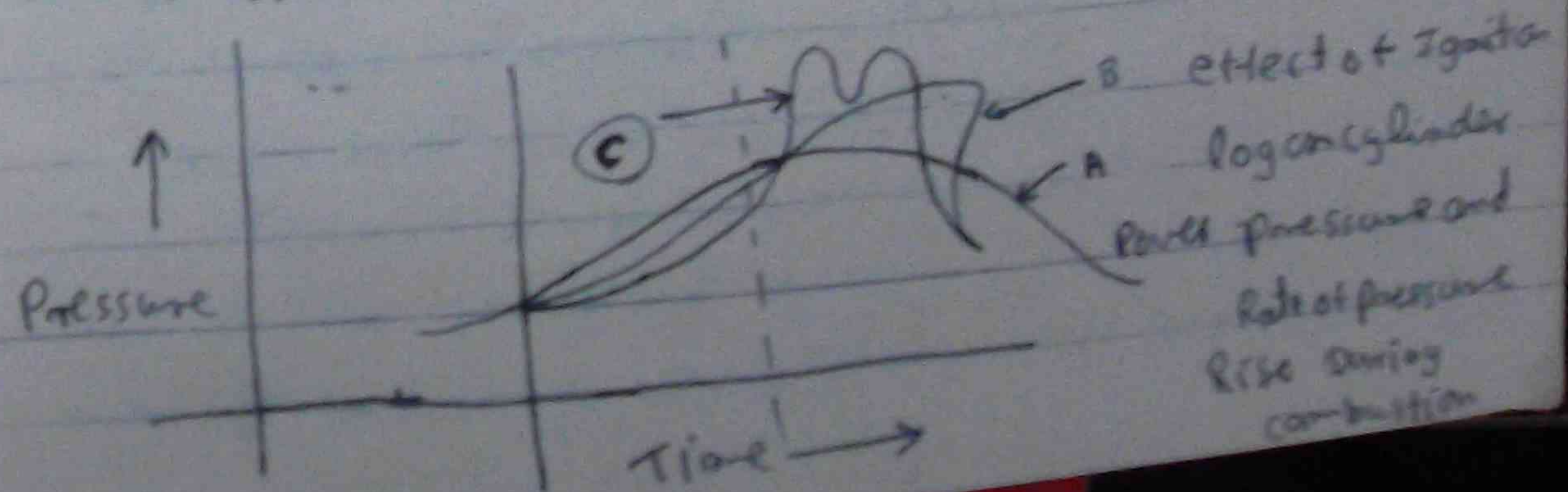
6.2 compression pressure

୧୫ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ
 ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ
 ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ ଶ୍ରୀମତୀ

Auto Ign: Temp: of A Typical T.D

fuel oil compared to gasoline

compression Temperature Turbulence

[illegible][illegible]

[illegible]

1. Delay period: The time interval between the spark discharge and the start of combustion. It is the time taken for the flame to start burning the mixture. It is the time taken for the flame to start burning the mixture. It is the time taken for the flame to start burning the mixture.

Part 3

Exhaust Gas composition

complete combustion of CO or CO_2 , H_2O , O_2 , N_2 or.

④ compression & ignition engine up: up or complete combustion up ⑥ ⑦ ⑧ ⑨ 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 —

(1) compression stroke 2-1: 0-1 cylinder 2 0-1: 0-1 & P.V.C.
6 m 6 m 7 u 8 f 9 d 10 f: 11 f:

② Pre-Flame Reaction $\gamma_{O_2} = 0.465$ (26.5% of O_2 in the mixture). $\gamma_{CO_2} = 0.465$ (26.5% of CO_2 in the mixture). $\gamma_{H_2O} = 0.465$ (26.5% of H_2O in the mixture).

③ complete combustion of C_2H_2 & O_2 & CO_2 :

④ compression Ignition engine or Oil Exhaust Gas or
 20% water gas or 26% CO, Aldehydes 75% car water
 60% 70% 50% 50% 50% carbon or 100% oil

Smoke Limit And Exhaust Smoke

6m for 20 g/l, 6 m diff. (Fuel / Air Ratio) for more fuel
if it is more than Exhaust gas or even if it is less of aldehyde
cost. It is smoke up: 100% for 100%.

[illegible]

0.272 gms (corrected) of fuel of injec. type. 68.

(Timing)

- [illegible]

Types of Injection system

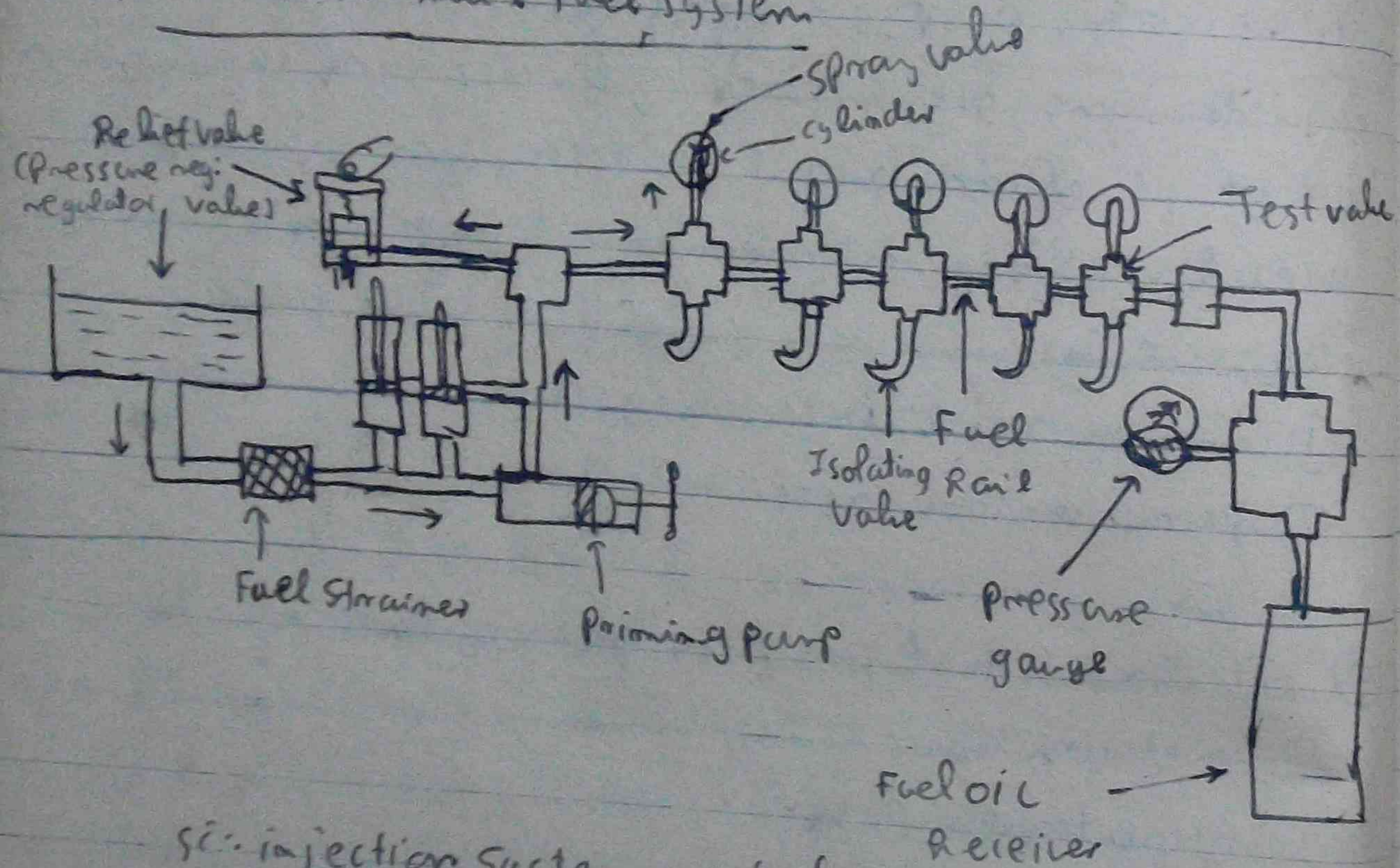
Diesel engine up: on car 333, 340, 350, fuel injection
 • Fuel injection system up: 333, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000, 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100, 1110, 1120, 1130, 1140, 1150, 1160, 1170, 1180, 1190, 1200, 1210, 1220, 1230, 1240, 1250, 1260, 1270, 1280, 1290, 1300, 1310, 1320, 1330, 1340, 1350, 1360, 1370, 1380, 1390, 1400, 1410, 1420, 1430, 1440, 1450, 1460, 1470, 1480, 1490, 1500, 1510, 1520, 1530, 1540, 1550, 1560, 1570, 1580, 1590, 1600, 1610, 1620, 1630, 1640, 1650, 1660, 1670, 1680, 1690, 1700, 1710, 1720, 1730, 1740, 1750, 1760, 1770, 1780, 1790, 1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000, 2010, 2020, 2030, 2040, 2050, 2060, 2070, 2080, 2090, 2100, 2110, 2120, 2130, 2140, 2150, 2160, 2170, 2180, 2190, 2200, 2210, 2220, 2230, 2240, 2250, 2260, 2270, 2280, 2290, 2300, 2310, 2320, 2330, 2340, 2350, 2360, 2370, 2380, 2390, 2400, 2410, 2420, 2430, 2440, 2450, 2460, 2470, 2480, 2490, 2500, 2510, 2520, 2530, 2540, 2550, 2560, 2570, 2580, 2590, 2600, 2610, 2620, 2630, 2640, 2650, 2660, 2670, 2680, 2690, 2700, 2710, 2720, 2730, 2740, 2750, 2760, 2770, 2780, 2790, 2800, 2810, 2820, 2830, 2840, 2850, 2860, 2870, 2880, 2890, 2900, 2910, 2920, 2930, 2940, 2950, 2960, 2970, 2980, 2990, 3000, 3010, 3020, 3030, 3040, 3050, 3060, 3070, 3080, 3090, 3100, 3110, 3120, 3130, 3140, 3150, 3160, 3170, 3180, 3190, 3200, 3210, 3220, 3230, 3240, 3250, 3260, 3270, 3280, 3290, 3300, 3310, 3320, 3330, 3340, 3350, 3360, 3370, 3380, 3390, 3400, 3410, 3420, 3430, 3440, 3450, 3460, 3470, 3480, 3490, 3500, 3510, 3520, 3530, 3540, 3550, 3560, 3570, 3580, 3590, 3600, 3610, 3620, 3630, 3640, 3650, 3660, 3670, 3680, 3690, 3700, 3710, 3720, 3730, 3740, 3750, 3760, 3770, 3780, 3790, 3800, 3810, 3820, 3830, 3840, 3850, 3860, 3870, 3880, 3890, 3900, 3910, 3920, 3930, 3940, 3950, 3960, 3970, 3980, 3990, 4000, 4010, 4020, 4030, 4040, 4050, 4060, 4070, 4080, 4090, 4100, 4110, 4120, 4130, 4140, 4150, 4160, 4170, 4180, 4190, 4200, 4210, 4220, 4230, 4240, 4250, 4260, 4270, 4280, 4290, 4300, 4310, 4320, 4330, 4340, 4350, 4360, 4370, 4380, 4390, 4400, 4410, 4420, 4430, 4440, 4450, 4460, 4470, 4480, 4490, 4500, 4510, 4520, 4530, 4540, 4550, 4560, 4570, 4580, 4590, 4600, 4610, 4620, 4630, 4640, 4650, 4660, 4670, 4680, 4690, 4700, 4710, 4720, 4730, 4740, 4750, 4760, 4770, 4780, 4790, 4800, 4810, 4820, 4830, 4840, 4850, 4860, 4870, 4880, 4890, 4900, 4910, 4920, 4930, 4940, 4950, 4960, 4970, 4980, 4990, 5000, 5010, 5020, 5030, 5040, 5050, 5060, 5070, 5080, 5090, 5100, 5110, 5120, 5130, 5140, 5150, 5160, 5170, 5180, 5190, 5200, 5210, 5220, 5230, 5240, 5250, 5260, 5270, 5280, 5290, 5300, 5310, 5320, 5330, 5340, 5350, 5360, 5370, 5380, 5390, 5400, 5410, 5420, 5430, 5440, 5450, 5460, 5470, 5480, 5490, 5500, 5510, 5520, 5530, 5540, 5550, 5560, 5570, 5580, 5590, 5600, 5610, 5620, 5630, 5640, 5650, 5660, 5670, 5680, 5690, 5700, 5710, 5720, 5730, 5740, 5750, 5760, 5770, 5780, 5790, 5800, 5810, 5820, 5830, 5840, 5850, 5860, 5870, 5880, 5890, 5900, 5910, 5920, 5930, 5940, 5950, 5960, 5970, 5980, 5990, 6000, 6010, 6020, 6030, 6040, 6050, 6060, 6070, 6080, 6090, 6100, 6110, 6120, 6130, 6140, 6150, 6160, 6170, 6180, 6190, 6200, 6210, 6220, 6230, 6240, 6250, 6260, 6270, 6280, 6290, 6300, 6310, 6320, 6330, 6340, 6350, 6360, 6370, 6380, 6390, 6400, 6410, 6420, 6430, 6440, 6450, 6460, 6470, 6480, 6490, 6500, 6510, 6520, 6530, 6540, 6550, 6560, 6570, 6580, 6590, 6600, 6610, 6620, 6630, 6640, 6650, 6660, 6670, 6680, 6690, 6700, 6710, 6720, 6730, 6740, 6750, 6760, 6770, 6780, 6790, 6800, 6810, 6820, 6830, 6840, 6850, 6860, 6870, 6880, 6890, 6900, 6910, 6920, 6930, 6940, 6950, 6960, 6970, 6980, 6990, 7000, 7010, 7020, 7030, 7040, 7050, 7060, 7070, 7080, 7090, 7100, 7110, 7120, 7130, 7140, 7150, 7160, 7170, 7180, 7190, 7200,

- ① common rail injection system
 - ② pump control injection system
- ② (a) Individual pump for each cylinder with metering by
- ① control by p_d pass
 - ② controlled suction
 - ③ variable suction orifice
 - ④ variable stroke
 - ⑤ Port and Helix metering
- (b) one High pressure pump with distribution control delivery to cylinder in fixing order sequence

② Low pressure metering pump & distribution with mechanically operated high pressure pump & nozzle at each cylinder.

Mechanical injection

① common Rail fuel ^{injection} system



Receiver
 5000 psi @ 2 manifold (or) common rail of 6000 psi
 cylinder by injection valve (spray valve) of 6000 psi
 5000 psi cylinder injection valve (spray valve) of 6000 psi
 of 6000 psi. All
 cylinder of 6000 psi of 6000 psi spray valve of 6000 psi.

[illegible]

(2) Pump Control Injection System

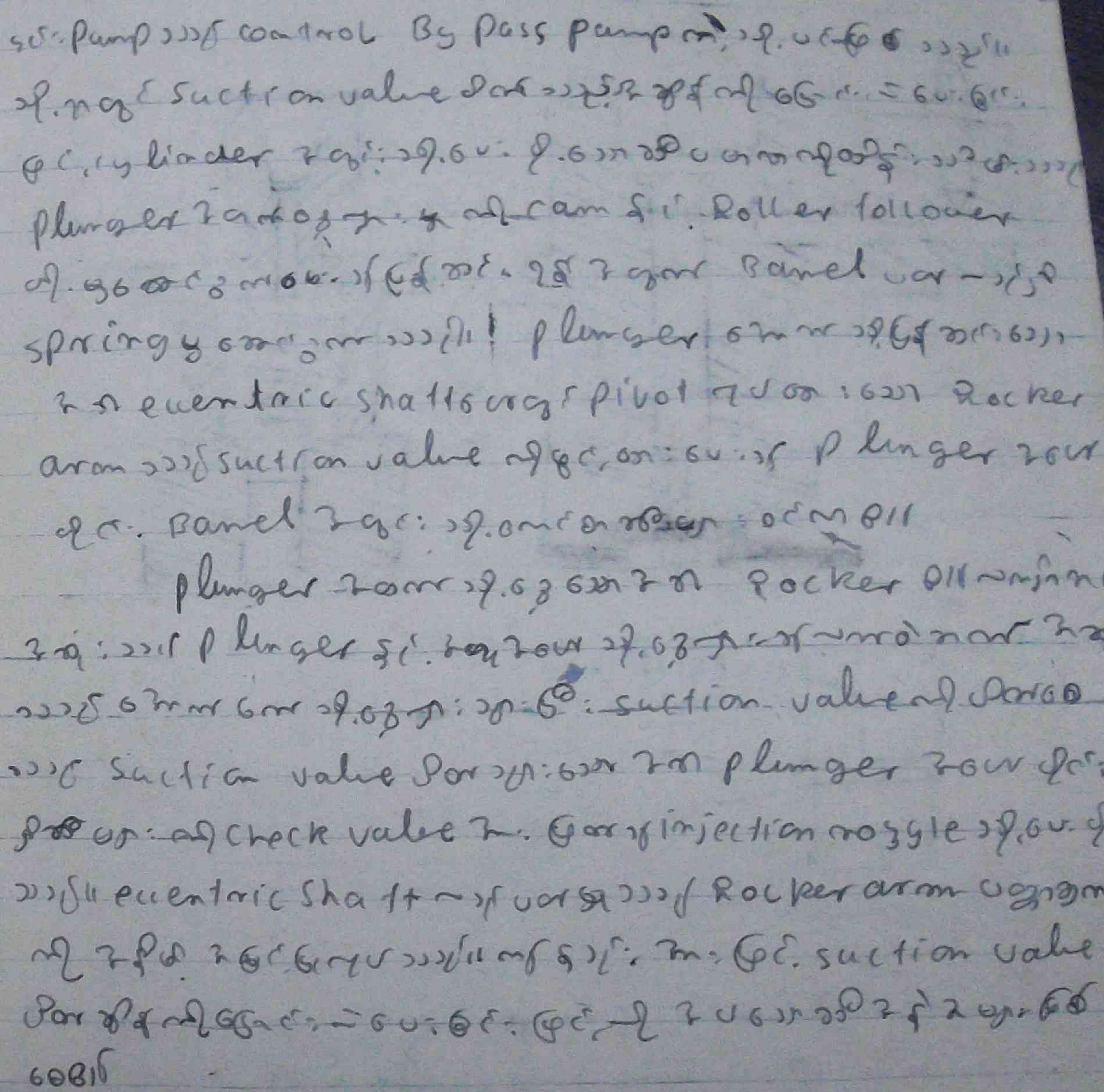
2 (a) Individual plunger pump

1. controlled By pass + injection pump
2. control suction pump
3. variable metering orifice
4. variable stroke pump
5. port and Helix metering pump

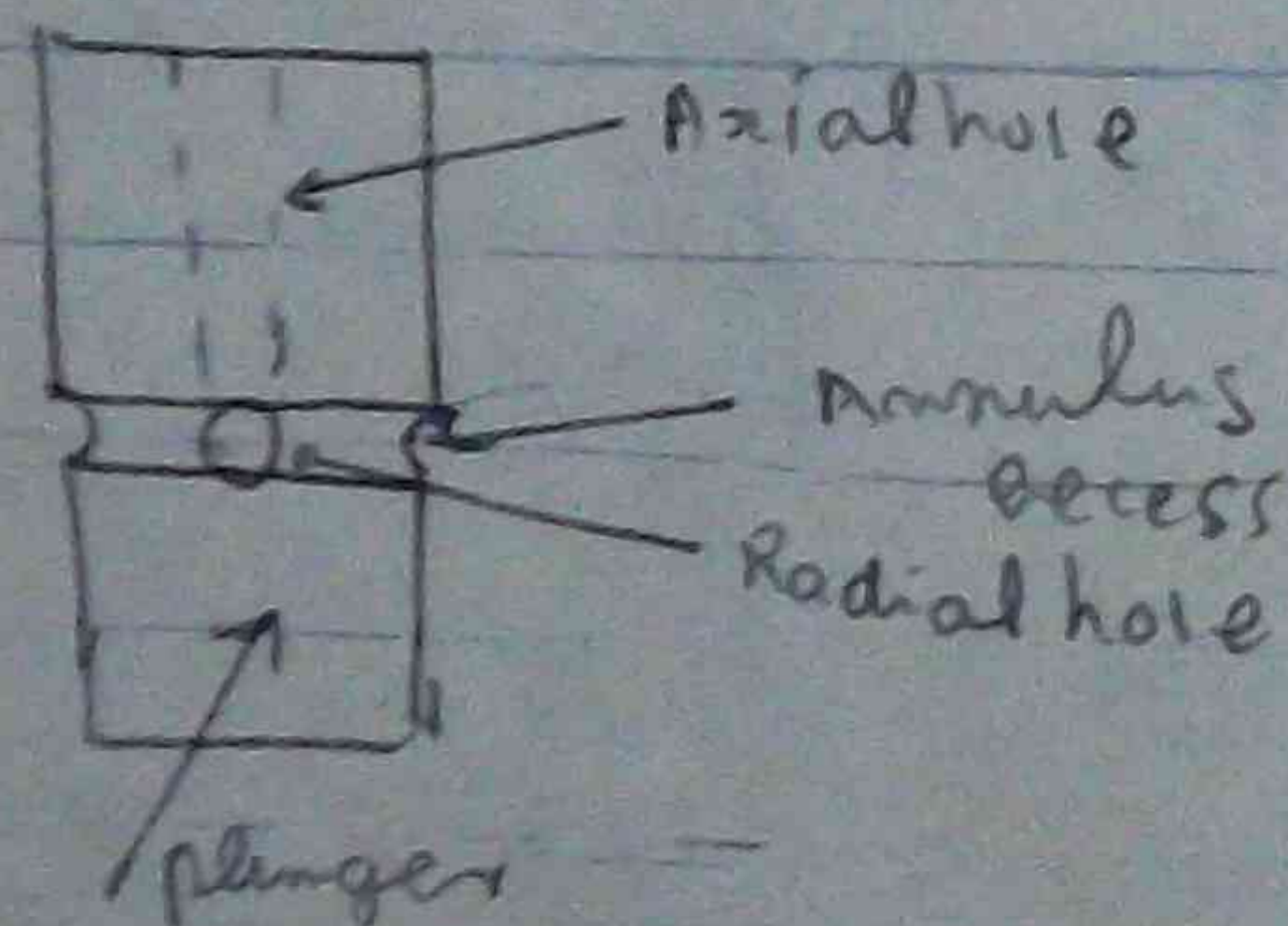
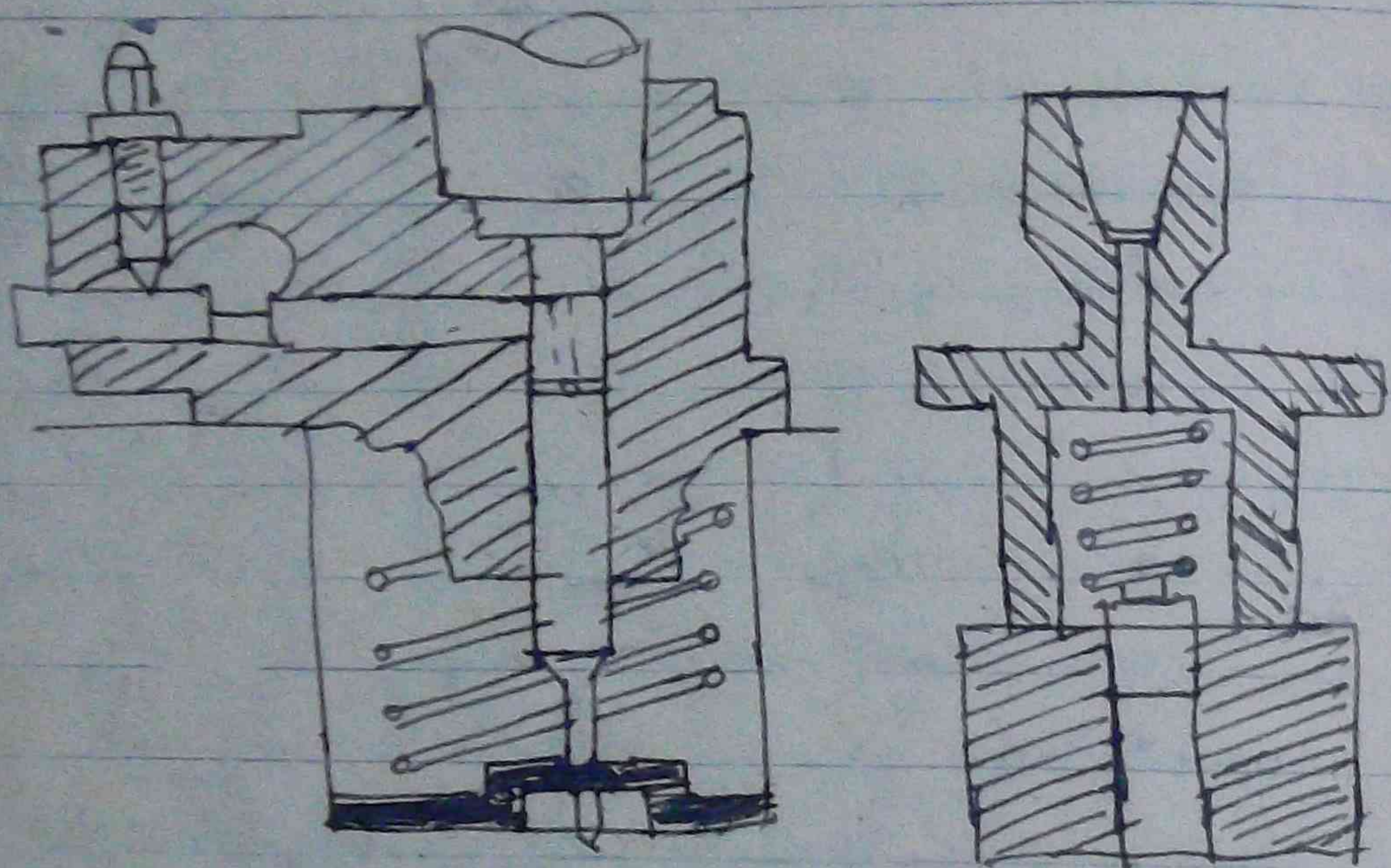
2 (b) Distribution Type pump $\begin{matrix} \text{High} \\ \text{Low} \end{matrix}$

Individual plunger pump

2 a 2 control suction pump



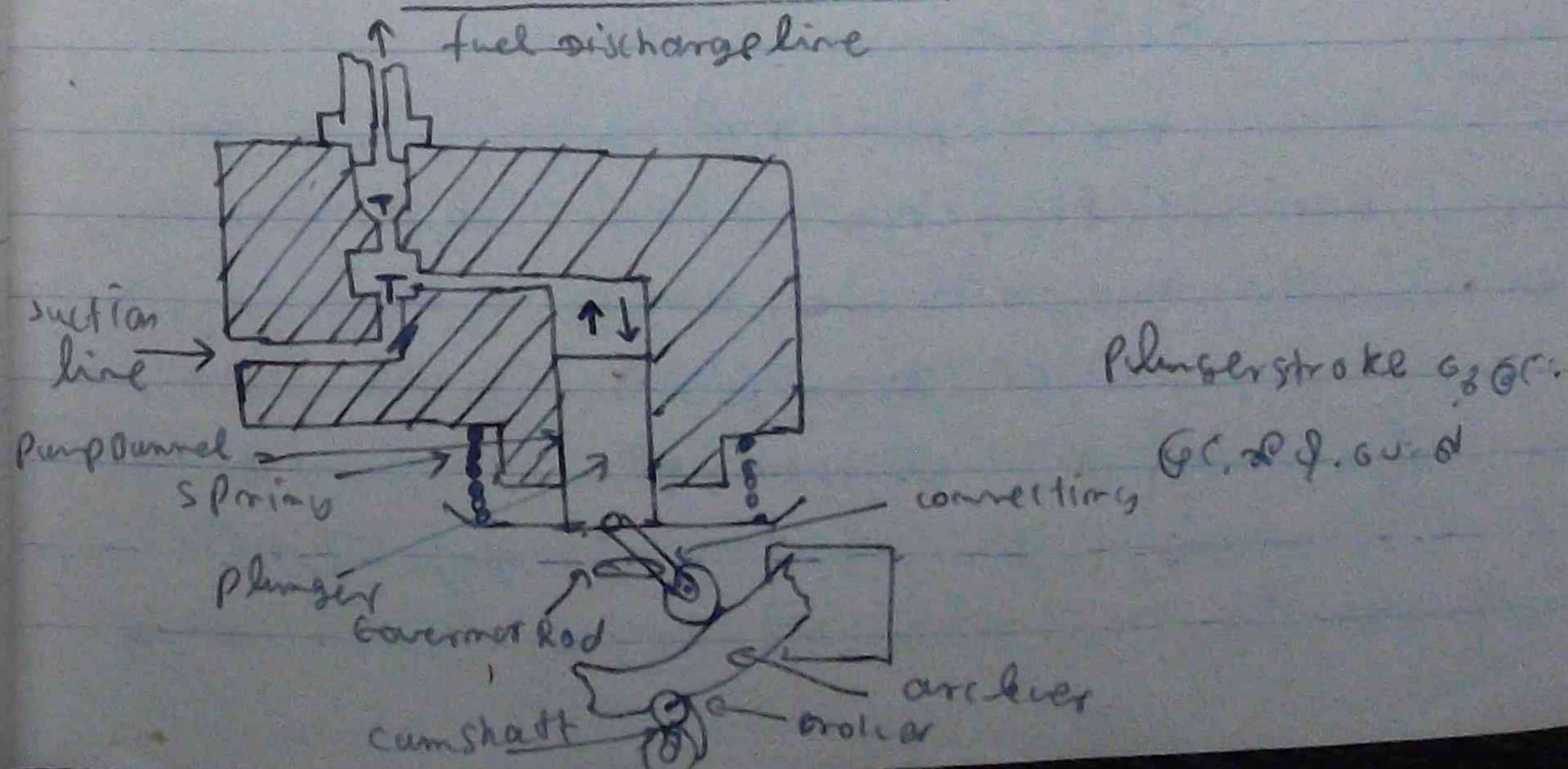
2 a 3 variable metering orifice



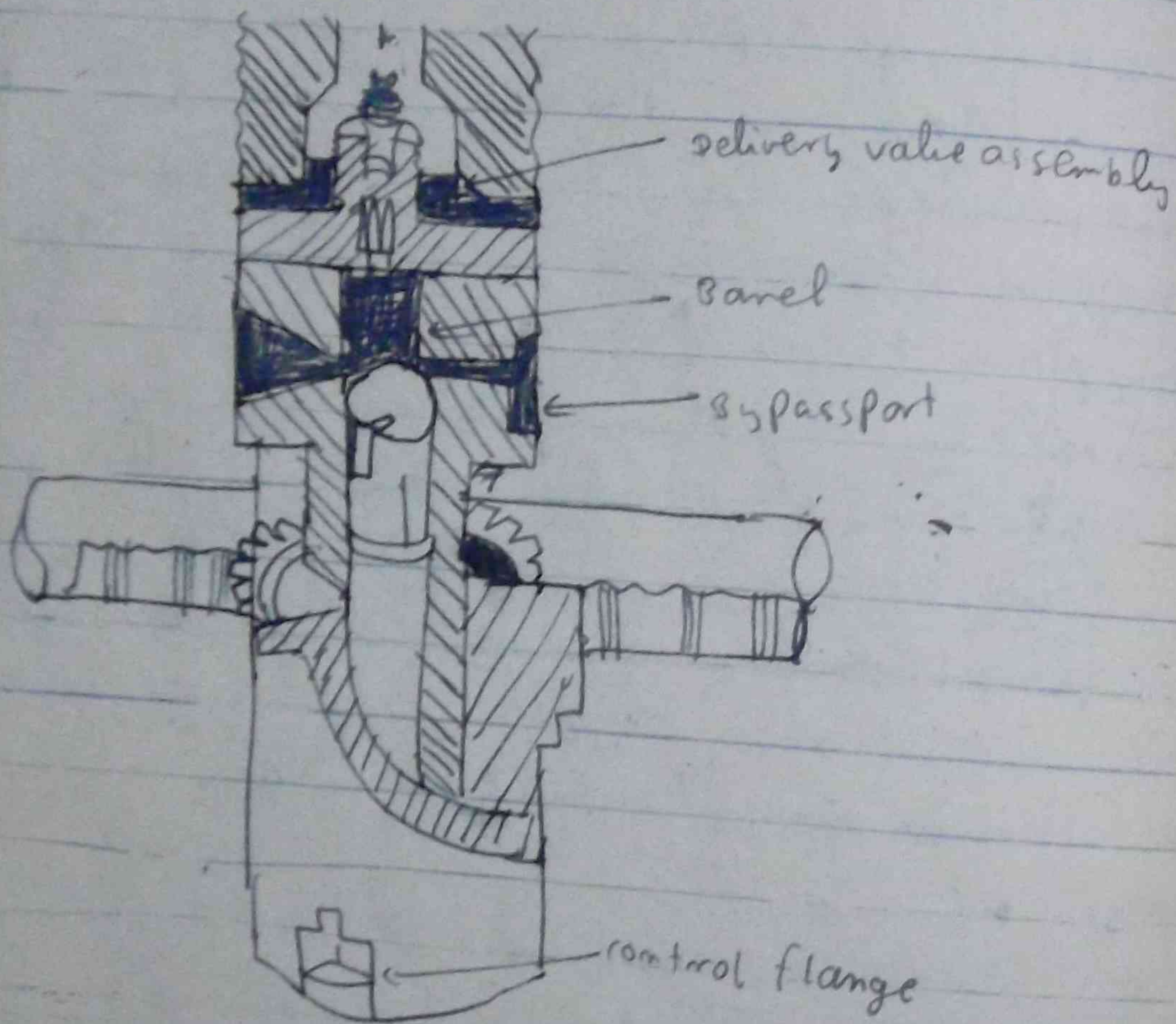
It is used for: 1. Plunger in Engine crank case
2. Engine cam shaft in 6 or 8 cylinder
3. Plunger in 2 or 3 Annulus recess or
4. 2 or 3 or 4 plunger & axial hole & radial hole of 6 or 8 cylinder engine cam shaft
5. Compression in 6 or 8 cylinder plunger & axial hole & radial hole & spring

It is used for: 1. Plunger in 6 or 8 cylinder
2. Suction part of 6 or 8 cylinder plunger & axial hole & radial hole
3. Plunger & axial hole & radial hole of 6 or 8 cylinder
4. Suction part of 6 or 8 cylinder plunger & axial hole & radial hole
5. Check valve of 6 or 8 cylinder plunger & axial hole & radial hole
6. Annulus recess & suction part of 6 or 8 cylinder
7. Plunger & axial hole & radial hole of 6 or 8 cylinder
8. Annulus recess & suction line of 6 or 8 cylinder
9. 6 or 8 cylinder plunger & axial hole & radial hole
10. Pump & axial hole & radial hole of 6 or 8 cylinder
11. Horizontal pin & axial hole & radial hole of 6 or 8 cylinder
12. Suction orifice & axial hole & radial hole of 6 or 8 cylinder
13. 6 or 8 cylinder plunger & axial hole & radial hole

2 a 4 variable stroke pump



2 a 5 part and Helix Metering Pump



Helix metering pump is a type of pump which is used for metering fuel oil. It consists of a plunger and a barrel. The plunger is connected to a vertical slot, Annulus Recess. The barrel has a bypass port. The plunger is connected to a horizontal shaft with gears. The diagram is labeled with 'delivery valve assembly', 'barrel', 'bypass port', and 'control flange'.

Plunger of Helix metering pump is connected to the barrel. The plunger is connected to a vertical slot, Annulus Recess. The barrel has a bypass port. The plunger is connected to a horizontal shaft with gears. The diagram is labeled with 'delivery valve assembly', 'barrel', 'bypass port', and 'control flange'.

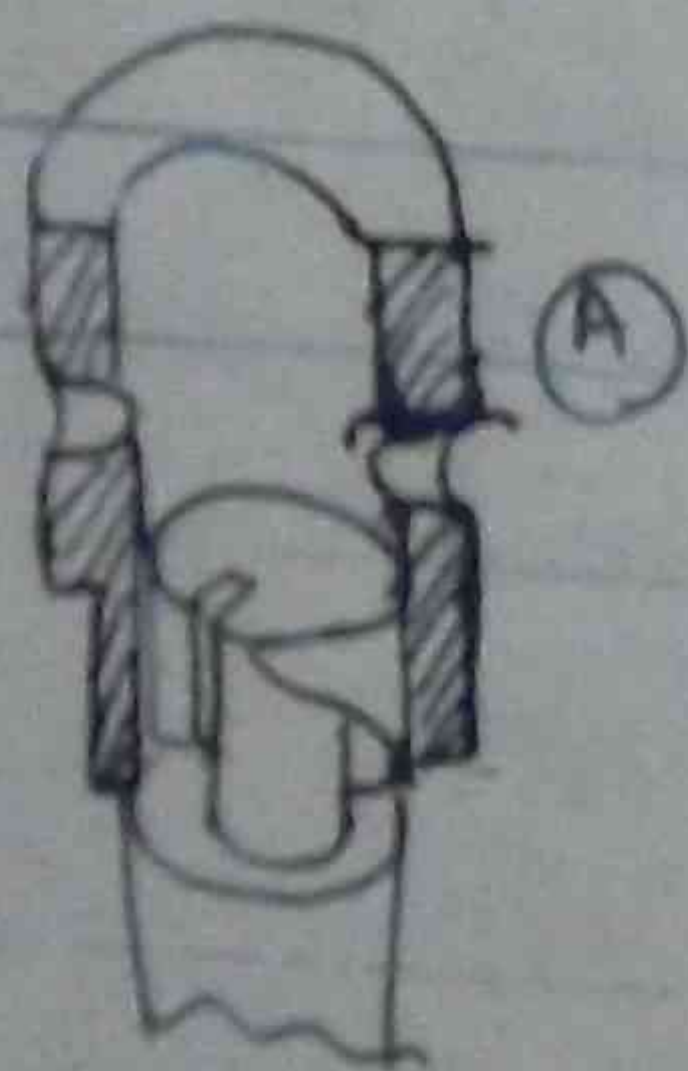
Plunger of Helix metering pump is connected to the barrel. The plunger is connected to a vertical slot, Annulus Recess. The barrel has a bypass port. The plunger is connected to a horizontal shaft with gears. The diagram is labeled with 'delivery valve assembly', 'barrel', 'bypass port', and 'control flange'.

Plunger stroke is the distance between the top and bottom of the plunger. The effective stroke is the distance between the top and bottom of the plunger. The Helix metering pump is a type of pump which is used for metering fuel oil. It consists of a plunger and a barrel. The plunger is connected to a vertical slot, Annulus Recess. The barrel has a bypass port. The plunger is connected to a horizontal shaft with gears. The diagram is labeled with 'delivery valve assembly', 'barrel', 'bypass port', and 'control flange'.

Barrel of Helix metering pump is connected to the plunger. The barrel is connected to a vertical slot, Annulus Recess. The plunger is connected to a horizontal shaft with gears. The diagram is labeled with 'delivery valve assembly', 'barrel', 'bypass port', and 'control flange'.

Helix
constant
regional

Variable end of injection



Ⓐ



13



variable
beginning
constant
end of object

c b d

end of Injection
maximum
fuel position

start of injection



by Descartes



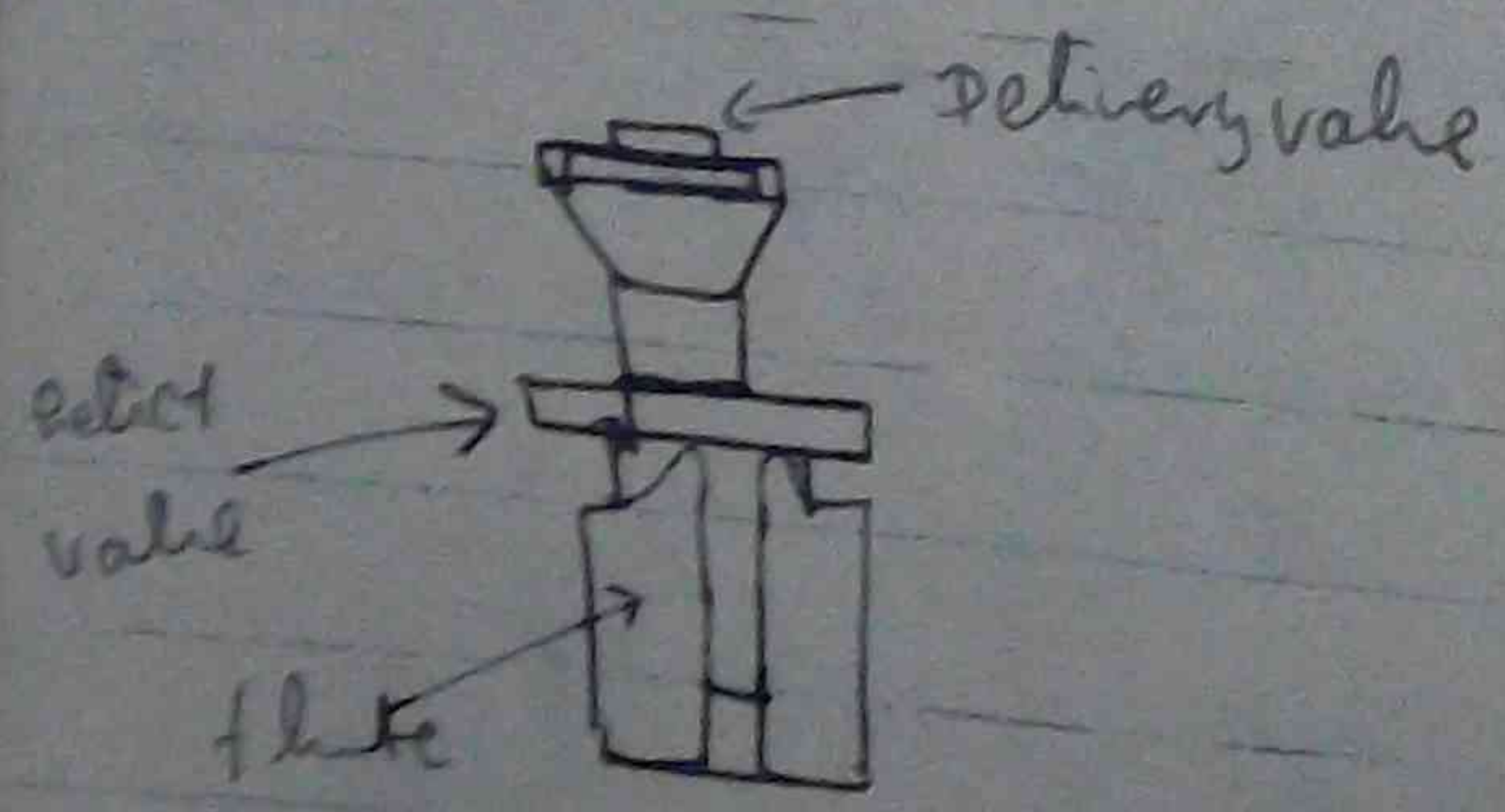
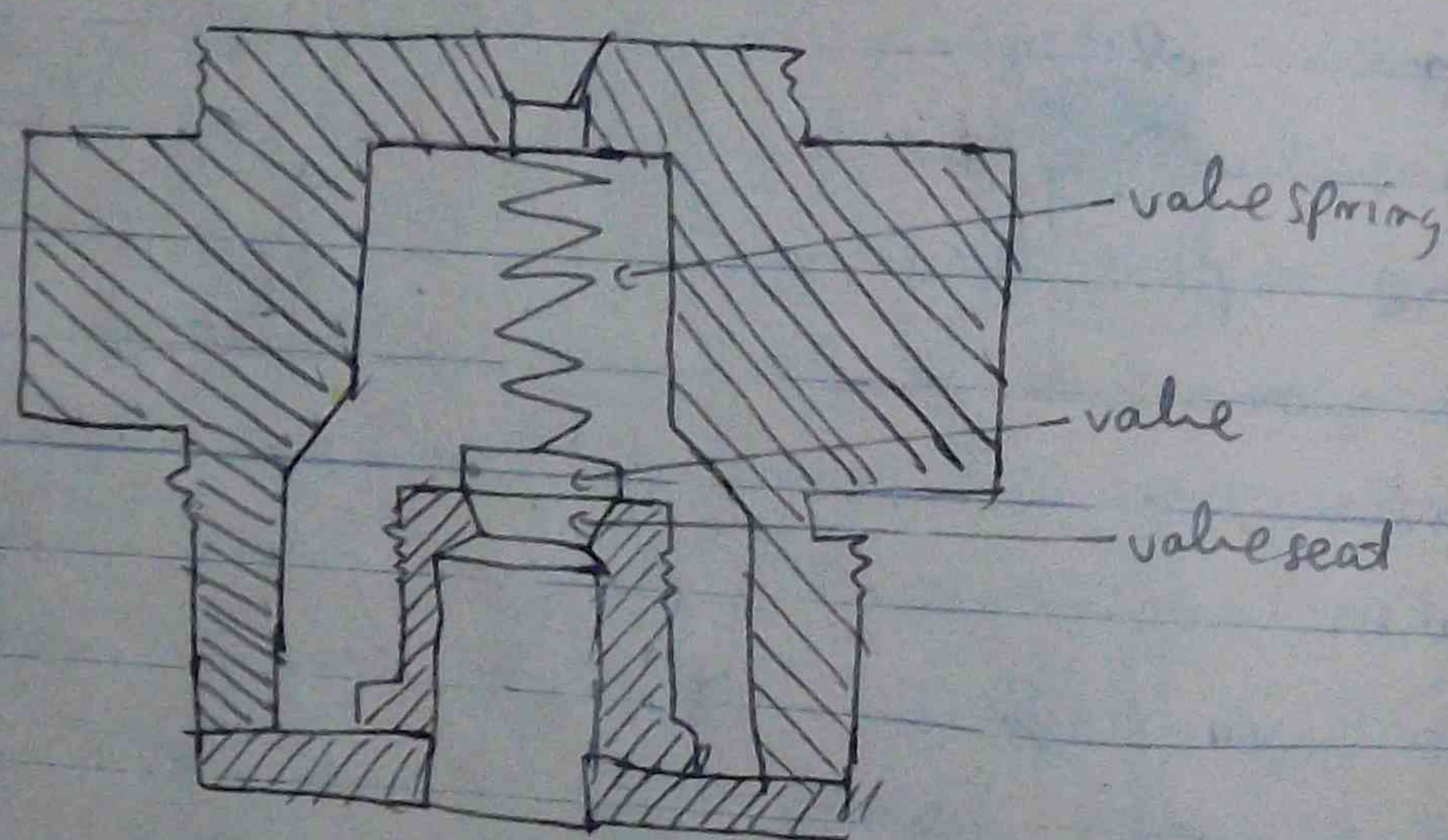
in factum
2nd slow



No fuel
position

[illegible]

of 60-80 psi, valve gear, nozzle and jet of 60-80 psi
 pressure of 60-80 psi, jet of 60-80 psi
 delivery valve of 60-80 psi, nozzle of 60-80 psi
 combustion chamber 20-30 psi, jet of 60-80 psi
 60-80 psi of motor oil



2b - Distribution Type Fuel Pump 1st: 1st 2nd: 60-80 psi

- ① High Pressure distributor with one high pressure pump
- ② Low pressure distributor with mechanically operated nozzle of 60-80 psi

2b 1 High Pressure distributor with one high pressure pump

Cylinder: 20-30 psi, pump: 60-80 psi
 engine up: 20-30 psi, cylinder: 60-80 psi, power 22 psi
 on 1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th
 High pressure metering pump: distributor
 of 60-80 psi, 60-80 psi, 60-80 psi, 60-80 psi, 60-80 psi, 60-80 psi
 of 4 cyl. engine pump 60-80 psi, 60-80 psi, 60-80 psi
 part 50. Helix 20-30 psi, pump 60-80 psi, 60-80 psi
 20-30 psi, distributor block manifold 60-80 psi
 of 60-80 psi, 60-80 psi, 60-80 psi, distributor valve of 60-80 psi
 60-80 psi, 60-80 psi, 60-80 psi, 60-80 psi, 60-80 psi, 60-80 psi

(A) American Bosch Division [or] American Bosch America Corporation

engine cylinder or 2 stroke pump element or
 2 stroke or 4 stroke. In 2 stroke engine, the
 cylinder is common to both suction and
 delivery.

2 stroke pump has a plunger on the
 cylinder. The plunger has an inlet and a
 delivery port.

The inlet port is at the bottom of the
 cylinder and the delivery port is at the top.

The plunger is driven by the crankshaft.

The delivery valve is at the top of the
 cylinder and the inlet valve is at the bottom.

Principle

The plunger moves up and down in the
 cylinder. When it moves up, it compresses the
 fuel. When it moves down, it draws in the
 fuel. The delivery valve opens when the
 plunger moves up and the inlet valve opens
 when the plunger moves down.

Control

Engine oil speed & load of 2 stroke cylinder is
 stroke and 4 stroke. In 2 stroke engine, the
 cylinder is common to both suction and
 delivery. The plunger is driven by the crankshaft.
 The delivery valve is at the top of the cylinder
 and the inlet valve is at the bottom.

Simms pump

The pump housing is of 16 mm. The cam shaft
 is of 16 mm. The pump is made of light alloy.
 The plunger is of steel. The delivery valve is
 at the top of the cylinder and the inlet valve
 is at the bottom. The plunger is driven by the
 crankshaft.



The pump is driven by the crankshaft. The
 plunger is driven by the crankshaft. The
 delivery valve is at the top of the cylinder
 and the inlet valve is at the bottom. The
 plunger is driven by the crankshaft.

The plunger is driven by the crankshaft. The
 delivery valve is at the top of the cylinder
 and the inlet valve is at the bottom. The
 plunger is driven by the crankshaft.

no pressure gain due to delivery valve
seal. High pressure discharge tubing (nozzle
pipe) effect. nozzle eff. or not eff. of spray head
due to roof: 01

(7) Plunger & fuel Aerial Hole arrangement of plunger & fuel. Horizontal groove of SC of Radial hole of SC or plunger & SC or Helix of SC pass part of SC or plunger & SC. SC of SC, Aerial hole, radial hole vertical groove of SC. SC pass part of fuel Receiver of SC. SC of SC. Pressure of SC. Injection of SC. Oil

4) Plunger and water meter and T & C
 and spring in. of the water meter.
 of port up: of the of the cycle of the water meter.
 and the of the of the

* cylinder bore: 80 mm; stroke: 95 mm
 piston effective stroke 67 mm
 piston effective stroke = piston bore
 inlet port at 180° by pass port at 360°
 s.c. helix 180° & 360°

Plunger of Borehole Drilling, 60: 60: 60, 30 Pass
 Port of 60: 60: 60, 30 Pass
 effective stroke of 60: 60: 60, 30 Pass

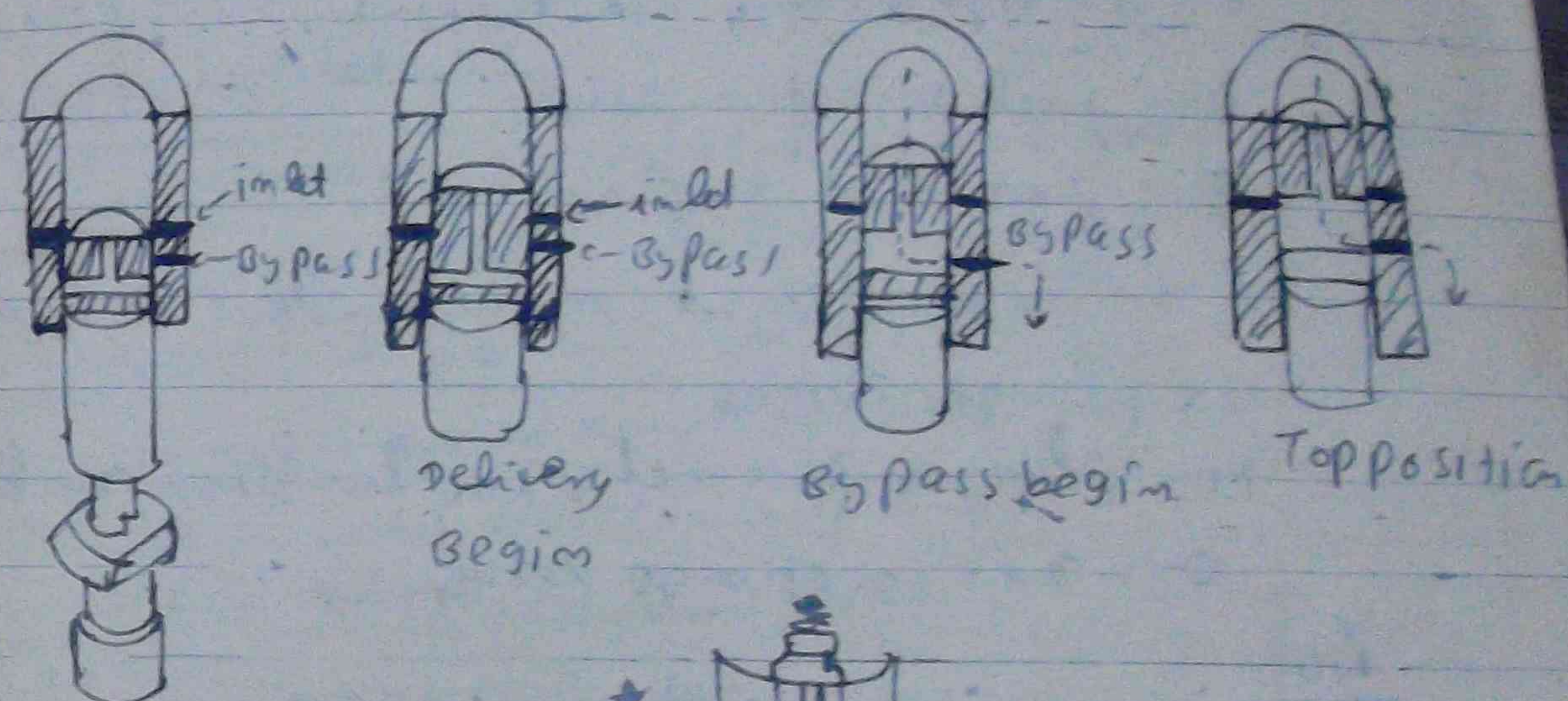
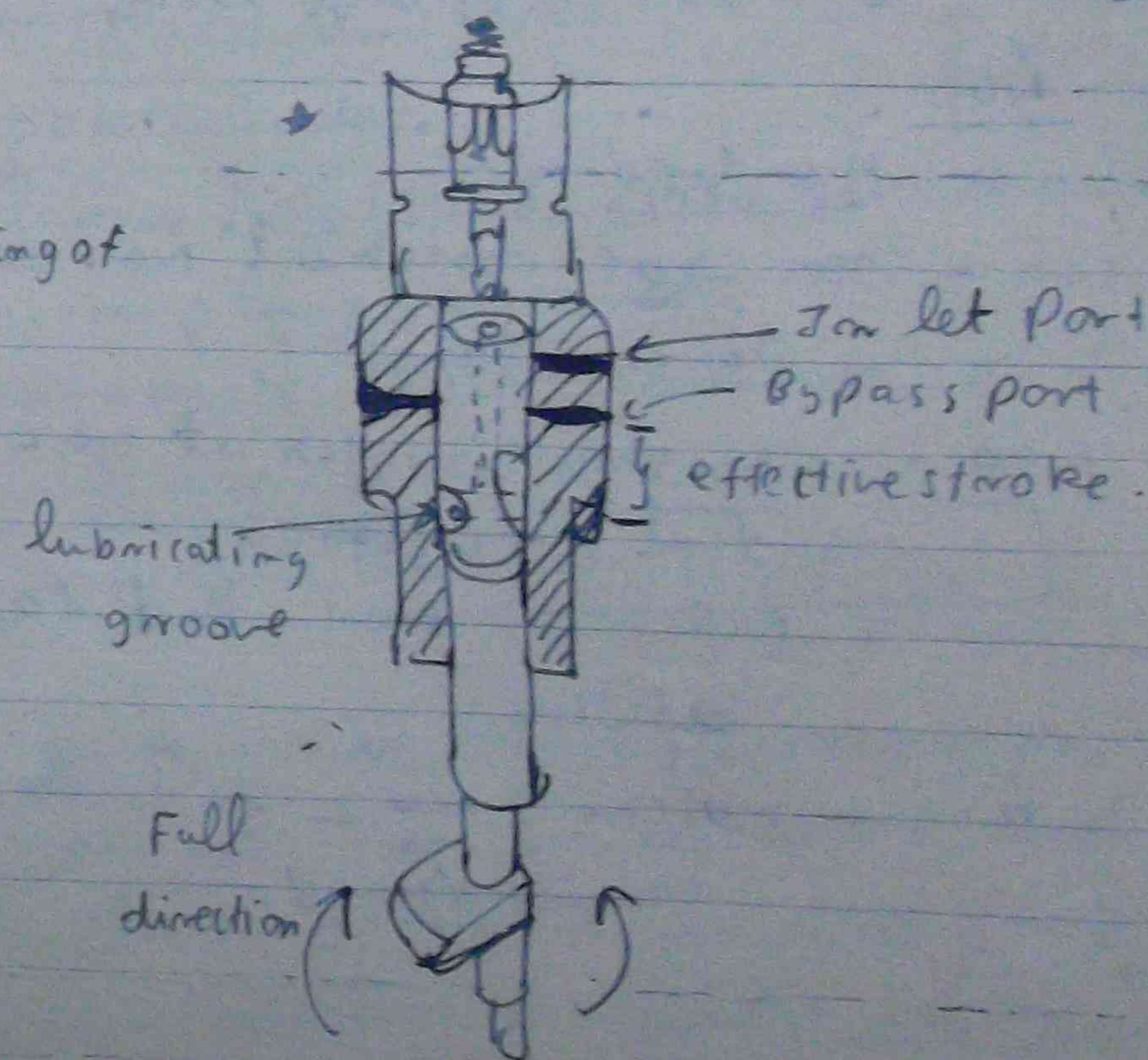


Fig (1) Forest
Position falling of



Pump symbols

| | | | | | | | | | |
|---|---|---|---|---|----|---|-----|---|------|
| B | P | E | 6 | 3 | 70 | Q | 320 | 3 | 5147 |
|---|---|---|---|---|----|---|-----|---|------|

B = British made (N = Nippon)

P = fuel injection pump

E = enclosed cam shaft

no = plunger element (or 2 cylinder) (2 or 2 1/2)

3 = plunger stroke

70 = plunger diameter in length of mm

Q = design change letter

NOS

Hundred

100 = cam shaft notch at No 1 end no feed pump flange

200 = cam shaft notch at No 2 end no fuel pump flange

300 = Notch at No 1 end feed pump can be fitted

400 = notch at No 2 end feed pump can be fitted

Govs

0 = without Governor

1 = Governor at No 1 end

2 = Governor at No 2 end

units

0 = without advance device

1 = advance device at No 1 end

2 = advance device at No 2 end

After Assembly

Number Indicate that a Bankeing plate is fitted over fuel fuel pump flange

SP E 6 B 80, C 5147

S = Simms manufactures

P = fuel injection pump

E = enclosed cam shaft

6 = 600 cylinder

8 = plunger type (Standard 450mm centre length)

80 = 80mm plunger diameter

5147 = maker's specification no and design features

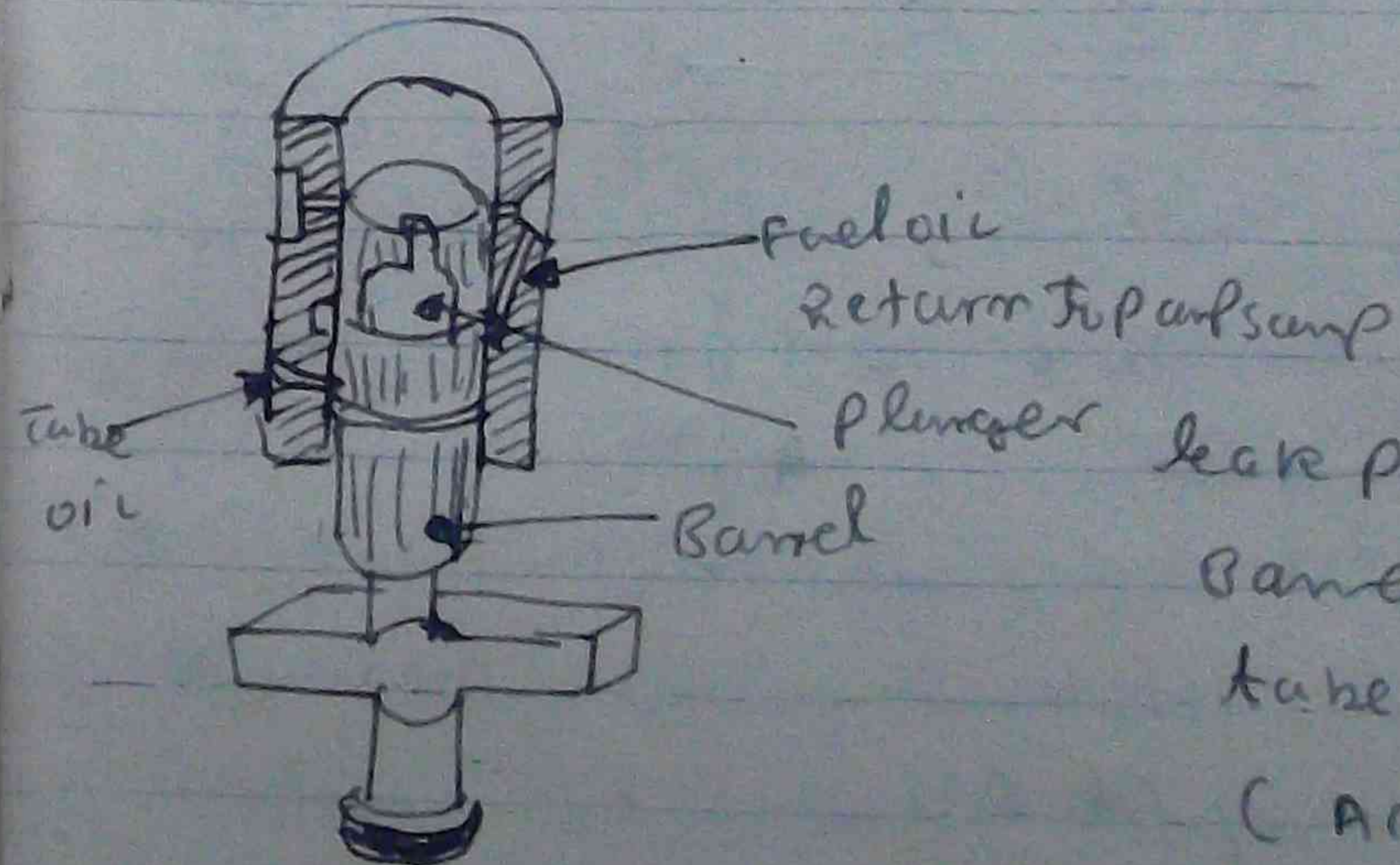
Caterpillar fuel injection pump

sliding gear over fuel injection pump; 2 or 3
Flange mounting 2 or 3; 2 or 3; self contained
drive (multi plunger) 2 or 3; 2 or 3; 2 or 3; 2 or 3
600mm 2 or 3; 2 or 3; 2 or 3; 2 or 3
mounting pump; 2 or 3; 2 or 3; 2 or 3; 2 or 3

[illegible]

Injection Pump & its Housing, Plunger
Barrel, Discharge Valve & Valve Body, and
oil mechanical Governor and drive housing & its
components: If Governor shaft and cam shaft
are not geared, then it is called as gearless engine or

Leak Proof Plunger and Barrel



Leaf Proot Plunger and
Panel Assembly with
tubercle seat Ring -
(American Bosch)

[illegible]

distribution pump for delivery valve & gear type
 supply pump & variable speed governor
 245 mm of 245 mm of 245 mm of 245 mm
 0.11 m/s

- [illegible]

Hydraulic head Tr. Housing of Bolt & Nut
valve. Or II 5' or Head block, control sleeve
plunger, delivery valve assembly, plunger
drive gear &c. Plunger return spring of, or
or II return spring of 64 mm of 64 mm of 64 mm of
spring set &c. Retainer of 64 mm of 64 mm of plunger

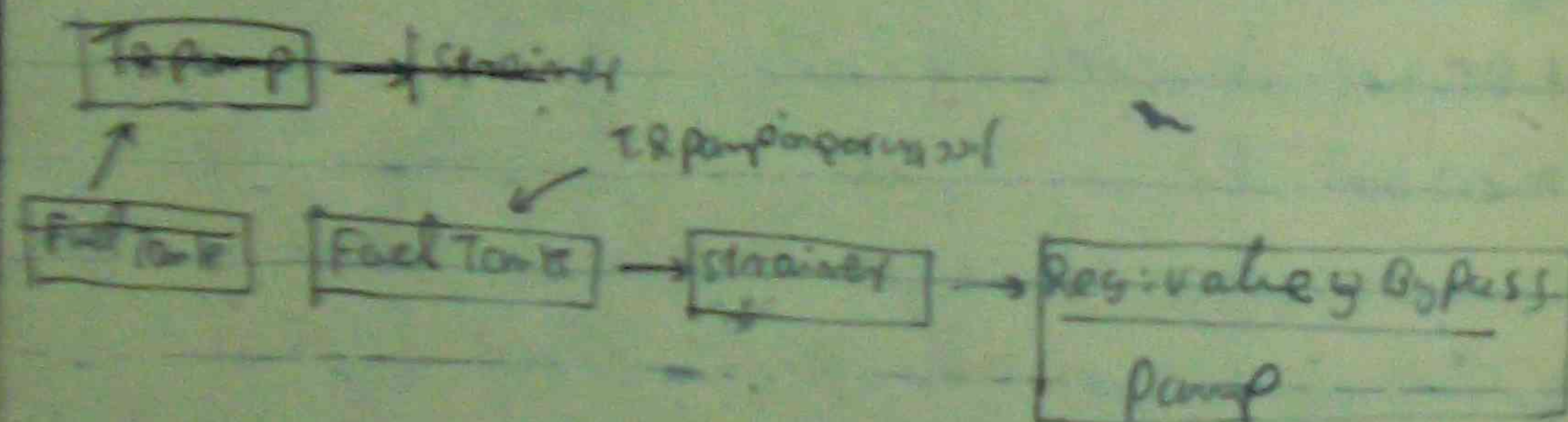
Plunger B 11 6 mm of edge of Annulus on a or 500 cm. of
Plunger B 11 2 mm of 3 600 vertical hole of 9 cm. second

mechanical centrifugal Type Governor mechanism
shaft or cam of gear mechanism with spider and
weight Assembly control spring sliding sleeve
tubular ~~lever~~ ^{lever} stop plate of operating shaft of work
with cam shaft at speed governor weight of
centrifugal force of governor weight of
weight of governor (fig finger)
of thrust bearing gear sliding sleeve
of governor spring in work of governor
control sleeve of governor of governor
pivot pin of tubular lever
of governor hydraulic head of governor control
sleeve in governor of governor of governor

28 pump (20)

Refinery Bore & up: - Driveshaft, governor, weight
distributor, Rotor, plunger
fuel Transfer pump

plunger and rotor 7000; 8000 and 9000 on cam rings
of rollers 7000 and 8000 on cam rings of engine
6000 roller 7000 7000 of cam roller 7000



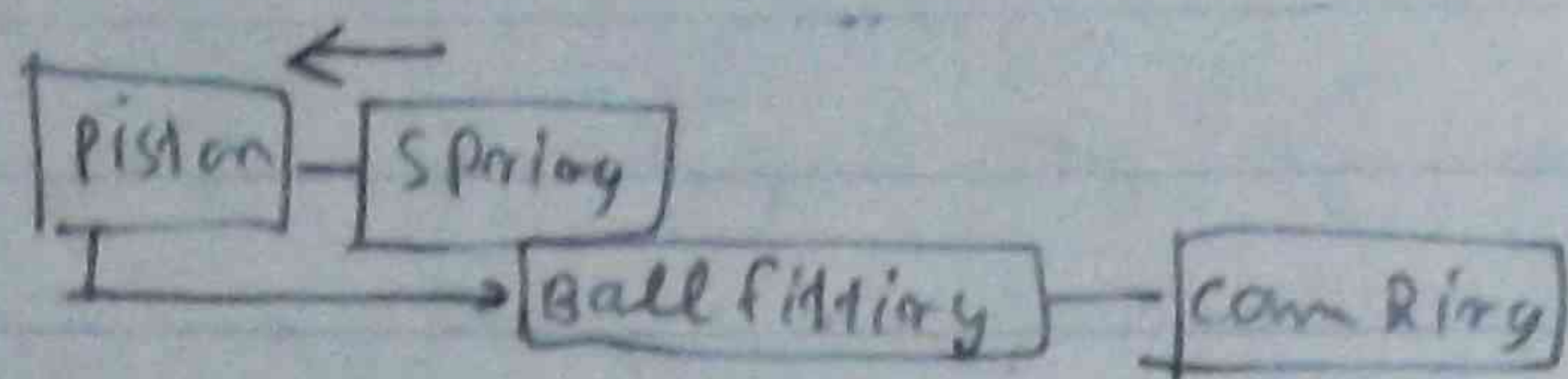
① The transfer pump of fuel tank is designed 0.00 (standard)
inflow pump of 0.00 or pump up: 0.000000 and up:
2.000000 and up: 0.000000 Regulation valve of 0.00
below of bypass of 0.000000 Transfer pump of 0.00 m:
and engine of speed 0.000000 of 0.000000
regulation valve of design 0.000000 Transfer
pump of 0.000000 of 0.000000, of hydraulic head
of supply, Appulus of 0.000000 0.000000 metering
valve of 0.000000 passage of 0.000000 valve of 0.000000

[illegible]

rotor and drive shaft of 70% of normal weight.
 1. charging hole and charging to normal, or, can
 2. 1. 2. 3. 4. 5. 6. 7. 8. 9. 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. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833

Relief of High pressure line

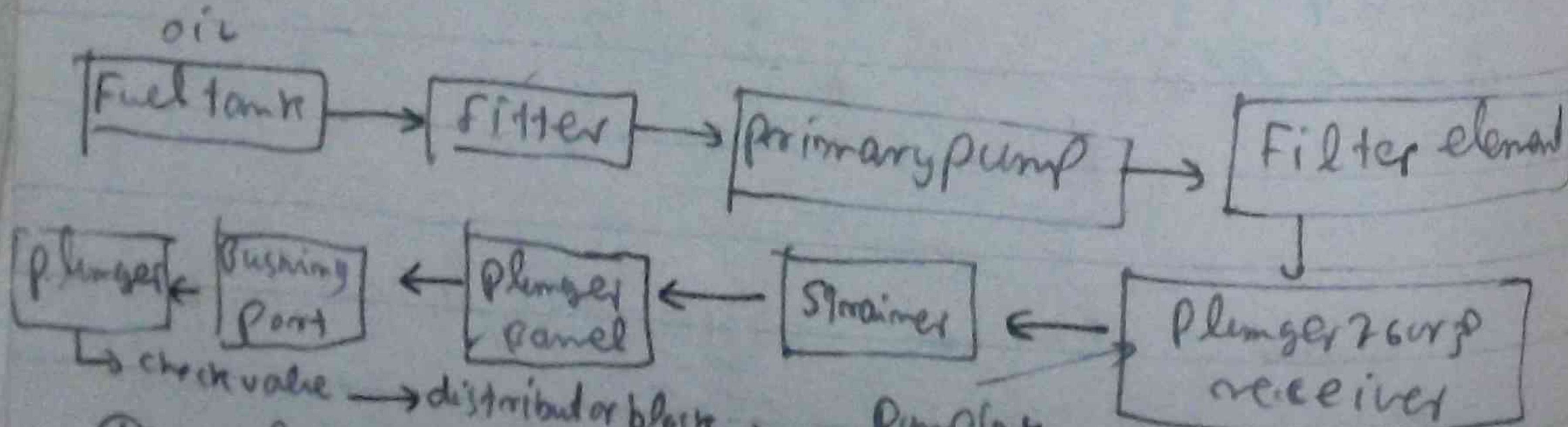
Timing Device



Engine speed of 1200 rpm feed pump @ 2000 rpm @ 5000 rpm
 by piston of 2000 rpm spring of 2000 rpm of piston @ 5000 rpm
 ball fitting @ 5000 rpm cam ring of 2000 rpm @ 5000 rpm
 rotor of 2000 rpm @ 5000 rpm injection timing @ 5000 rpm
 speed in space @ 2000 rpm @ 5000 rpm spring of 2000 rpm @ 5000 rpm
 piston of 2000 rpm @ 5000 rpm to normal timing @ 5000 rpm

International Harvester Pump

① Pump unit 12 (12) 12000

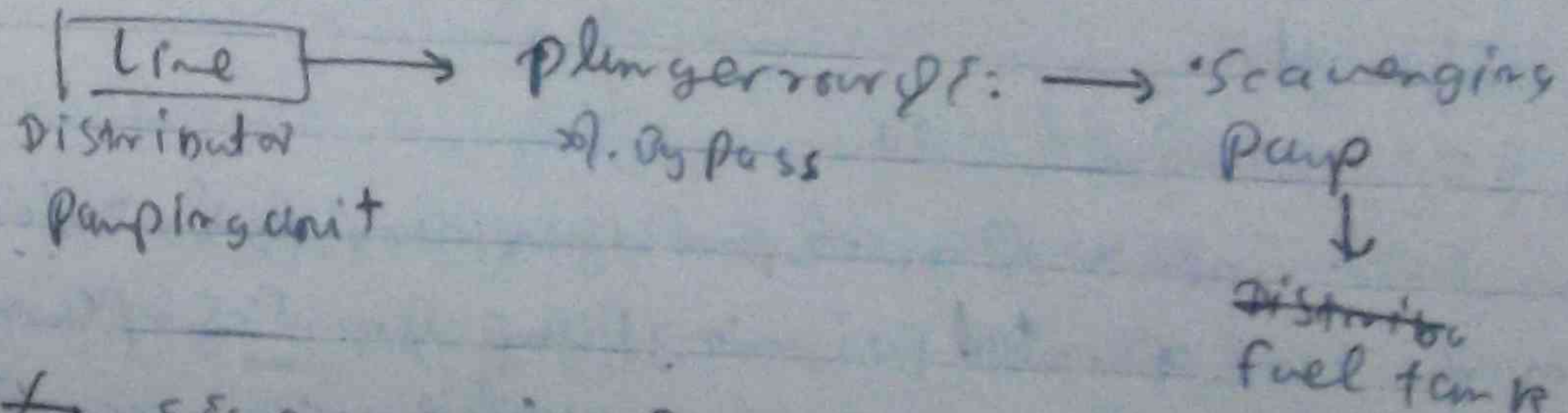


② - relief valve - Pumping unit @ 2000 rpm @ 5000 rpm
 pressure 2000 rpm @ 5000 rpm
 - pressure from relief valve @ 2000 rpm @ 5000 rpm suction side

(2000 rpm) 2000 rpm @ 5000 rpm

- Injection @ 2000 rpm check valve 2000 rpm @ 5000 rpm
 6000 rpm receiver check valve @ 6000 rpm line @ 6000 rpm
 2000 rpm plunger row @ 2000 rpm chamber @ 2000 rpm pass
 6000 rpm line pressure @ 6000 rpm nozzle @ 6000 rpm dropping
 (2000 rpm @ 6000 rpm) @ 6000 rpm
 - pressure from 2000 rpm @ 6000 rpm
 - Pumping stroke @ 2000 rpm valve @ 6000 rpm oil
 plunger 1100 rpm @ 6000 rpm @ 6000 rpm @ 6000 rpm pass
 parting @ 6000 rpm plunger @ 6000 rpm @ 6000 rpm @ 6000 rpm
 pressure @ 6000 rpm of fuel receiver 2000 rpm @ 6000 rpm
 2000 rpm @ 6000 rpm of 2000 rpm fuel return check valve
 2000 rpm @ 6000 rpm fuel supply pressure @ 6000 rpm @ 6000 rpm

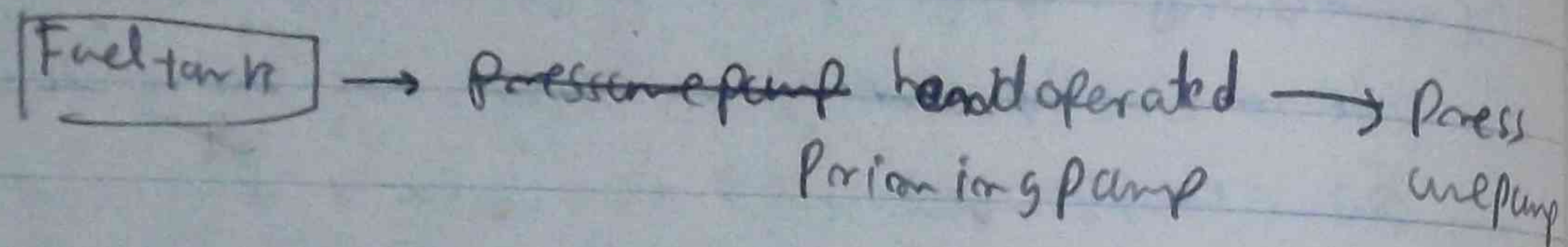
Imi @ 6000 rpm



- Scavenging pump housing @ 6000 rpm @ 6000 rpm
 - Air filter @ 6000 rpm engine air filter @ 6000 rpm
 - Auxiliary filter @ 6000 rpm of pump house @ 6000 rpm
 6000 rpm ventilation 2000 rpm

— 52 Pump —

- ① Pressure and suction part
- ② float chamber
- ③ metering unit
- ④ distributor
- ⑤ governor



S.2 pump [D.D]

[illegible]

- ① Pressure & suction pump
- ② Float chamber
- ③ metering unit
- ④ distributor
- ⑤ Governor of pop valve

Fuel Types & General pressure pump & L.G. & G.O.:

1. Hand operated priming pump of ~ 25-50 cm³ per stroke.
2. Centrifugal priming valve 80% vacuum for fuel of 100 cm³ per stroke of 100 cm³ engine and 10% vacuum priming value of 80% vacuum for 200 cm³ oil.

[illegible][illegible]

1. Air supply valve: Air supply valve is the valve which allows air to enter the cylinder during the intake stroke. It is located at the front of the cylinder head.

2. Metering pump: The metering pump is a pump which draws fuel from the fuel tank and pumps it into the injection system. It is located at the front of the engine.

3. Suction stroke: The suction stroke is the stroke during which the piston moves downwards and draws air into the cylinder.

4. Distribution disc: The distribution disc is a disc which is mounted on the camshaft and which controls the opening and closing of the valves.

5. Injection pump: The injection pump is a pump which pumps fuel into the injectors. It is located at the front of the engine.

6. Governor: The governor is a device which controls the speed of the engine. It is located at the front of the engine.

7. Throttle valve: The throttle valve is a valve which controls the amount of air entering the engine. It is located at the front of the engine.

8. Tapered needle: The tapered needle is a needle which is used in the injectors. It is located at the front of the engine.

9. Mechanical governor: The mechanical governor is a governor which controls the speed of the engine. It is located at the front of the engine.

10. Hydraulic governor: The hydraulic governor is a governor which controls the speed of the engine. It is located at the front of the engine.

- ① standard model
 - ② Tractor type
- Distribution of fuel: The fuel is distributed to the injectors by the injection pump. The injectors then spray the fuel into the cylinder.
- Check valve: The check valve is a valve which prevents the fuel from flowing back into the injection pump. It is located at the front of the engine.
- Plunger: The plunger is a piston which is used in the injection pump. It is located at the front of the engine.
- Second check valve: The second check valve is a valve which prevents the fuel from flowing back into the injection pump. It is located at the front of the engine.

cylinder: The cylinder is the chamber in which the combustion takes place. It is located at the front of the engine.

distributor: The distributor is a device which distributes the fuel to the injectors. It is located at the front of the engine.

nozzle: The nozzle is a device which sprays the fuel into the cylinder. It is located at the front of the engine.

plunger: The plunger is a piston which is used in the injection pump. It is located at the front of the engine.

spring: The spring is a device which returns the plunger to its original position. It is located at the front of the engine.

air valve: The air valve is a valve which allows air to enter the cylinder. It is located at the front of the engine.

fuel valve: The fuel valve is a valve which allows fuel to enter the injection system. It is located at the front of the engine.

pressure stroke: The pressure stroke is the stroke during which the piston moves upwards and compresses the fuel.

explosion: The explosion is the combustion of the fuel. It is located at the front of the engine.

pre heat: The pre heat is a device which preheats the fuel. It is located at the front of the engine.

nozzle: The nozzle is a device which sprays the fuel into the cylinder. It is located at the front of the engine.

needle valve: The needle valve is a valve which controls the flow of fuel into the cylinder. It is located at the front of the engine.

cam shaft: The cam shaft is a shaft which controls the opening and closing of the valves. It is located at the front of the engine.

injection: The injection is the process of spraying the fuel into the cylinder. It is located at the front of the engine.

rocker arm: The rocker arm is a device which controls the opening and closing of the valves. It is located at the front of the engine.

timing: The timing is the sequence of events in the engine cycle. It is located at the front of the engine.

fuel: The fuel is the substance which is burned to produce energy. It is located at the front of the engine.

air: The air is the gas which is used in the combustion process. It is located at the front of the engine.

unit: The unit is a device which controls the speed of the engine. It is located at the front of the engine.

unit injection

Fuel injection pump: The fuel injection pump is a pump which pumps fuel into the injectors. It is located at the front of the engine.

nozzle: The nozzle is a device which sprays the fuel into the cylinder. It is located at the front of the engine.

air valve: The air valve is a valve which allows air to enter the cylinder. It is located at the front of the engine.

fuel valve: The fuel valve is a valve which allows fuel to enter the injection system. It is located at the front of the engine.

pressure stroke: The pressure stroke is the stroke during which the piston moves upwards and compresses the fuel.

explosion: The explosion is the combustion of the fuel. It is located at the front of the engine.

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cam shaft: The cam shaft is a shaft which controls the opening and closing of the valves. It is located at the front of the engine.

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air: The air is the gas which is used in the combustion process. It is located at the front of the engine.

unit: The unit is a device which controls the speed of the engine. It is located at the front of the engine.

- Scintilla Division Bendix Corporation unit -
- injection

Fuel injection pump & nozzle of No. 5 & 6 on the
oil pump. No. 5 head of 1000 cc. 600 cc.
engine plan of Rocker Arm 9 in. 600 cc.
5 & 6 oil pump of 600 cc. 600 cc. Bendix scintilla
pump of 600 cc. 700 cc. 600 cc. nozzle
holders of 1000 cc. 600 cc. 600 cc.

- serge ① plunger and barrel
② control rock
③ sleeve & springs of well

1. Delivery valve on oil injection body
 2. Pump housing & sleeve nut
 3. Nozzle of barrel & nozzle adaptor plate
 4. Adaptor stop-plate
 5. Nozzle holder body
 6. Needle valve
 7. Chamber of nozzle
 8. Unit injector
 9. Flange mounted
 10. Bend pump

Pump Oil Tank Diagram; showing the connection between the oil tank and the engine. The diagram shows the oil tank at the top, connected by a pipe to the engine below. The pipe has a filter and a check valve. The engine is shown with its inlet port and fuel line. The unit injector is also shown, along with a head cap copper washer. The pump housing is shown at the bottom, connected to the fuel line. The diagram is labeled with various parts and their connections.

General Motors Unit Injection G.M

6. In fuel injection system of fuel injector
Fuel supply, Strainer & Fuel manifold.
No. 6000 Fuel injection pump, nozzle of fuel
4. 20, 60000: Unit Injector & 20000

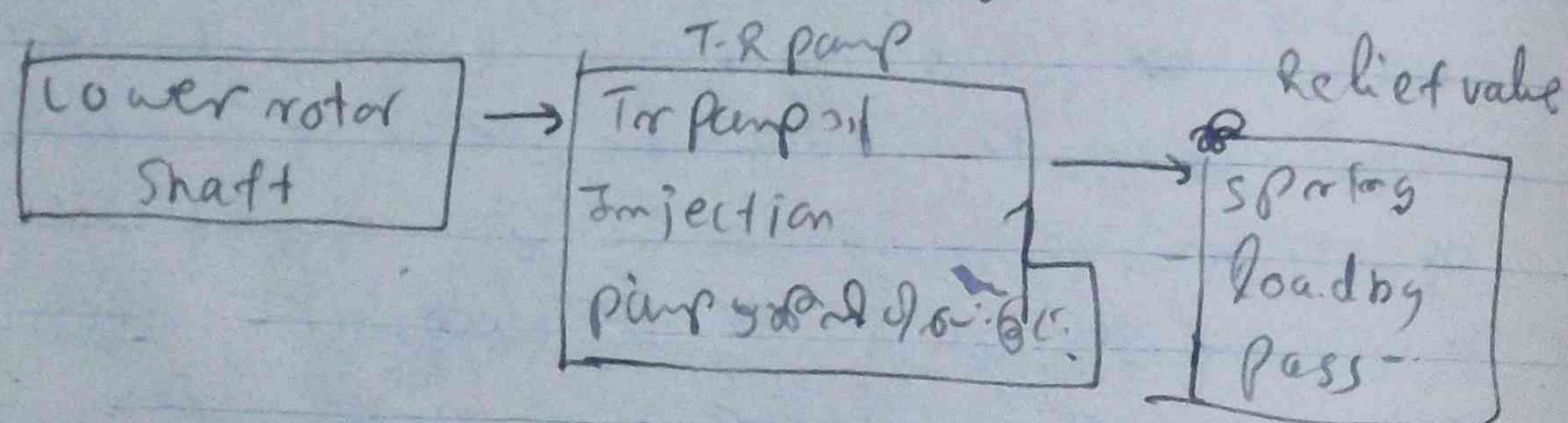
-
- The diagram illustrates the fuel injection system components and their flow:
- Engine cam** (6mm dia) → **Follower Rocker mechanism** → **Plunger 6mm dia** → **Spring return of 6mm dia** → **Oil Bushing** (Nozzle spray tip) → **Lower Port Jet** → **Lower check valve** → **Nozzle spray tip**
- The diagram is labeled **Fig. 1.1** and **Fuel Injection System**.

[illegible]

Fuel supply pump

Engine operating speed of fuel pump and Injection
 up to 2000 rpm. Fuel pump 20 psi fuel 20 psi 6 m unit
 Injector fuel system or positive displacement
 gear type Transfer pump and 20 psi

T.R Pump and Blower Housing gear 20 psi



Relief valve and pressure down
 Bypass valve of 20 psi pump or suction valve
 of 20 psi pressure of oil

Maintenance of Fuel Injection pump

Pump up to maintenance 6 m unit 20 psi 20 psi
 1. Present maintenance 2. Periodic
 inspection repair and over Haul 20 psi 20 psi
 20 psi 20 psi 20 psi 20 psi 20 psi 20 psi
 20 psi 20 psi 20 psi 20 psi 20 psi 20 psi

cleanliness
 Fuel injection equipment up to 20 psi 20 psi 20 psi
 20 psi 20 psi 20 psi 20 psi 20 psi 20 psi
 20 psi 20 psi 20 psi 20 psi 20 psi 20 psi

Fuel injection system up to 20 psi 20 psi 20 psi
 20 psi 20 psi 20 psi 20 psi 20 psi 20 psi
 20 psi 20 psi 20 psi 20 psi 20 psi 20 psi
 20 psi 20 psi 20 psi 20 psi 20 psi 20 psi

Fuel injection system up to 20 psi 20 psi 20 psi
 20 psi 20 psi 20 psi 20 psi 20 psi 20 psi
 20 psi 20 psi 20 psi 20 psi 20 psi 20 psi

Injection system up to 20 psi 20 psi 20 psi
 20 psi 20 psi 20 psi 20 psi 20 psi 20 psi
 20 psi 20 psi 20 psi 20 psi 20 psi 20 psi
 20 psi 20 psi 20 psi 20 psi 20 psi 20 psi

Installation of pump

[illegible][illegible]

multi plunger sc. Distribution Type Pump
used engine & not cylinder compression

[illegible][illegible]

pump calibration

Pump calibration at different rpm was given : 600 Engine
Speed & Load 76% 76% of pump & 1 cylinder up : 29.
2 5000 rpm 60% of 2 & 50% 1 cylinder up : 29.
2 5000 rpm 60% of 2 & 50% 1 cylinder up : 29.
Pump ↑ Test Bench Oil, oil & oil

① Individual pump

- [illegible]

② multi plunger pump

- Test bench for calibration & use
- Firing interval of pump driven by cam shaft on the crankshaft: Firing interval of 20° w.r.t. Tappet (2°) when 6° of 20°
- Firing interval of 20° and plunger on 20° cam
- gear segment of sleeve of crank
- sleeve gear. plunger on 20°
- pump unit on 20°

Prob 6: 67 m pump speed range at 2 diff. of 0.5 m

Plunger 51, Panel 6 on cylinder 51
other Speed unit: oil pumping unit m. r. 51 was
gone on 20/1/1975

6 m unit injector pump

മുഖ്യമന്ത്രിമാർ : മനോജ് കുമാർ, വി. എസ്. ശിവകുമാർ
 മുഖ്യമന്ത്രിമാർ

Part 5

Fuel injection system (nozzle)

Nozzle & Nozzle holder up. of 2: 60 p. Injection pump & air supply. Engine of 4 cylinder head & combustion chamber design at 4000 r.p.m. Nozzle & air supply & air supply & air supply. Nozzle up. of 2: 60 p. 100 p.

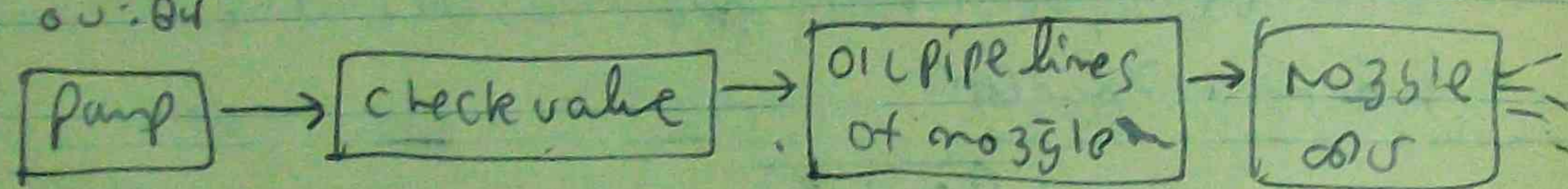
- ① open type
- ② differential needle valve (or) opening valves
- ③ out wordly opening poppet valve type

[illegible]

ഭരണസംസ്ഥാനം = 016

open nozzle

Open Nozzle
 Air injection of: 6000 rpm of engine 1 commin
 injection system of: 411 - 2200 rpm of pump
 of: 800 rpm of engine of compression stroke of nozzle
 of: 2000 rpm of compression of: 1000 rpm of injection of
 compression air of: cylinder of: 2000 rpm of 2000 rpm
 of: 2000 rpm



୧. ଶିଳ୍ପ ଶାସ୍ତ୍ର
 ୨. ଶିଳ୍ପ ଶାସ୍ତ୍ର

Differential needle value

Diesel Engine: 20:22:24:26: Nozzle & Spring
in: 60:62:64:66: Hydraulic 68:70:72:74: Needle
valve & type differential nozzle in: 76:78:80:82:84:86:88:90:92:94:96:98:100:102:104:106:108:110:112:114:116:118:120:122:124:126:128:130:132:134:136:138:140:142:144:146:148:150:152:154:156:158:160:162:164:166:168:170:172:174:176:178:180:182:184:186:188:190:192:194:196:198:200:202:204:206:208:210:212:214:216:218:220:222:224:226:228:230:232:234:236:238:240:242:244:246:248:250:252:254:256:258:260:262:264:266:268:270:272:274:276:278:280:282:284:286:288:290:292:294:296:298:300:302:304:306:308:310:312:314:316:318:320:322:324:326:328:330:332:334:336:338:340:342:344:346:348:350:352:354:356:358:360:362:364:366:368:370:372:374:376:378:380:382:384:386:388:390:392:394:396:398:400:402:404:406:408:410:412:414:416:418:420:422:424:426:428:430:432:434:436:438:440:442:444:446:448:450:452:454:456:458:460:462:464:466:468:470:472:474:476:478:480:482:484:486:488:490:492:494:496:498:500:502:504:506:508:510:512:514:516:518:520:522:524:526:528:530:532:534:536:538:540:542:544:546:548:550:552:554:556:558:560:562:564:566:568:570:572:574:576:578:580:582:584:586:588:590:592:594:596:598:600:602:604:606:608:610:612:614:616:618:620:622:624:626:628:630:632:634:636:638:640:642:644:646:648:650:652:654:656:658:660:662:664:666:668:670:672:674:676:678:680:682:684:686:688:690:692:694:696:698:700:702:704:706:708:710:712:714:716:718:720:722:724:726:728:730:732:734:736:738:740:742:744:746:748:750:752:754:756:758:760:762:764:766:768:770:772:774:776:778:780:782:784:786:788:790:792:794:796:798:800:802:804:806:808:810:812:814:816:818:820:822:824:826:828:830:832:834:836:838:840:842:844:846:848:850:852:854:856:858:860:862:864:866:868:870:872:874:876:878:880:882:884:886:888:890:892:894:896:898:900:902:904:906:908:910:912:914:916:918:920:922:924:926:928:930:932:934:936:938:940:942:944:946:948:950:952:954:956:958:960:962:964:966:968:970:972:974:976:978:980:982:984:986:988:990:992:994:996:998:1000:1002:1004:1006:1008:1010:1012:1014:1016:1018:1020:1022:1024:1026:1028:1030:1032:1034:1036:1038:1040:1042:1044:1046:1048:1050:1052:1054:1056:1058:1060:1062:1064:1066:1068:1070:1072:1074:1076:1078:1080:1082:1084:1086:1088:1090:1092:1094:1096:1098:1100:1102:1104:1106:1108:1110:1112:1114:1116:1118:1120:1122:1124:1126:1128:1130:1132:1134:1136:1138:1140:1142:1144:1146:1148:1150:1152:1154:1156:1158:1160:1162:1164:1166:1168:1170:1172:1174:1176:1178:1180:1182:1184:1186:1188:1190:1192:1194:1196:1198:1200:1202:1204:1206:1208:1210:1212:1214:1216:1218:1220:1222:1224:1226:1228:1230:1232:1234:1236:1238:1240:1242:1244:1246:1248:1250:1252:1254:1256:1258:1260:1262:1264:1266:1268:1270:1272:1274:1276:1278:1280:1282:1284:1286:1288:1290:1292:1294:1296:1298:1300:1302:1304:1306:1308:1310:1312:1314:1316:1318:1320:1322:1324:1326:1328:1330:1332:1334:1336:1338:1340:1342:1344:1346:1348:1350:1352:1354:1356:1358:1360:1362:1364:1366:1368:1370:1372:1374:1376:1378:1380:1382:1384:1386:1388:1390:1392:1394:1396:1398:1400:1402:1404:1406:1408:1410:1412:1414:1416:1418:1420:1422:1424:1426:1428:1430:1432:1434:1436:1438:1440:1442:1444:1446:1448:1450:1452:1454:1456:1458:1460:1462:1464:1466:1468:1470:1472:1474:1476:1478:1480:1482:1484:1486:1488:1490:1492:1494:1496:1498:1500:1502:1504:1506:1508:1510:1512:1514:1516:1518:1520:1522:1524:1526:1528:1530:1532:1534:1536:1538:1540:1542:1544:1546:1548:1550:1552:1554:1556:1558:1560:1562:1564:1566:1568:1570:1572:1574:1576:1578:1580:1582:1584:1586:1588:1590:1592:1594:1596:1598:1600:1602:1604:1606:1608:1610:1612:1614:1616:1618:1620:1622:1624:1626:1628:1630:1632:1634:1636:1638:1640:1642:1644:1646:1648:1650:1652:1654:1656:1658:1660:1662:1664:1666:1668:1670:1672:1674:1676:1678:1680:1682:1684:1686:1688:1690:1692:1694:1696:1698:1700:1702:1704:1706:1708:1710:1712:1714:1716:1718:1720:1722:1724:1726:1728:1730:1732:1734:1736:1738:1740:1742:1744:1746:1748:1750:1752:1754:1756:1758:1760:1762:1764:1766:1768:1770:1772:1774:1776:1778:1780:1782:1784:1786:1788:1790:1792:1794:1796:1798:1800:1802:1804:1806:1808:1810:1812:1814:1816:1818:1820:1822:1824:1826:1828:1830:1832:1834:1836:1838:1840:1842:1844:1846:1848:1850:1852:1854:1856:1858:1860:1862:1864:1866:1868:1870:1872:1874:1

Needle valve with spring
in fuel line of carburetor. High pressure fuel
in injection pump & injector
in diesel engine. In carburetor, fuel is drawn
from fuel tank by suction.

needle valve oil injection system. 2. 3. 4. 5. 6. 7. 8. 9. 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. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 8

Injection Pump ග ඔබේ ජ.ග්ලි. කිරීම: 1000 ක් ක් කිරීම: 2000.
 ව්‍යුත්: 10 ක් කිරීම: 2000, Spring 1000, needle valve 1000.
 ක් කිරීම: 1000 ක් කිරීම: 1000 ක් කිරීම: 1000 ක් කිරීම: 1000.
 ක් කිරීම: 1000 ක් කිරීම: 1000 ක් කිරීම: 1000 ක් කිරීම: 1000.
 Tip 1000 ක් කිරීම: 1000 ක් කිරීම: 1000 ක් කිරීම: 1000.

- ① ~~Pin~~ pin type
- ② Hole Type or Port type
Nozzle Holder

Engine head of nozzle of 64 mm and 67 mm
2 mm nozzle holder up. of 30:1 to 60:1 of 20:1 of
nozzle opening pressure of 20:1 of 20:1 of 20:1
adjuster up. of 30:1 of 30:1 of 30:1 of 30:1
of needle valve in 60:1 of 60:1 of 60:1 of 60:1

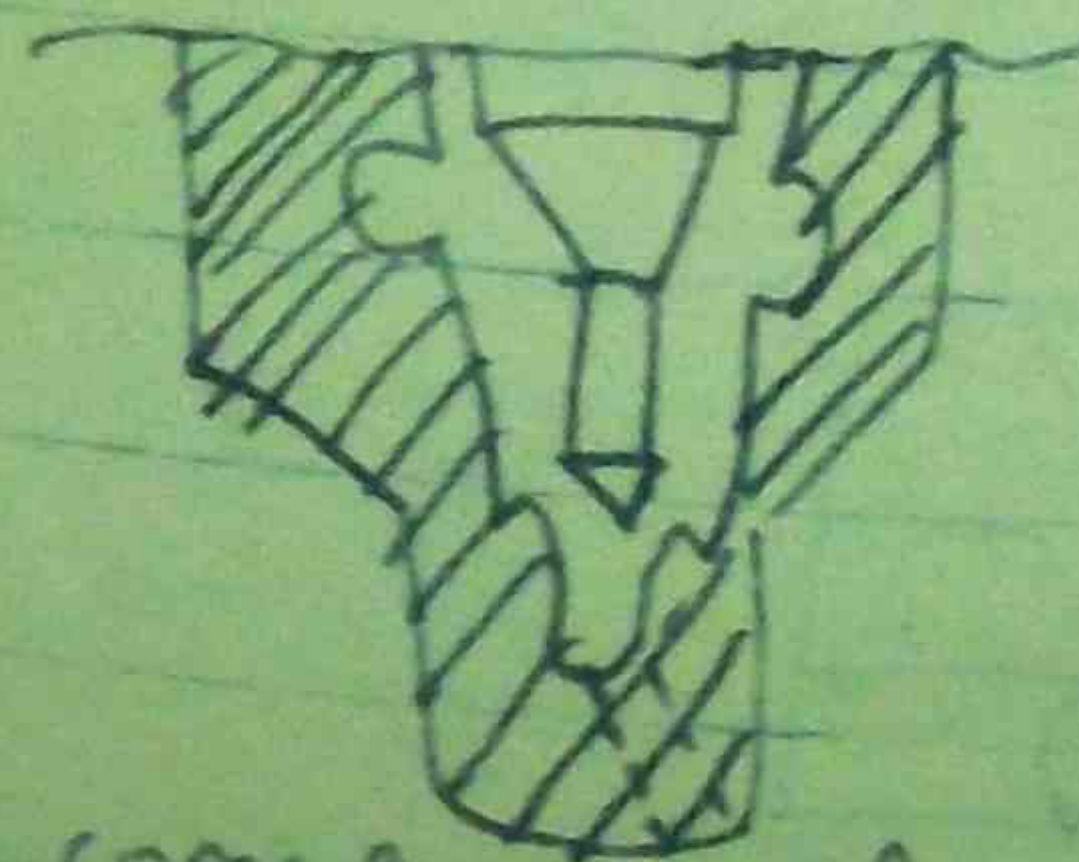
Nozzle Holder cooling

[illegible]

Double Angle valve seat Nozzle

① Combustion action: w/c need valve seat
but given 7m factor of 60.

② Injector characteristic of: 60: 2000



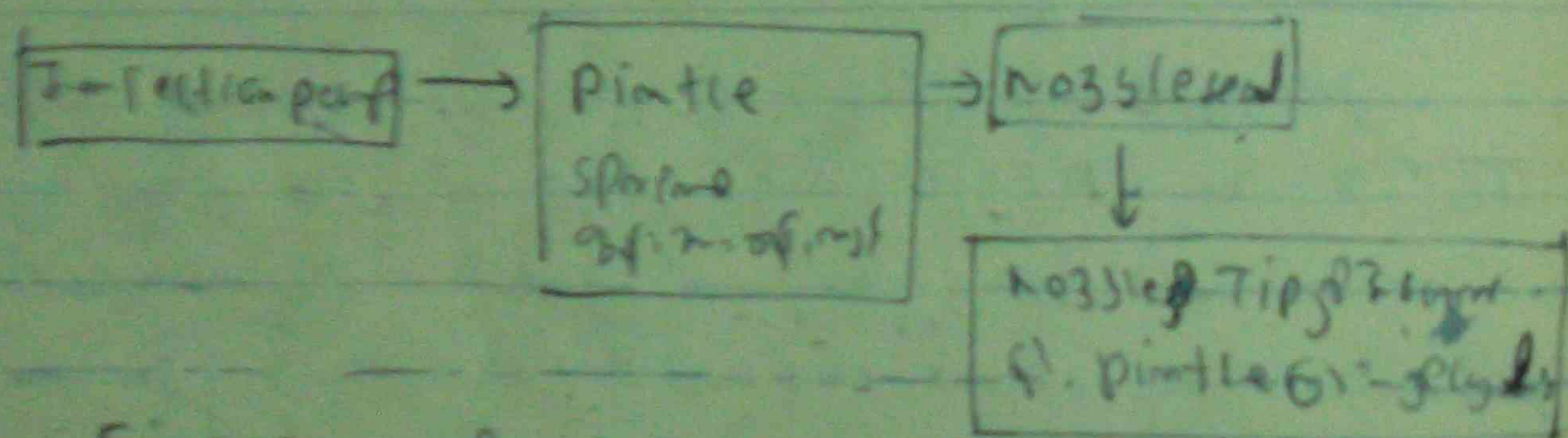
conventional
value & value seat



Robert Bosch Double
value & value seat.

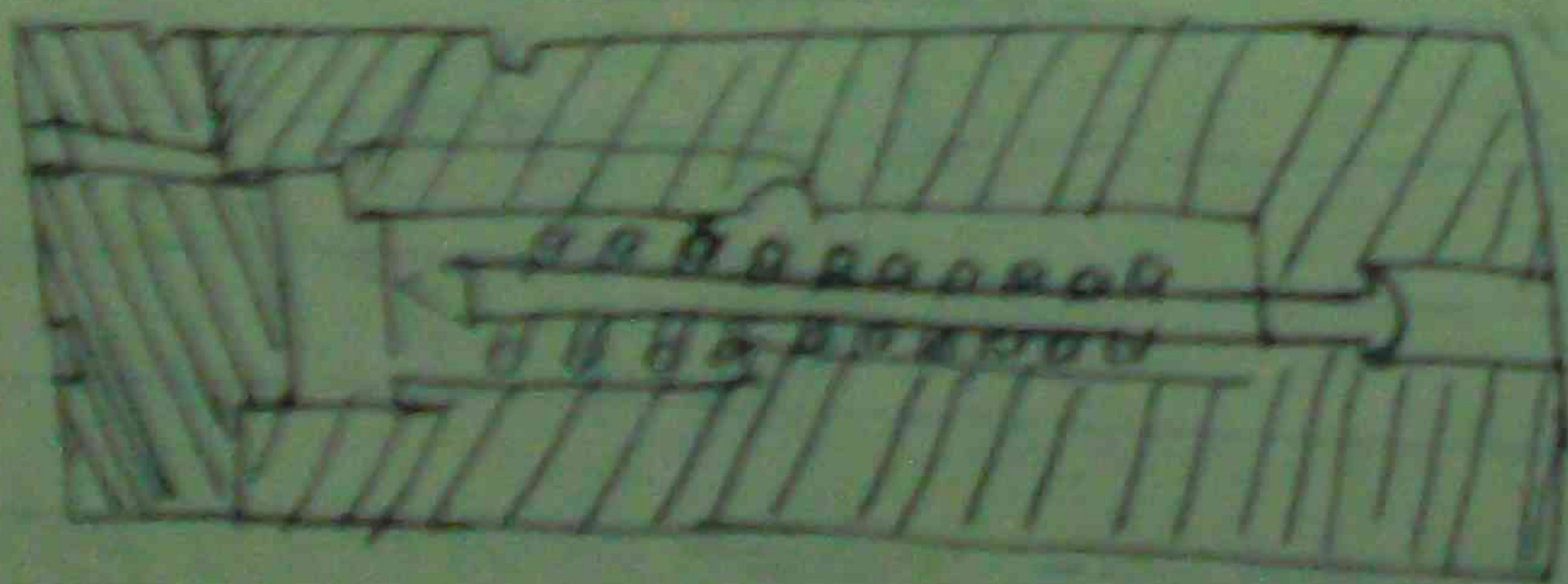
Poppet valve nozzle

- narrow conical spray of fuel
- nozzle tip & pintle springy & spring
- Hanger of nozzle body is of steel
- Pintle of spring is of steel & nozzle body is of steel & is of high strength & is of high strength
- High injection stroke



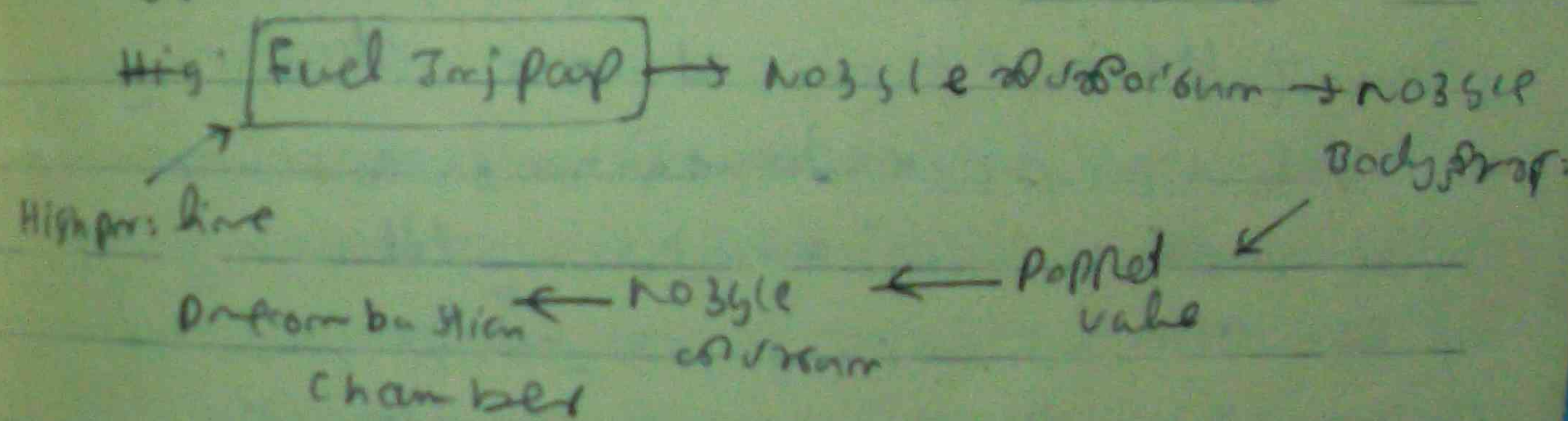
- Fine spray of fuel. Pre combustion chamber is of steel

Caterpillar nozzle



cross sectional of pintle type spray nozzle

- section of the nozzle combustion chamber is of steel & is of high strength & is of high strength
- nozzle assembly is of steel & is of high strength & is of high strength
- nozzle assembly is of steel & is of high strength & is of high strength
- section of the nozzle combustion chamber is of steel & is of high strength & is of high strength
- nozzle assembly is of steel & is of high strength & is of high strength
- section of the nozzle combustion chamber is of steel & is of high strength & is of high strength
- nozzle assembly is of steel & is of high strength & is of high strength



2. H. Nozzle

- nozzle fitting, spray valve assembly
- nozzle plate of, valve assembly of valve body & spring of, poppet valve of
- Injection pump → nozzle seat & nozzle plate

section of valve spring & spring compression pressure of the nozzle

E. m. NO351e

[illegible]

Fuel Atomization and Penetration

Diesel engine up: 2000 rpm, 1000 rpm, 500 rpm
speed 1000 rpm, 500 rpm, 200 rpm
combustion design 1000 rpm, 500 rpm
combustion chamber 1000 rpm, 500 rpm
cylinder 1000 rpm, 500 rpm
2000 rpm

[illegible]

Injection system consists of 6 or High Pressure

2nd floor: all 2nd floor walls & floor joists: 2nd floor
 concrete, 16" x 16" 6000-10000 PSI rebar of 16" x 16" 6000
 2nd floor walls & floor joists. 2nd floor walls & floor joists
 6" x 6" 16" x 16" 6000-10000 PSI rebar of 16" x 16" 6000
 outer dia 1/4" → 1/2" & all

calculation of nozzle orifice area

Quantity of fuel delivered = $Q = C_d A \sqrt{2P}$
per injection

Q = cumm | injection

C_d = coefficient of discharge of the nozzle orifice

A = Area (Total orifice) mm^2

$$A = \frac{0.0016 Q \sqrt{2P}}{C_d \alpha \sqrt{2P}} \text{ mm}^2$$

α = angle in degree of cam rotating during injection

n = cam shaft 2 per

C_d = .60 for sharp edge orifice at atomization poor penetration

C_d = .7 for rounded edge orifice poor atomization good penetration

C_d = .65 for average production nozzle orifice.

Nozzle Holder Symbols

B N 35 S 87

B = British made

N = Nozzle holder

35 = Barrel length in mm

S (t u v) nozzle holder size [Barrel diameter
87 = model no
25, 35, 45, 65]

Note

"D" added to side letter indicator

"D" oblique nozzle.

nos. spectre features

① B N 35 S 24

British nozzle holder, Barrel 35mm long 25mm dia 24 is all importance only when ordinary sprayers are seeking information

② B N 35 S 25

British made nozzle holder, Barrel 35mm long 25mm diameter delay type

③ British made nozzle holder, Barrel 67mm long (long stem) 25mm dia

B N 67 S 303

Nozzle Symbols

B N 30 S 2

3 = British D = nozzle Type Angle of spray 30

(or) L = Type letter (pintle or hole) second L indicator long stem nos angles of spray

St (or) U = side letter (AS nozzle holder) nos. special features

calculation of nozzle orifice area

Quantity of fuel delivered = $Q = C_d A \sqrt{V}$
per injection

Q = cumm / injection
 C_d = coefficient of discharge of the nozzle orifice
 A = Area (Total orifice) mm^2

$$A = \frac{0.0016 Q N}{V f \alpha \sqrt{\frac{P}{\rho g \alpha}}} \text{ mm}^2$$

α = angle in degree of cam rotating during injection

N = cam shaft Rpm

C_d = .60 for sharp edge orifice at atomization poor penetration

C_d = .7 for rounded edge orifice poor atomization good penetration

C_d = 0.65 for average production nozzle orifice.

Nozzle Holder Symbols

B U B 35 S 87

B = British made

U = Nozzle holder

35 = Barrel length in mm

S (+ u v) nozzle holder size [Barrel diameter
87 = model no
25, 35, 45, 65]

Note

'D' added to side letter indicator

'D' obg nozzle.

nos spectacle features

① B U B 35 S 24

British nozzle holder, Barrel 35mm long
25mm dia 24 is all importance only when
ordinary spares on seeking information

② B U B 35 S D S1

British made nozzle holder, Barrel 35mm
long 25mm diameter Delay Type

③ British made nozzle holder, Barrel
67mm long (long stem) 25mm dia

B U B L 67 S 303

Nozzle Symbols

B D N 30 S L

B = British D = nozzle Type Angle of
spray 30

L = Type letter (pintle or hole) second L indicator
long stem nos angles of spray

st w (or) v = side letter (As nozzle holder)

80 N 3052

British made nozzle pintle type 30
angle of spray 25mm barrel diameter

② 80 L L 1505, 525

British made nozzle, Hole type long stem
150 angle of spray 25mm barrel diameter

Maintenance of fuel injection nozzle

① Nozzle orifice: if it is clogged: stop of engine etc.

② Fuel pump: stop of engine etc.

③ Nozzle and orifice: if it is clogged: stop of engine etc.

④ Dust

Nozzle and orifice: if it is clogged: stop of engine etc.
Valve stem, seat of valve and its guide: if it is clogged: stop of engine etc.
Nozzle orifice: if it is clogged: stop of engine etc.
Fuel pump: if it is clogged: stop of engine etc.
Injection pump: if it is clogged: stop of engine etc.
Injection pressure: if it is low: stop of engine etc.

Atomization of fuel: if it is poor: stop of engine etc.
Fuel: if it is poor: stop of engine etc.
Carbon: if it is poor: stop of engine etc.
Carbon: if it is poor: stop of engine etc.
Needle valve: if it is poor: stop of engine etc.
Needle valve: if it is poor: stop of engine etc.
Timing: if it is poor: stop of engine etc.
Timing: if it is poor: stop of engine etc.
Timing: if it is poor: stop of engine etc.
Timing: if it is poor: stop of engine etc.
Timing: if it is poor: stop of engine etc.

② Over heat

Engine over load: if it is poor: stop of engine etc.
Cooling system: if it is poor: stop of engine etc.
Over heat: if it is poor: stop of engine etc.
Over heat: if it is poor: stop of engine etc.
Over heat: if it is poor: stop of engine etc.
Over heat: if it is poor: stop of engine etc.

Carbon: if it is poor: stop of engine etc.
Needle valve seat: if it is poor: stop of engine etc.
Valve stem: if it is poor: stop of engine etc.
Valve stem: if it is poor: stop of engine etc.
Valve stem: if it is poor: stop of engine etc.
Valve stem: if it is poor: stop of engine etc.

Over heat: if it is poor: stop of engine etc.

- ③ water

Locating Defective Nozzle

② Engine nozzle air: 870: 7400
65: 9700. 9700: 6061.

Q. Engine of: car, of High pressure tubing up: of
oil: 2000 psi. Pipe of: 2000 psi: 6000 psi
of 3000 psi: of 2000 psi. 2000 psi: 6000 psi
Pressure tubing of: 2000 psi. Engine up: of oil: 2000 psi
up: 2000 psi

③ 2nd. Engine up. of pump a. i. 2nd 2nd 2nd
 4th. 2nd. 6th. 10th. 14th. 18th. 22nd. 26th. 30th. 34th. 38th. 42th. 46th. 50th. 54th. 58th. 62th. 66th. 70th. 74th. 78th. 82th. 86th. 90th. 94th. 98th. 100th. 104th. 108th. 112th. 116th. 120th. 124th. 128th. 132th. 136th. 140th. 144th. 148th. 152th. 156th. 160th. 164th. 168th. 172th. 176th. 180th. 184th. 188th. 192th. 196th. 200th. 204th. 208th. 212th. 216th. 220th. 224th. 228th. 232th. 236th. 240th. 244th. 248th. 252th. 256th. 260th. 264th. 268th. 272th. 276th. 280th. 284th. 288th. 292th. 296th. 300th. 304th. 308th. 312th. 316th. 320th. 324th. 328th. 332th. 336th. 340th. 344th. 348th. 352th. 356th. 360th. 364th. 368th. 372th. 376th. 380th. 384th. 388th. 392th. 396th. 400th. 404th. 408th. 412th. 416th. 420th. 424th. 428th. 432th. 436th. 440th. 444th. 448th. 452th. 456th. 460th. 464th. 468th. 472th. 476th. 480th. 484th. 488th. 492th. 496th. 500th. 504th. 508th. 512th. 516th. 520th. 524th. 528th. 532th. 536th. 540th. 544th. 548th. 552th. 556th. 560th. 564th. 568th. 572th. 576th. 580th. 584th. 588th. 592th. 596th. 600th. 604th. 608th. 612th. 616th. 620th. 624th. 628th. 632th. 636th. 640th. 644th. 648th. 652th. 656th. 660th. 664th. 668th. 672th. 676th. 680th. 684th. 688th. 692th. 696th. 700th. 704th. 708th. 712th. 716th. 720th. 724th. 728th. 732th. 736th. 740th. 744th. 748th. 752th. 756th. 760th. 764th. 768th. 772th. 776th. 780th. 784th. 788th. 792th. 796th. 800th. 804th. 808th. 812th. 816th. 820th. 824th. 828th. 832th. 836th. 840th. 844th. 848th. 852th. 856th. 860th. 864th. 868th. 872th. 876th. 880th. 884th. 888th. 892th. 896th. 900th. 904th. 908th. 912th. 916th. 920th. 924th. 928th. 932th. 936th. 940th. 944th. 948th. 952th. 956th. 960th. 964th. 968th. 972th. 976th. 980th. 984th. 988th. 992th. 996th. 1000th. 1004th. 1008th. 1012th. 1016th. 1020th. 1024th. 1028th. 1032th. 1036th. 1040th. 1044th. 1048th. 1052th. 1056th. 1060th. 1064th. 1068th. 1072th. 1076th. 1080th. 1084th. 1088th. 1092th. 1096th. 1100th. 1104th. 1108th. 1112th. 1116th. 1120th. 1124th. 1128th. 1132th. 1136th. 1140th. 1144th. 1148th. 1152th. 1156th. 1160th. 1164th. 1168th. 1172th. 1176th. 1180th. 1184th. 1188th. 1192th. 1196th. 1200th. 1204th. 1208th. 1212th. 1216th. 1220th. 1224th. 1228th. 1232th. 1236th. 1240th. 1244th. 1248th. 1252th. 1256th. 1260th. 1264th. 1268th. 1272th. 1276th. 1280th. 1284th. 1288th. 1292th. 1296th. 1300th. 1304th. 1308th. 1312th. 1316th. 1320th. 1324th. 1328th. 1332th. 1336th. 1340th. 1344th. 1348th. 1352th. 1356th. 1360th. 1364th. 1368th. 1372th. 1376th. 1380th. 1384th. 1388th. 1392th. 1396th. 1400th. 1404th. 1408th. 1412th. 1416th. 1420th. 1424th. 1428th. 1432th. 1436th. 1440th. 1444th. 1448th. 1452th. 1456th. 1460th. 1464th. 1468th. 1472th. 1476th. 1480th. 1484th. 1488th. 1492th. 1496th. 1500th. 1504th. 1508th. 1512th. 1516th. 1520th. 1524th. 1528th. 1532th. 1536th. 1540th. 1544th. 1548th. 1552th. 1556th. 1560th. 1564th. 1568th. 1572th. 1576th. 1580th. 1584th. 1588th. 1592th. 1596th. 1600th. 1604th. 1608th. 1612th. 1616th. 1620th. 1624th. 1628th. 1632th. 1636th. 1640th. 1644th. 1648th. 1652th. 1656th. 1660th. 1664th. 1668th. 1672th. 1676th. 1680th. 1684th. 1688th. 1692th. 1696th. 1700th. 1704th. 1708th. 1712th. 1716th. 1720th. 1724th. 1728th. 1732th. 1736th. 1740th. 1744th. 1748th. 1752th. 1756th. 1760th. 1764th. 1768th. 1772th. 1776th. 1780th. 1784th. 1788th. 1792th. 1796th. 1800th. 1804th. 1808th. 1812th. 1816th. 1820th. 1824th. 1828th. 1832th. 1836th. 1840th. 1844th. 1848th. 1852th. 1856th. 1860th. 1864th. 1868th. 1872th. 1876th. 1880th. 1884th. 1888th. 1892th. 1896th. 1900th. 1904th. 1908th. 1912th. 1916th. 1920th. 1924th. 1928th. 1932th. 1936th. 1940th. 1944th. 1948th. 1952th. 1956th. 1960th. 1964th. 1968th. 1972th. 1976th. 1980th. 1984th. 1988th. 1992th. 1996th. 2000th. 2004th. 2008th. 2012th. 2016th. 2020th. 2024th. 2028th. 2032th. 2036th. 2040th. 2044th. 2048th. 2052th. 2056th. 2060th. 2064th. 2068th. 2072th. 2076th. 2080th. 2084th. 2088th. 2092th. 2096th. 2100th. 2104th. 2108th. 2112th. 2116th. 2120th. 2124th. 2128th. 2132th. 2136th. 2140th. 2144th. 2148th. 2152th. 2156th. 2160th. 2164th. 2168th. 2172th. 2176th. 2180th. 2184th. 2188th. 2192th. 2196th. 2200th. 2204th. 2208th. 2212th. 2216th. 2220th. 2224th. 2228th. 2232th. 2236th. 2240th. 2244th. 2248th. 2252th. 2256th. 2260th. 2264th. 2268th. 2272th. 2276th. 2280th. 2284th. 2288th. 2292th. 2296th. 2300th. 2304th. 2308th. 2312th. 2316th. 2320th. 2324th. 2328th. 2332th. 2336th. 2340th. 2344th. 2348th. 2352th. 2356th. 2360th. 2364th. 2368th. 2372th. 2376th. 2380th. 2384th. 2388th. 2392th. 2396th. 2400th. 2404th. 2408th. 2412th. 2416th. 2420th. 2424th. 2428th. 2432th. 2436th. 2440th. 2444th. 2448th. 2452th. 2456th. 2460th. 2464th. 2468th. 2472th. 2476th

② Nozzle bleeding current not over 6A.

(b) High pressure tubing for nozzle and joint
of nozzle & joint. nozzle & joint

[illegible]

Nozzle Testing

nozzle and nozzle tester for. 6mm orifice:
2.5660; 2.5675; 2.5690

- ① valve opening pressure
- ② Spring characteristics
- ③ General leakage
- ④ unloading (leakage at tip)
- ⑤ Popping
- ⑥ Chattering

nozzle diff. from old one. of old one. of 70000000
nozzle diff. of old one. of 70000000
nozzle diff. of old one. of 70000000
nozzle diff. of old one. of 70000000

စမ္မာသမုဒ္ဓိဝါ

open type no 331e

Spring 2 of G. on: no oil of 22nd: 6th: 2 of 12: 8 of 627
nozzle 6 of 12, American Bosch 1/2 inch, water pillar
close: generator nozzle of, no oil

closed type nozzle

Hydraulic g. & control of ~~operation~~ g. of motor
on differential needle valve nozzle on ~~the~~ 4
Hold g. pintle type ~~control~~ 11

Testing open nozzle

Open nozzle or opening pressure & seating
effectiveness will be: 1. 2. 3. 4. 5. 6. 7. 8. 9. 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. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837.

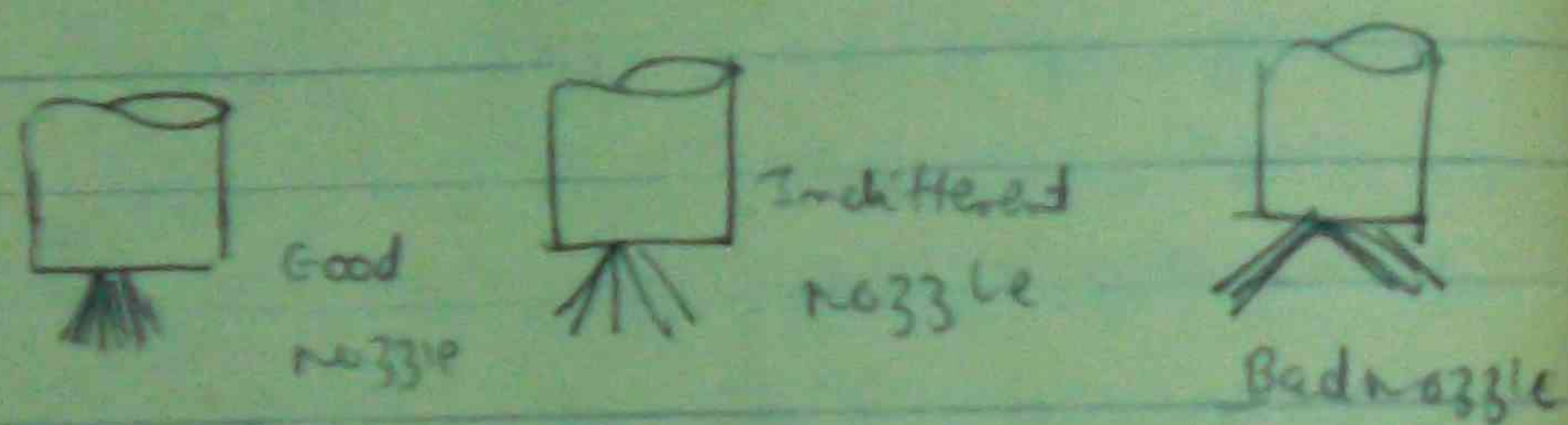
sendung effectiveness (ပို့ဆောင်မှု ထိရောက်မှု)

(1) Test purg & pressure opening pressure of nozzle
of nozzle gun. In test, nozzle gun will be used
as follows [spray gun nozzle gun nozzle gun
gun gun gun gun gun gun gun gun gun gun gun gun
gun gun gun gun gun gun gun gun gun gun gun gun
gun gun gun gun gun gun gun gun gun gun gun gun]

[illegible]

Don't want to throttle action, but we will try
to find a test pump at 300 psi and use it to
test the nozzle or valve of seat up and down
and find out

നോട്ടീഷ് നൽകിയതിനുശേഷം: 15.06.2023
 സ്പ്രേ പാറ്റേൺ: 15.06.2023



Nozzle Replacement

again the nozzle of 600, for engine 701, 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, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

ന: മലയാളം = 9 06 14 20: 00, 2022.

[illegible]

$\frac{1}{100} = 0.01$
 value of $\frac{1}{100} = 0.01$ is 1% of 100
 $0.01 \times 100 = 1$ is 1% of 100
 and 1% of 100 is 1

$v = \text{linear speed in ft/sec} = f' \cdot d$ of revolution of fly mass
 $F_c = \text{centrifugal force (lbs)}$ $r = \text{effective radius}$
 $w = \text{weight of fly weight (lbs)}$ at rotation of fly
 $N = \text{r.p.m. of ball head}$ weight gram

$$F_c = .000284 w N^2 r$$

operation

[illegible]

Flyweight of governor concerning centrifugal force of governor spring in case of governor spring of governor force of governor flyweight of governor governor speeder rod force of governor governor control rod of governor governor of governor governor of engine governor speeder of governor flyweight of governor centrifugal force of governor spring of governor

connecting rod of spring 2008 & roller rod of 2008
2008: engine of 2008: 2008

- ① constant speed governor } mech. gov. 1st type
② variable speed governor }

① Limiting speed governor

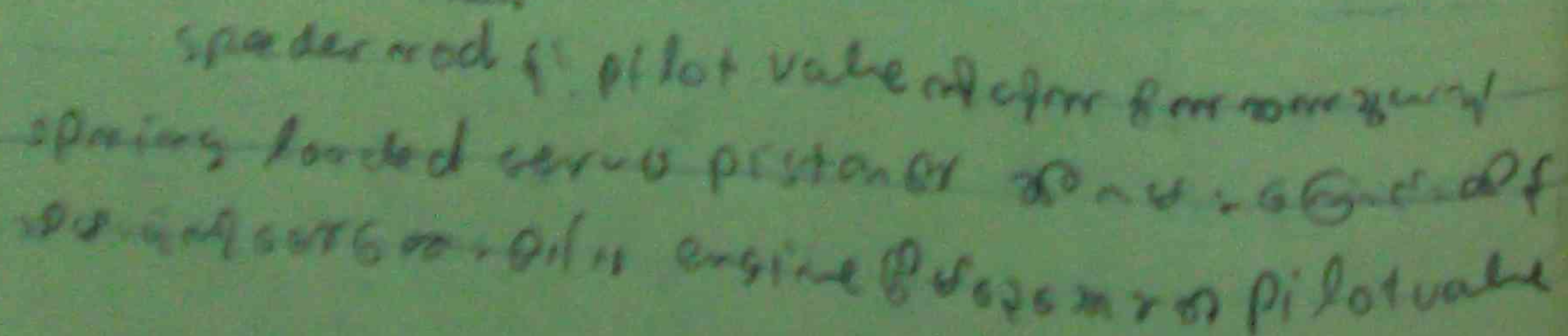
of governor of Engine at idle & maximum speed of governor is 7-8 rpm of 60: 3300 Idle & maximum speed 700: Intermediated speed of external Throttle lever governor speed spring at 60 min of 60: 60: 60, of 60: 60: 60

Fuel injection pump's limiting speed governor
of govt & co: 6000 rpm governor shaft with inner spring
w/ engine oil Idle speed of oil = 980 rpm outer spring
f, Inner speed spring 1700 rpm max speed
of oil = 600 rpm External lever w/ vertical
fulcrum lever system, speeder spring @ 1600 rpm
600 rpm f, Idle speed f, maximum speed 1700 rpm
speed of oil 2000 rpm

Governing weight vs vertical fulcrum -
limiting speed governor
load up: 800-1000: 600-700 engine



Engine cam: 41° of 180° cam; speed of: 3000 r.p.m.
 180° cam; 7000 r.p.m. (4 + head 9), Pilot valve of 180° cam
 180°: 91. 7300 r.p.m.: 21: 2000 r.p.m. 7000



Prerogative Governor or

Tractor 91. motor und engine un. 98, 102, 104

① 7 sections

Engine speed of 1500 rpm. 6000 rpm engine
speed is 6000 rpm

② Red drop

engine or ref. 4) 6000 rpm
 engine speed at 0% load: 6000 rpm
 engine rated power output at rated speed
 of zero power output 700 x 2.2 = 1540 W
 minimum speed 6000 rpm

$$\text{speed drop} = \frac{V_0 - V_r}{V_r} \times 100$$

$$V_r = \text{rated speed (r.p.m.)}$$

$$V_0 = \text{speed at no load (r.p.m.)}$$

Stability

engine: The variation of engine speed due to

speed of speed 66% - 4.5% variation of speed of engine

Governor Symbols

| | | | | | | |
|---|---|-----|-----|---|---|----|
| B | R | 200 | 950 | B | F | G2 |
|---|---|-----|-----|---|---|----|

B - British made

R = Regulator (or) governor

200 = Idling speed (r.p.m.)

950 = maximum speed (r.p.m.)

B - plunger stroke (as pump)

F - Design chamber letter

G2 = special features (as pump)

Pneumatic Governor

| | | | | | | |
|---|----|---|---|----|---|-----|
| B | EP | M | N | 80 | A | 144 |
|---|----|---|---|----|---|-----|

B - British made

EP = Pneumatic governor

M = Diaphragm type

N = adjust cam higher idles speed

80 (80) = Diaphragm diameter in mm

A = plunger stroke (as pump)

144 = special features

Part 3

supercharging

Internal combustion engine or gas engine power

2.5%: 2.5%: 2.5%

① Intake stroke of cylinder in 2.5%: 2.5%: 2.5%

② compression stroke of cylinder of 2.5%: 2.5%: 2.5%

③ Engine cycle of Thermodynamics effect of 2.5%: 2.5%: 2.5%

Engine speed of 2.5%: 2.5%: 2.5%
 2.5%: 2.5%: 2.5%
 2.5%: 2.5%: 2.5%
 2.5%: 2.5%: 2.5%
 2.5%: 2.5%: 2.5%
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High speed engine or 2.5%: 2.5%: 2.5%
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Blowers for supercharging

Supercharging ~~and~~ Blower 20.12.21

- ① positive displacement blower

- ② centrifugal blower of 6000

reciprocating, eccentric valve, rotary blower of, 225

positive displacement blower rule: $\frac{Z_1 V_1}{T_1} = \frac{Z_2 V_2}{T_2}$

(Rotary Blower)

Rotary blower: Root type blower $\gamma \sim 2.5$ or 3 sig.

Өлчөгдөх лоб зүгээр 3 хувиар тогтоож өгсөн мотор
зүгээр шалтгаангүйгээр үргэлж үйлдвэрлэж байгаа нь

axle: shaft of: gear component of, p. 21

[illegible]

P_m = engine or power (hp) P_{gear} = power of a gear, 6 gear: 50 hp

58. Shaft y anal. gear normal y (68. m) 5 shaft anal 66 m 58 m 58 m

~~rotor m: (l: m: (l: rotor ~ y6ja 7 n rotor q. Qil lones).~~

2. motor is lobed. aqf, aq uad 6011. $\gamma_1 = \gamma_2 \approx \gamma$ (ergon)

Yoke joint: give clearance to the upper part of casing & joint

6. 2005-02-28 - 2: 47: 50: 00: 00. Roter up: ~ 2' ~ 2' 50' 70'

causing of: $\sim 60\%$ of u & 60% of v || discharge passage of.

6-7.60: 23.50 4.50 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00 18.00 19.00 20.00 21.00 22.00 23.00 24.00 25.00 26.00 27.00 28.00 29.00 30.00 31.00 32.00 33.00 34.00 35.00 36.00 37.00 38.00 39.00 40.00 41.00 42.00 43.00 44.00 45.00 46.00 47.00 48.00 49.00 50.00 51.00 52.00 53.00 54.00 55.00 56.00 57.00 58.00 59.00 60.00 61.00 62.00 63.00 64.00 65.00 66.00 67.00 68.00 69.00 70.00 71.00 72.00 73.00 74.00 75.00 76.00 77.00 78.00 79.00 80.00 81.00 82.00 83.00 84.00 85.00 86.00 87.00 88.00 89.00 90.00 91.00 92.00 93.00 94.00 95.00 96.00 97.00 98.00 99.00 100.00 101.00 102.00 103.00 104.00 105.00 106.00 107.00 108.00 109.00 110.00 111.00 112.00 113.00 114.00 115.00 116.00 117.00 118.00 119.00 120.00 121.00 122.00 123.00 124.00 125.00 126.00 127.00 128.00 129.00 130.00 131.00 132.00 133.00 134.00 135.00 136.00 137.00 138.00 139.00 140.00 141.00 142.00 143.00 144.00 145.00 146.00 147.00 148.00 149.00 150.00 151.00 152.00 153.00 154.00 155.00 156.00 157.00 158.00 159.00 160.00 161.00 162.00 163.00 164.00 165.00 166.00 167.00 168.00 169.00 170.00 171.00 172.00 173.00 174.00 175.00 176.00 177.00 178.00 179.00 180.00 181.00 182.00 183.00 184.00 185.00 186.00 187.00 188.00 189.00 190.00 191.00 192.00 193.00 194.00 195.00 196.00 197.00 198.00 199.00 200.00 201.00 202.00 203.00 204.00 205.00 206.00 207.00 208.00 209.00 210.00 211.00 212.00 213.00 214.00 215.00 216.00 217.00 218.00 219.00 220.00 221.00 222.00 223.00 224.00 225.00 226.00 227.00 228.00 229.00 230.00 231.00 232.00 233.00 234.00 235.00 236.00 237.00 238.00 239.00 240.00 241.00 242.00 243.00 244.00 245.00 246.00 247.00 248.00 249.00 250.00 251.00 252.00 253.00 254.00 255.00 256.00 257.00 258.00 259.00 260.00 261.00 262.00 263.00 264.00 265.00 266.00 267.00 268.00 269.00 270.00 271.00 272.00 273.00 274.00 275.00 276.00 277.00 278.00 279.00 280.00 281.00 282.00 283.00 284.00 285.00 286.00 287.00 288.00 289.00 290.00 291.00 292.00 293.00 294.00 295.00 296.00 297.00 298.00 299.00 300.00 301.00 302.00 303.00 304.00 305.00 306.00 307.00 308.00 309.00 310.00 311.00 312.00 313.00 314.00 315.00 316.00 317.00 318.00 319.00 320.00 321.00 322.00 323.00 324.00 325.00 326.00 327.00 328.00 329.00 330.00 331.00 332.00 333.00 334.00 335.00 336.00 337.00 338.00 339.00 340.00 341.00 342.00 343.00 344.00 345.00 346.00 347.00 348.00 349.00 350.00 351.00 352.00 353.00 354.00 355.00 356.00 357.00 358.00 359.00 360.00 361.00 362.00 363.00 364.00 365.00 366.00 367.00 368.00 369.00 370.00 371.00 372.00 373.00 374.00 375.00 376.00 377.00 378.00 379.00 380.00 381.00 382.00 383.00 384.00 385.00 386.00 387.00 388.00 389.00 390.00 391.00 392.00 393.00 394.00 395.00 396.00 397.00 398.00 399.00 400.00 401.00 402.00 403.00 404.00 405.00 406.00 407.00 408.00 409.00 410.00 411.00 412.00 413.00 414.00 415.00 416.00 417.00 418.00 419.00 420.00 421.00 422.00 423.00 424.00 425.00 426.00 427.00 428.00 429.00 430.00 431.00 432.00 433.00 434.00 435.00 436.00 437.00 438.00 439.00 440.00 441.00 442.00 443.00 444.00 445.00 446.00 447.00 448.00 449.00 450.00 451.00 452.00 453.00 454.00 455.00 456.00 457.00 458.00 459.00 460.00 461.00 462.00 463.00 464.00 465.00 466.00 467.00 468.00 469.00 470.00 471.00 472.00 473.00 474.00 475.00 476.00 477.00 478.00 479.00 480.00 481.00 482.00 483.00 484.00 485.00 486.00 487.00 488.00 489.00 490.00 491.00 492.00 493.00 494.00 495.00 496.00 497.00 498.00 499.00 500.00 501.00 502.00 503.00 504.00 505.00 506.00 507.00 508.00 509.00 510.00 511.00 512.00 513.00 514.00 515.00 516.00 517.00 518.00 519.00 520.00 521.00 522.00 523.00 524.00 525.00 526.00 527.00 528.00 529.00 530.00 531.00 532.00 533.00 534.00 535.00 536.00 537.00 538.00 539.00 540.00 541.00 542.00 543.00 544.00 545.00 546.00 547.00 548.00 549.00 550.00 551.00 552.00 553.00 554.00 555.00 556.00 557.00 558.00 559.00 560.00 561.00 562.00 563.00 564.00 565.00 566.00 567.00 568.00 569.00 570.00 571.00 572.00 573.00 574.00 575.00 576.00 577.00 578.00 579.00 580.00 581.00 582.00 583.00 584.00 585.00 586.00 587.00 588.00 589.00 590.00 591.00 592.00 593.00 594.00 595.00 596.00 597.00 598.00 599.00 600.00 601.00 6

[illegible]

Engine power of 1.6 with max engine speed

engine speed ref. 1000 rpm for 1000 rpm

2011-2000 → 6000

Q: 25707061

② centrifugal Blower

centrifugal blower

Ground floor: ~~~~~ High ceiling: single

stage compressor at a $\eta_{comp} = 0.8$. Pressure ratio 3:1 & d.

სიწმინდის სახელით: ღმერთი: მღვდელისა და 10000 და 50000 სტამბა

Q: Explain the various types of High speed mechanism and their

Indoor nuclear engines of mfr. conf. 2500000

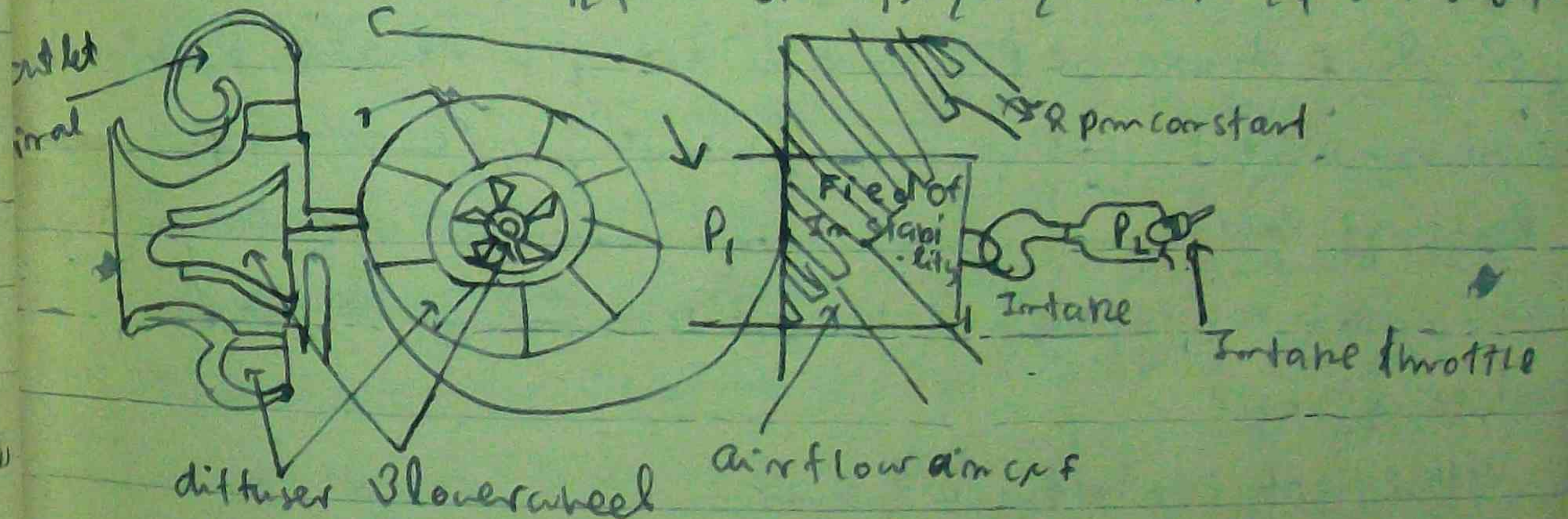


Diagram of a centrifugal Blower.

6-10-2017 Blower pit & Blower wheel.

Blower wheel [counter clockwise]

[illegible]

Diffuser in the water

600m SF: 600m: 600m - 600m spiral casting

... in the manifold of q, q, q ...

Section 1: 1600 - 1800: open passage up to 1800.

Handwritten text on a separate piece of paper, likely a continuation of the notes or a separate entry, mentioning "National Academy of Sciences" and "National Academy of Medicine".

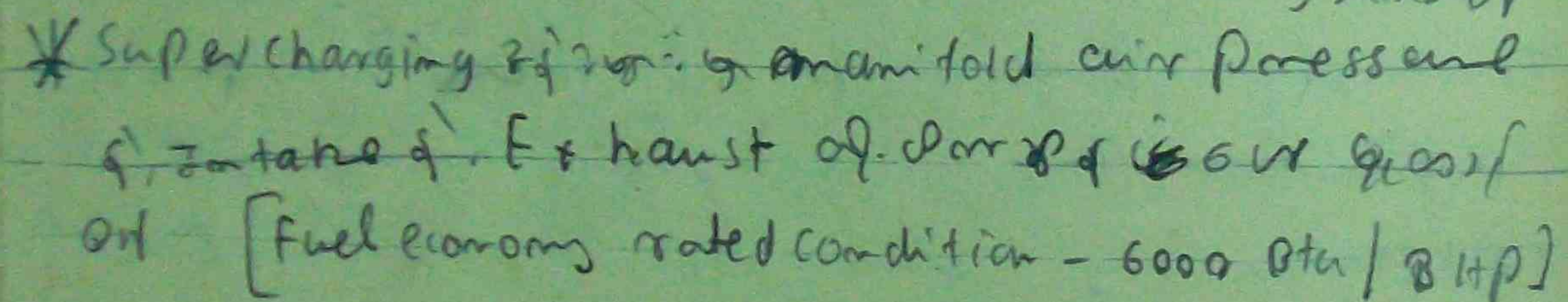
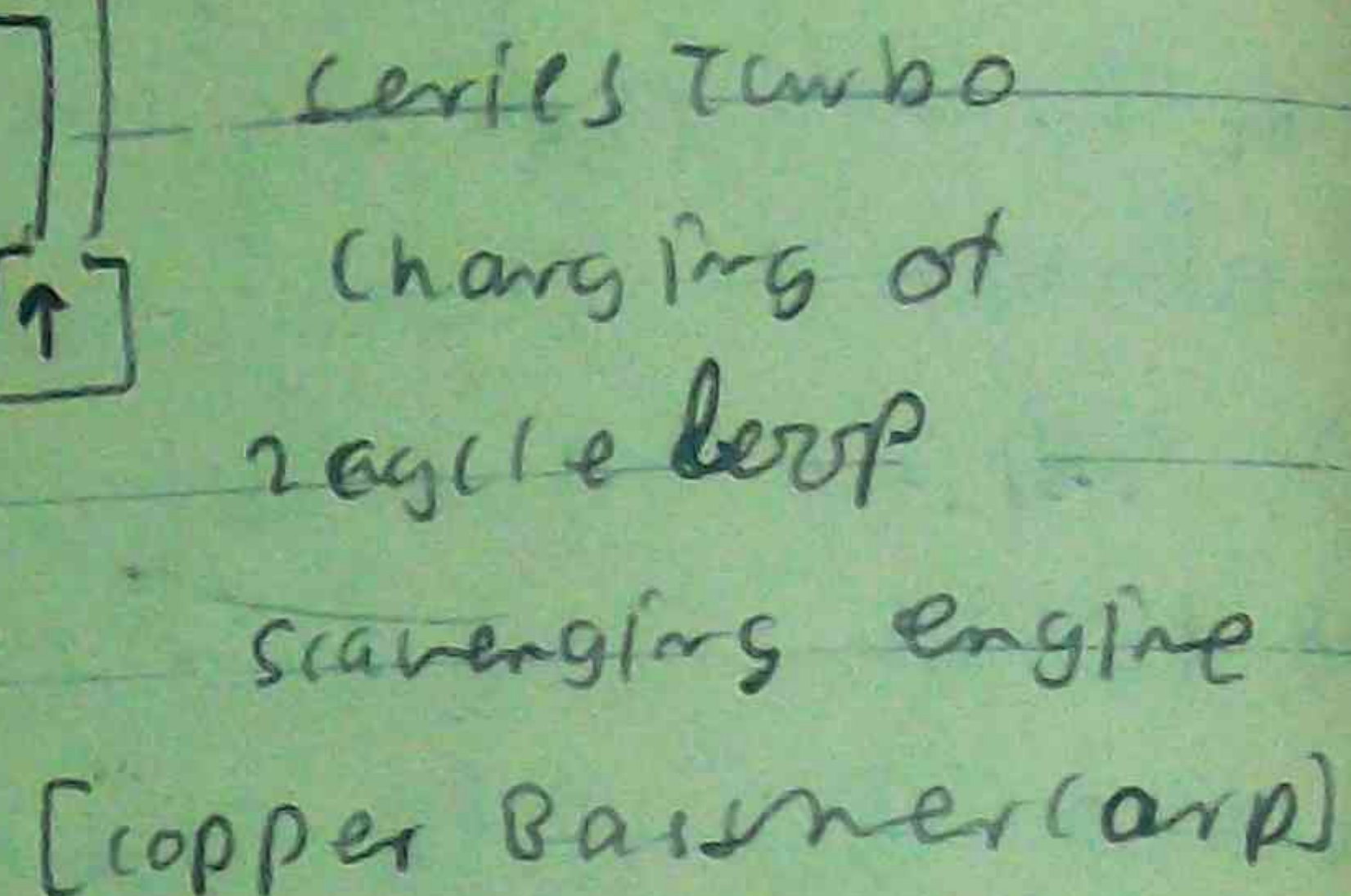
நாடு 1000 க்கு 2021

work at an: 600 speed air of 27000 ~ 1000 g/l.
pressure ratio of 1.7925 centrifugal air blower
Impeller ex & rotor of 1. Diffuser of 1 design of 1
an: 150 of 206200 m³/s of 1. Blower efficiency 86%.
ex: 100% of 106200 m³/s = 100% efficiency index.

Rotary & centrifugal Blower vs. 3rd engine
 4th engine vs. 5th. P.C.: electric motor vs. 1st, 6th
 4th: 6th: 1st: rotary blower vs. 1st engine vs. 1st

super charging 2 cycle engines

१५०२: ६०२ of mechanical blower up: १८ Turbo charger
 १५०३: ६०३ Blower up. १५०४: ६०४ Turbo charger up: १८

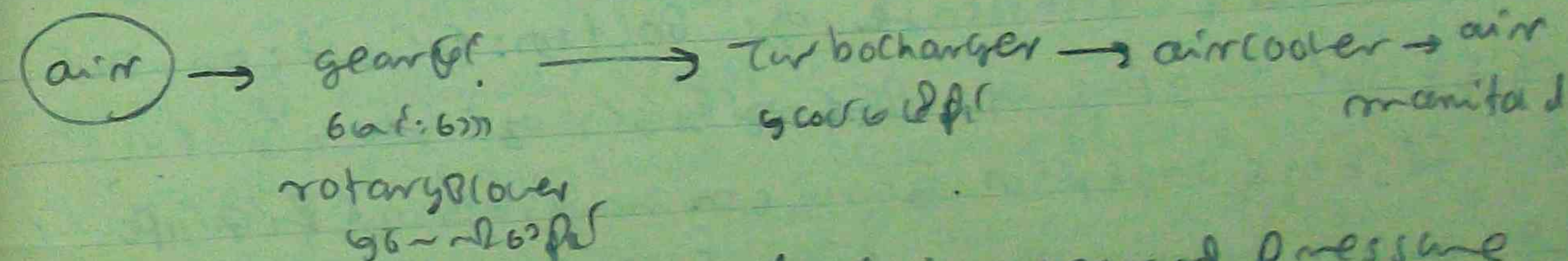


Reciprocating Blower 2500 Blap

gear driven centrifugal blower only 2750 RPM

Serial Turbocharging 3500 BHP

[Turbo charger + gear driven centrifugal Blower]



95-263P

* Rotary Blowers). engine ~~dr~~ drive gear of pressure sensitive clutch ring rotor. sc. clutch discharge pump rotary blower. 200 ft. run 6-10:00. Turbocharge sc. 5 check valve of gear 50. of m 2 m or of 10 ft. m 10 ft. is m 10 ft. 60 ft. 10 ft. Rotary blower of 60 ft. 10 ft. engine power 60 ft. 60 ft.

Engine Liners
(cooling & lubricating)

Linear use of ① very linear ② wet linear ③ Integral water jacketed linear use of ④ ⑤ ⑥ ⑦ ⑧ ⑨ 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

[illegible]

A hand-drawn diagram of a three-car train. The middle car is labeled "Dry" above it. The two end cars are labeled "Wet" above them.

655: (156)11 diesel up-oz: line up: of 2, 2

liner material
 6000 psi diesel engine liner up: of 2, 2
 6000 psi cylinder block m: cast Iron Alloy (G)
 200 Brinell (cast) 5000 psi
 Engine m: 1000 psi 6000 psi
 cylinder wall up: of m: 0.001"
 liner up: m: cast Iron
 alloy (G) 6000 psi
 Nickel, chromium, molybdenum
 Titanium 6000 psi
 liner up: m: centrifugal
 High Speed Diesel Engine up: 6000 psi
 Induction Hardened 5000 psi
 Dry liner up: of 47 Rockwell (470 Brinell) of 50
 57 Rockwell (640 Brinell) 7000 psi
 wet liner up: of 41 Rock
 well (400 Brinell) 53 Rwc (5508) 2000 psi
 engine 7000 psi 6000 psi 6000 psi

2. Eff. liner for 7.5 mm gap \Rightarrow Pariser Pariser
lubrication coating (eff.) chemical etching \Rightarrow eff.
on eff. liner you find it at 60°C or 60°.

[illegible]

0.005 to 0.010" liner wear: on 7200 20: 5" 6" 200
8 on aluminium alloy liner on 7200 20: 1/30" 200
Hard Transition molybdenum plating on 7200 20: 1/30" 200
Transition 500 to 600 Brinell 200 on 7200 20: 1/30" 200
up: of Housing & 7200 20: 1/30" 200
of porous surface of 7200 20: 1/30" 200
Air cool Diesel & Petrol engine up: of Die cast
Aluminium cylinder: 7200 20: 1/30" 200
0.005 to 0.010" 7200 20: 1/30" 200

Dry v_s wet liner

[illegible]

met liner op of walleg. of een liner door 2 u
 op 1/2' over 1/2' op 1/2' 60 1/2' 2 u (water tight joint) 2 u op 1/2'
 60 1/2' over liner 2 u op 1/2' 1/2' flange 2 u op 1/2' 60 1/2' 2 u
 2 u op 1/2' 60 1/2' over liner 2 u op 1/2' 1/2' 1/2' 60 1/2' 2 u

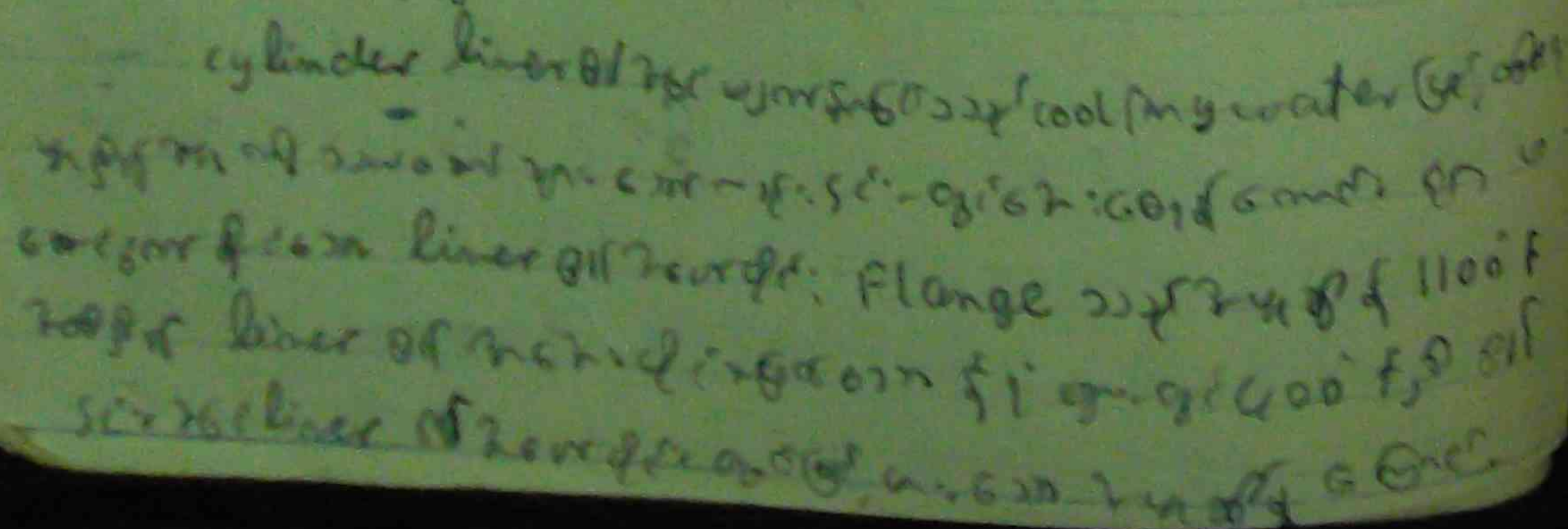
Liner seats

6. ~~Remove~~ 2 of engine up: of "10" Ring up: of up: 2 up: 10
 7. 2 of cyl. Head of block of Bolt up: of up: 2 up: 10
 8. Head of liner of 2 of up: 10 of up: 2 up: 10
 9. 2 of liner block of 2 of up: 10 of up: 2 up: 10

[illegible]

Integral water Jacket liner

5. 1. 1. liner up: 2. water jacket 3. 4. 5. 6. 7. 8. 9. 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. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838



Piston Rings & its functions are as follows:
1) To seal the combustion chamber from the crankcase.
2) To scrape excess oil from the cylinder wall.
3) To transfer heat from the cylinder wall to the cooling water.
4) To provide a backup for the main bearing.

Liner wear

[illegible]

Removing liner

screw type puller or puller m. liner or a rod

[Handwritten notes:]

6-2: 0.9. 2. 4. 8. 16. 32. 64. 128. 256. 512. 1024. 2048. 4096. 8192. 16384. 32768. 65536. 131072. 262144. 524288. 1048576. 2097152. 4194304. 8388608. 16777216. 33554432. 67108864. 134217728. 268435456. 536870912. 1073741824. 2147483648. 4294967296. 8589934592. 17179869184. 34359738368. 68719476736. 137438953472. 274877906944. 549755813888. 1099511627776. 2199023255552. 4398046511104. 8796093022208. 17592186044416. 35184372088832. 70368744177664. 140737488355328. 281474976710656. 562949953421312. 1125899906842624. 2251799813685248. 4503599627370496. 9007199254740992. 18014398509481984. 36028797018963968. 72057594037927936. 144115188075855872. 288230376151711744. 576460752303423488. 1152921504606846976. 2305843009213693952. 4611686018427387904. 9223372036854775808. 18446744073709551616. 36893488147419103232. 73786976294838206464. 147573952589676412928. 295147905179352825856. 590295810358705651712. 1180591620717411303424. 2361183241434822606848. 4722366482869645213696. 9444732965739290427392. 18889465931478580854784. 37778931862957161709568. 75557863725914323419136. 151115727451828646838272. 302231454903657293676544. 604462909807314587353088. 1208925819614629174706176. 2417851639229258349412352. 4835703278458516698824704. 9671406556917033397649408. 19342813113834066795298816. 38685626227668133590597632. 77371252455336267181195264. 154742504910672534362390528. 309485009821345068724781056. 618970019642690137449562112. 1237940039285380274899124224. 2475880078570760549798248448. 4951760157141521099596496896. 9903520314283042199192993792. 19807040628566084398385987584. 39614081257132168796771975168. 79228162514264337593543950336. 158456325028528675187087900672. 316912650057057350374175801344. 633825300114114700748351602688. 1267650600228229401496703205376. 2535301200456458802993406410752. 5070602400912917605986812821504. 10141204801825835211973625643008. 20282409603651670423947251286016. 40564819207303340847894502572032. 81129638414606681695789005144064. 162259276829213363391578010288128. 324518553658426726783156020576256. 649037107316853453566312041152512. 1298074214633706907132624082305024. 2596148429267413814265248164610048. 5192296858534827628530496329220096. 10384593717069655257060992658440192. 20769187434139310514121985316880384. 41538374868278621028243970633760768. 83076749736557242056487941267521536. 166153499473114484112975882535043072. 332306998946228968225951765070086144. 664613997892457936451903530140172288. 1329227995784915872903807060280344576. 2658455991569831745807614120560689152. 5316911983139663491615228241121378304. 10633823966279326983230456482242756608. 21267647932558653966460912964485513216. 42535295865117307932921825928971026432. 85070591730234615865843651857942052864. 170141183460469231731687303715884105728. 340282366920938463463374607431768211456. 680564733841876926926749214863536422912. 1361129467683753853853498429727072845824. 2722258935367507707706996859454145691648. 5444517870735015415413993718908291383296. 10889035741470030830827987437816582766592. 21778071482940061661655974875633165533184. 43556142965880123323311949751266331066368. 87112285931760246646623899502532662132736. 174224571863520493293247799005065324265472. 348449143727040986586495598010130648530944. 696898287454081973172991196020261297061888. 1393796574908163946345982392040522594123776. 2787593149816327892691964784081045188247552. 5575186299632655785383929568162090376495104. 11150372599265311570767859136324180752990208. 22300745198530623141535718272648361505980416. 44601490397061246283071436545296723011960832. 89202980794122492566142873090593446023921664. 178405961588244985132285746181186892047843328. 356811923176489970264571492362373784095686656. 713623846352979940529142984724747568191373312. 1427247692705959881058285969449495136382746624. 2854495385411919762116571938898990272765493248. 5708990770823839524233143877797980545530986496. 11417981541647679048466287755595961091061972992. 22835963083295358096932575511191922182123945984. 45671926166590716193865151022383844364247891968. 9134385233318143238773030204476768872849578

page 2501

scuffed and scored liners

[illegible]

1. 2. 3. 4. 5. 6. 7. 8. 9. 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. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840.

6. 1. Piston liner clearance 0.1 mm
 2. Piston ring groove ^{suffering} wear
 3. Reconditioning liners

① wear on cylinder: liner and rings - wear on piston
② liner rings: wear on rings: oil - oil on liner and
oil on ridge of ridge cutter (oil) of liner and Herringbone
oversize piston ring of oil on oil (oil) on liner
oil on liner: oil on oil (oil) on oil: oversize bearing
oil on oversize piston. Liner: wear on oil on oil on oil

cleaning of bearings and pistons by hand or by machine
 engine parts should be cleaned by hand or by machine
 engine parts should be cleaned by hand or by machine
 engine parts should be cleaned by hand or by machine
 engine parts should be cleaned by hand or by machine
 engine parts should be cleaned by hand or by machine

Part 9

Engine Maintenance

① Periodic inspection maintenance ② Preventive maintenance
 ① Periodic inspection maintenance
 engine should be inspected at intervals of 1000 miles or 100 hours
 engine should be inspected at intervals of 1000 miles or 100 hours
 engine should be inspected at intervals of 1000 miles or 100 hours
 engine should be inspected at intervals of 1000 miles or 100 hours
 engine should be inspected at intervals of 1000 miles or 100 hours
 engine should be inspected at intervals of 1000 miles or 100 hours

Preventive maintenance Program

① Engine oil: over haul 1000 miles or 100 hours
 ② Engine oil: 1000 miles or 100 hours
 ③ Engine oil: 1000 miles or 100 hours
 ④ Engine oil: 1000 miles or 100 hours
 ⑤ Engine oil: 1000 miles or 100 hours
 ⑥ Engine oil: 1000 miles or 100 hours
 ⑦ Engine oil: 1000 miles or 100 hours
 ⑧ Engine oil: 1000 miles or 100 hours
 ⑨ Engine oil: 1000 miles or 100 hours
 ⑩ Engine oil: 1000 miles or 100 hours
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lumber catalog (online)

$$\frac{\text{Engine CHP} \times \text{Time (hr)}}{\text{Lub oil gallon}} = \text{Lub oil consumption (Forcast: 1800)}$$

Crack Gas Pressure Curve

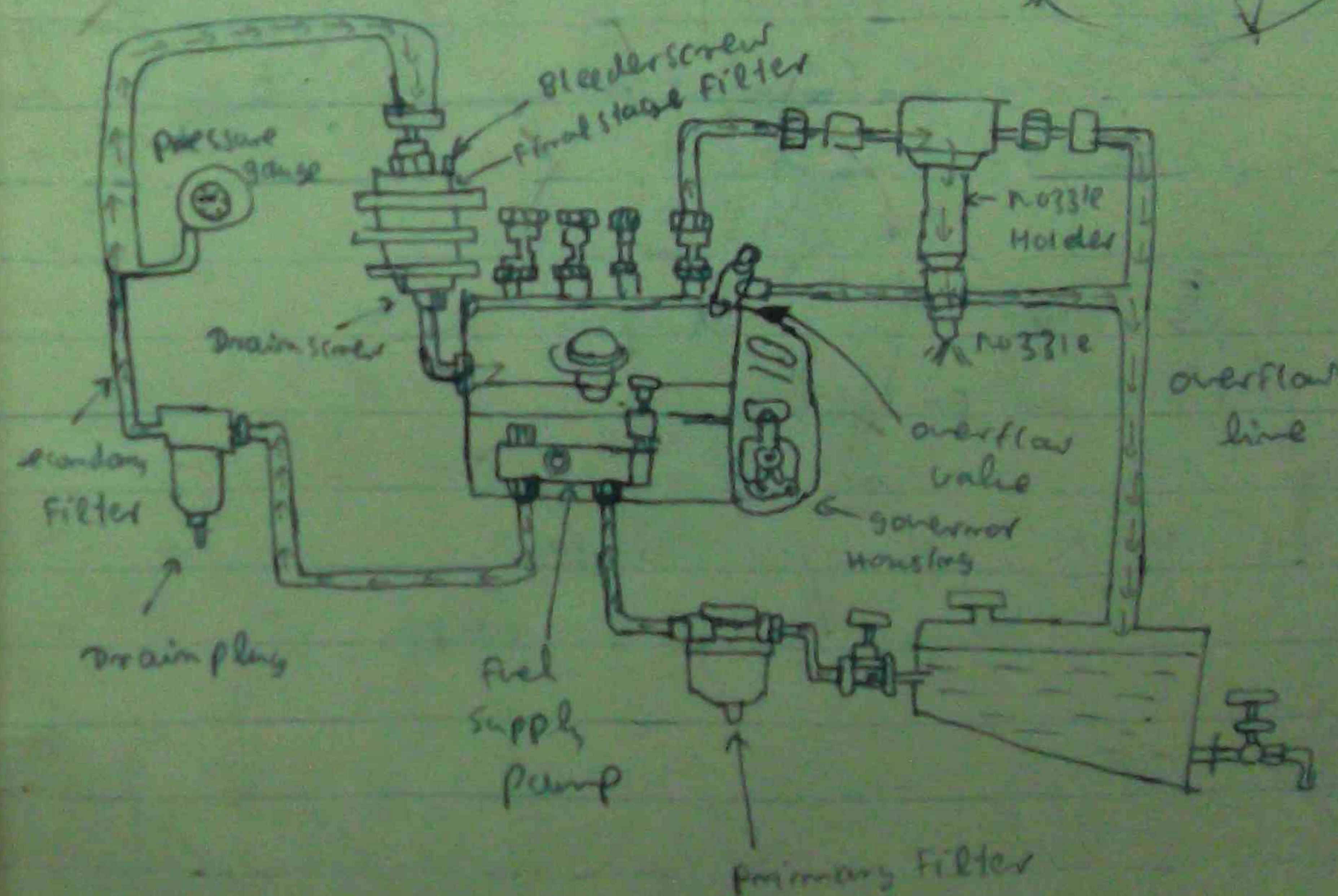
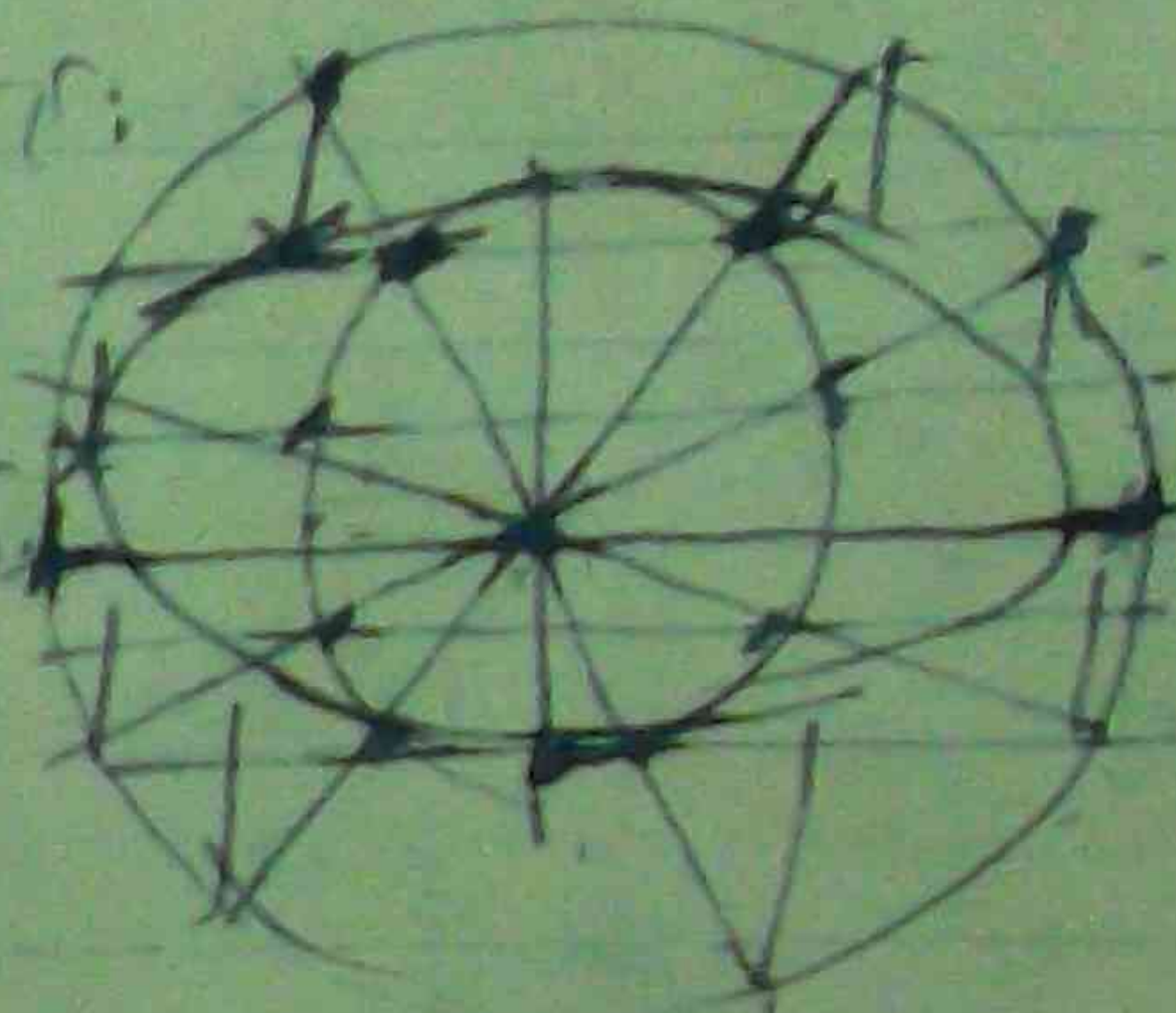
Fuel oil consumption (concurve)

Pressure drop across the filter

crane dilution and more of it for a year.

exam timing 8. p.m.

Air system at 2700 rpm: 5, 6, 7, 8, 9, 10, 11 Piston
 5, 6, 7, 8, 9, 10, 11: engine alignment
 5, 6, 7, 8, 9, 10, 11: compression ratio: 1 fuel lub:
 oil consumption of: 1 mm @ 1, 1 crank case pressure
 1 mm @ 1: 1 cranking speed @ 1:
 of 10 mm over haul 1000 rpm
 1000 rpm P.m 2000: 6000 rpm



Cadet Nigam Naring e (11)

KN (118)

555/1

-- Nigam Naring --
- Theory of Engines and
Mechanical Engineering
Knowledge

120

Workshop Technology
Volume 2 Automotive
Technology



Autonomous Technology

- ① Power train
- ② Steering system
- ③ Braking system

② Power Train

English drive 6000 ft, 1 mile off, 1000 ft up, 1000 ft
and 1000 ft, 1000 ft, 1000 ft, 1000 ft, 1000 ft

- ③ cluster ④ open box (Transmission?)

Over the plot of sample 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, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845



shaft

Spur gear

Helical & spiral gear

Helical gear

Helical gear

Helical gear

Helical gear

Helical gear

Helical gear

Bevel gear

Bevel gear

Bevel gear

Bevel gear

Bevel gear

Bevel gear

Worm gear

Worm gear

Worm gear

Worm gear

Worm gear

Worm gear

Worm gear

Worm gear

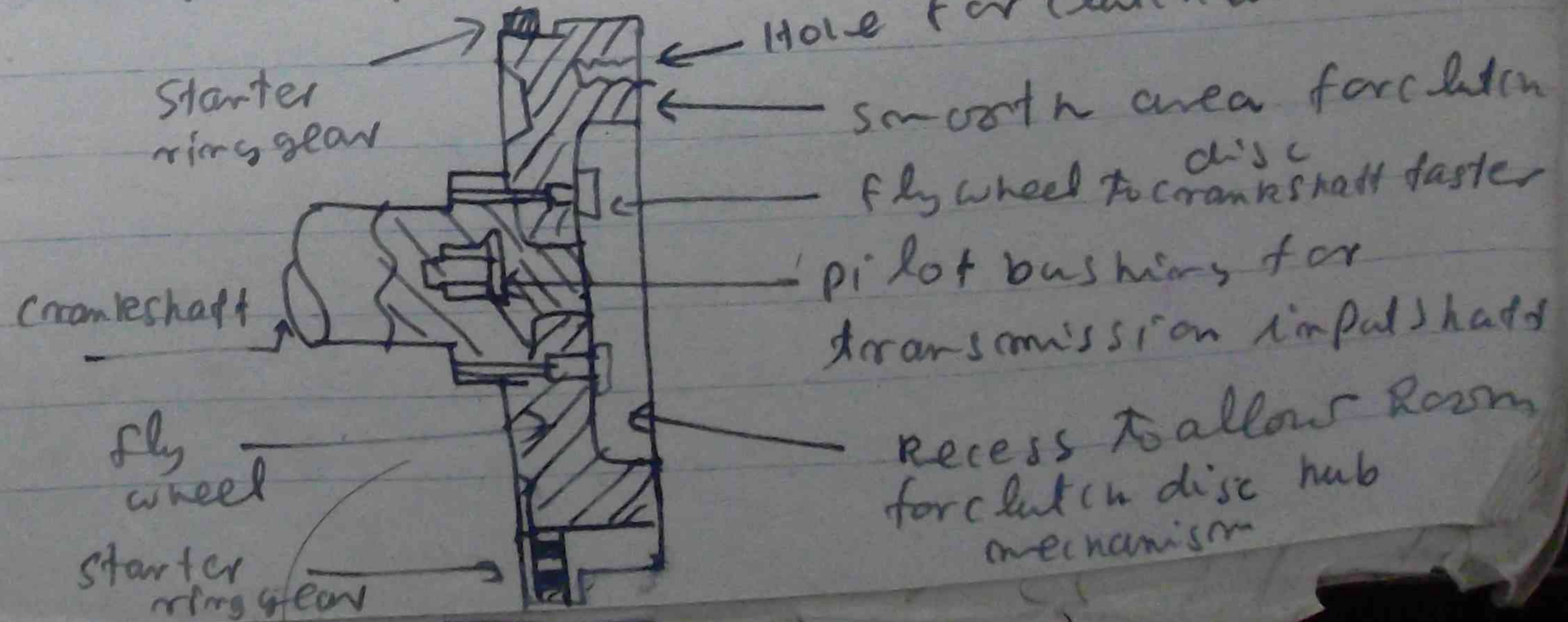
Worm gear

(A) clutch

(a) Purpose of clutches

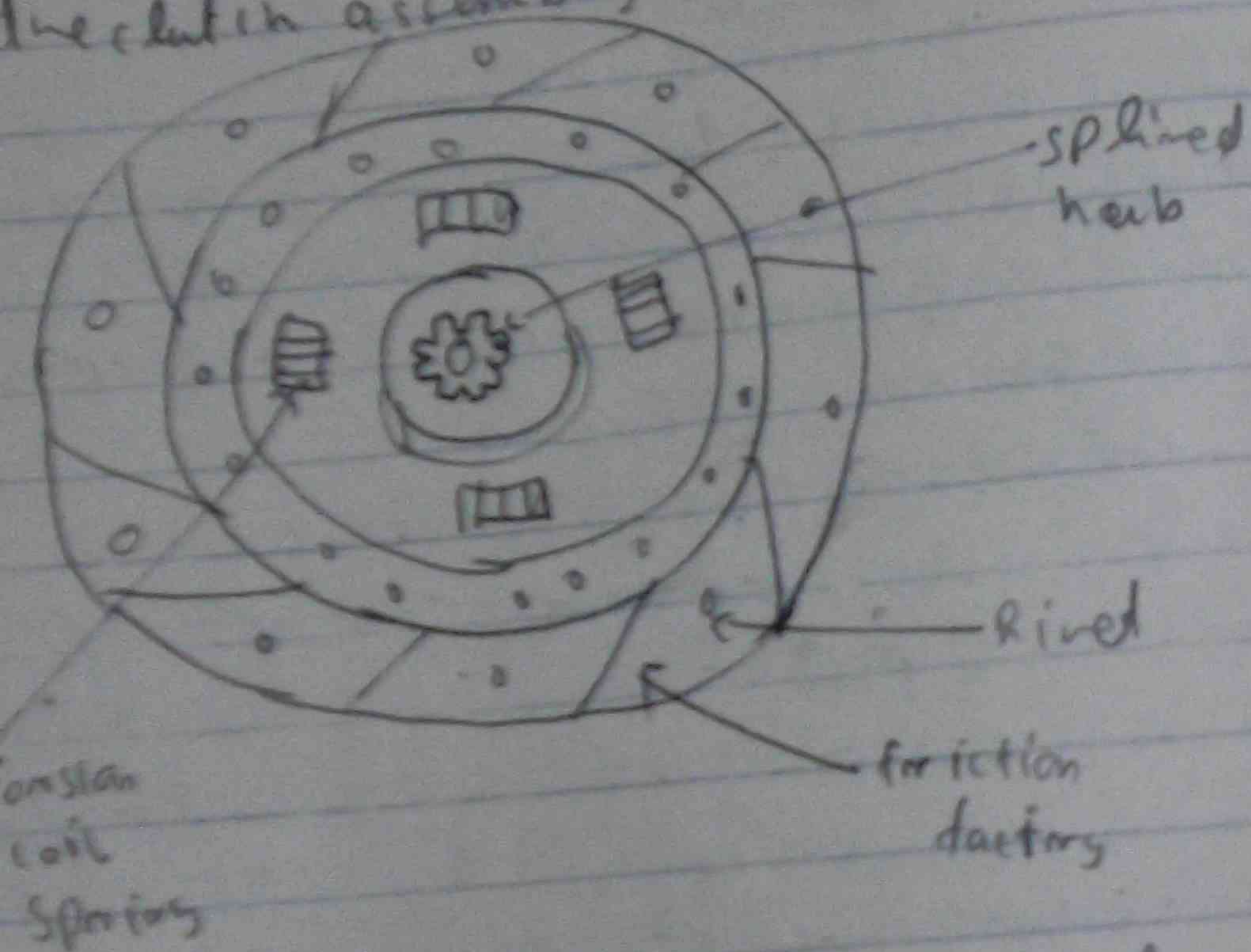
clutch of engine & transmission in gear box. clutch is used to engage or disengage the engine from the transmission. It is used to stop the engine from running when the vehicle is stopped. It is used to change gears without stopping the engine.

clutch of engine & transmission in gear box. clutch is used to engage or disengage the engine from the transmission. It is used to stop the engine from running when the vehicle is stopped. It is used to change gears without stopping the engine.



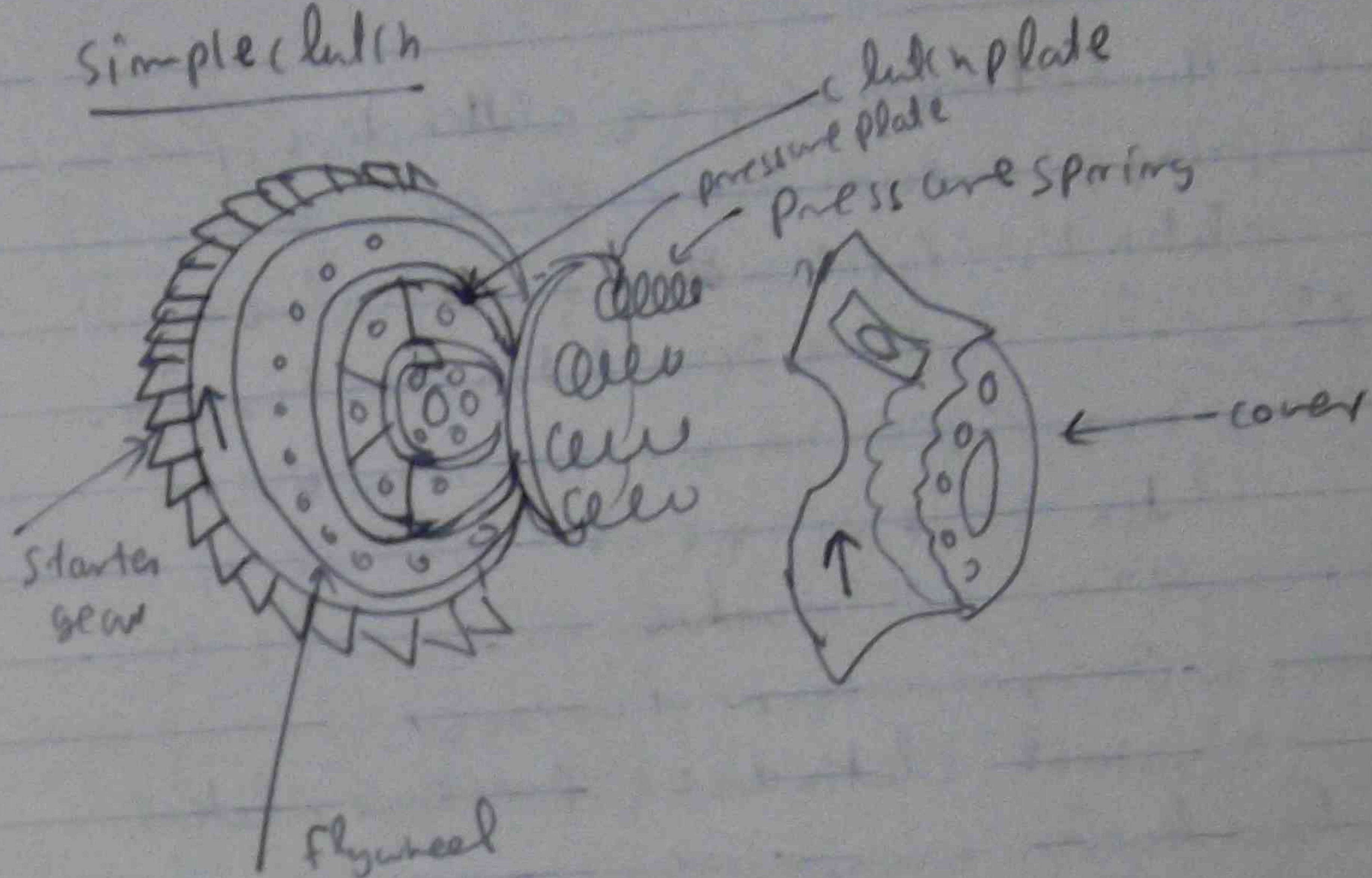
Cross sectional view of flywheel design

flywheel provides the foundation which the clutch assembly is built.



One type of clutch disc note splined hub and the arrangement of torsional coil springs that cushion shock of engagement.

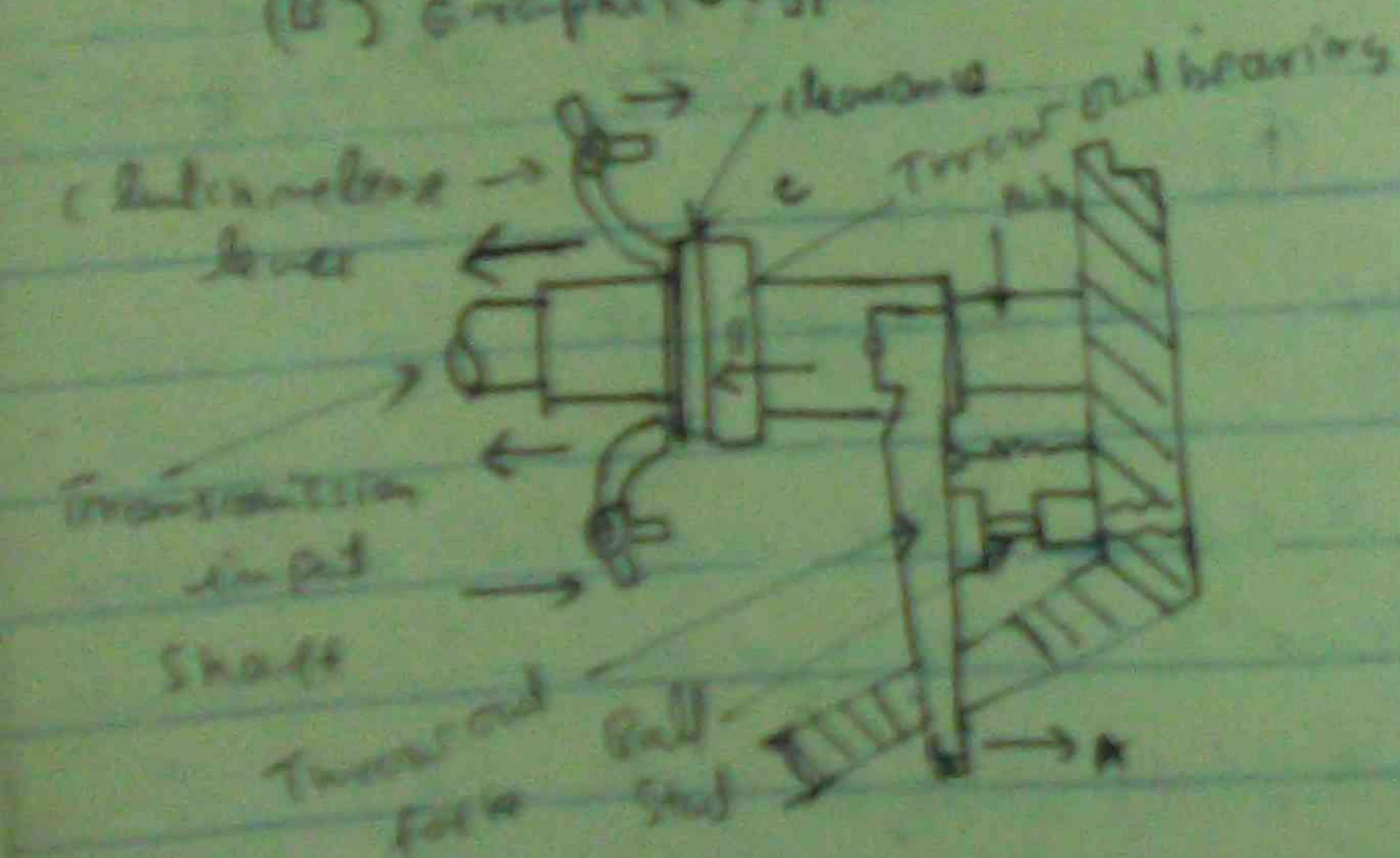
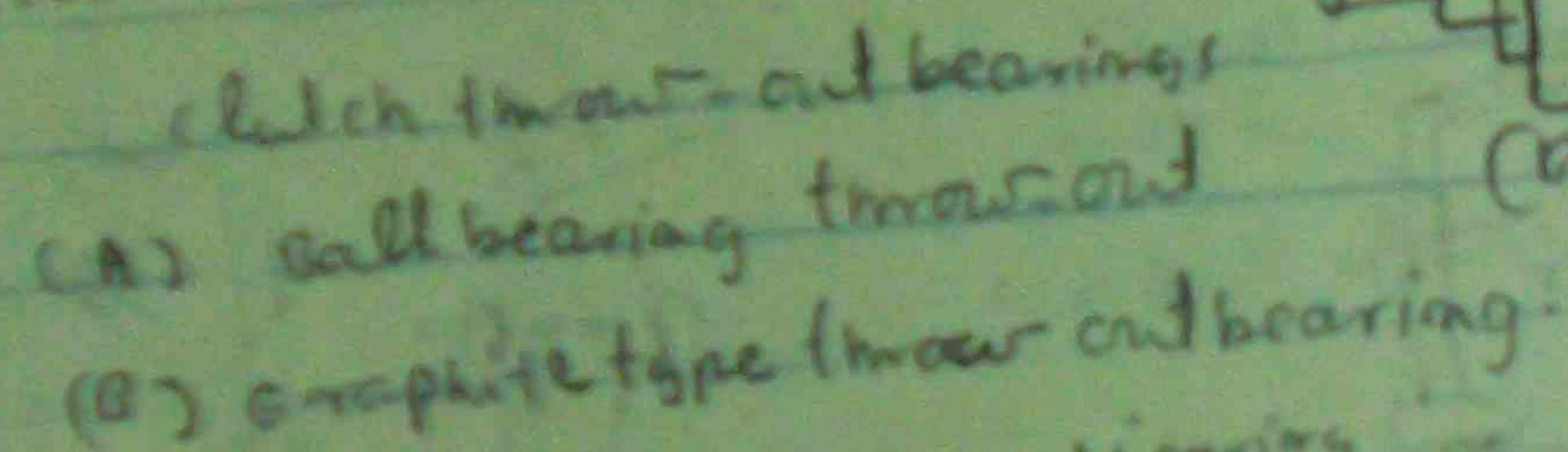
Simple clutch



Construction and operation

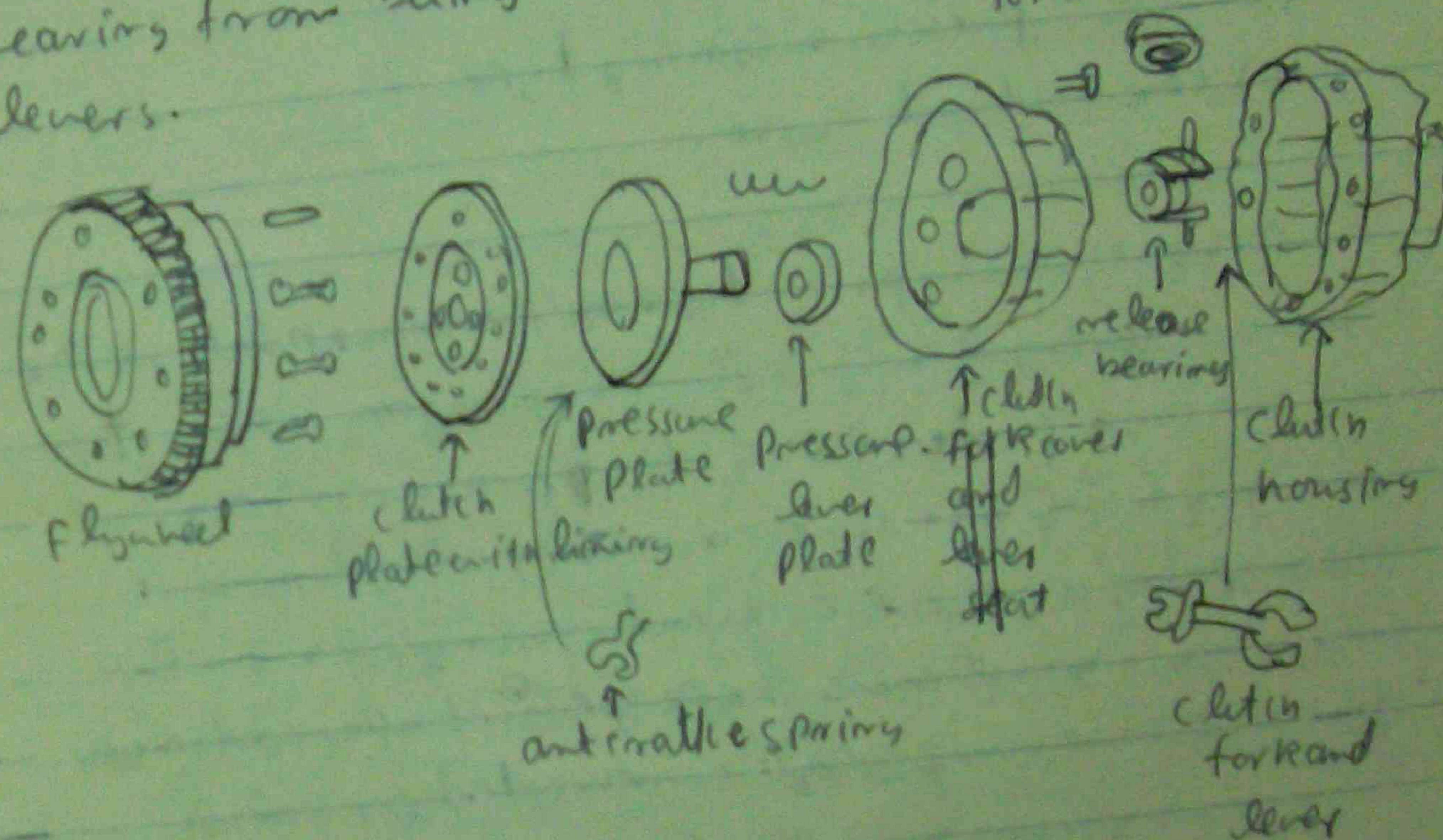
clutch assembly consists of flywheel, clutch disc, pressure plate, springs, pressure plate housing (or) clutch cover, lin. cages (release lever & fork).

clutch disc is connected to engine or flywheel. Pressure plate is connected to pressure plate housing (or) clutch cover of flywheel. Bolts are used to connect pressure plate of spring with flywheel. Pressure plate is connected to flywheel of 60 mm or 65 mm.



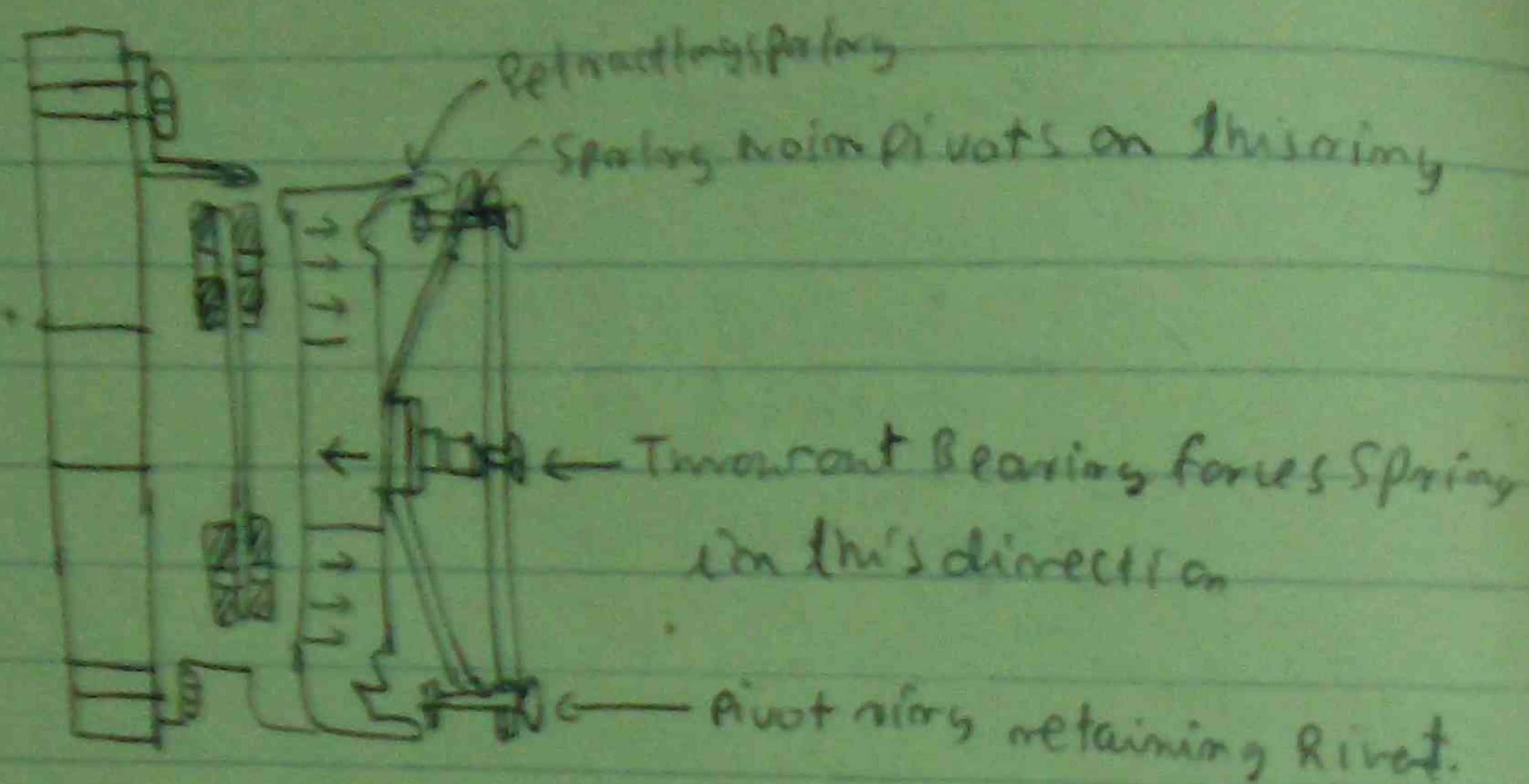
clutch throw out assembly. When clutch throw out fork is moved in direction A, the internal bearing is moved in direction B. When throw out contact release lever is moved, it will not reset pressure plate.

when clutch throw out fork is fully released,
there must be clearance to prevent
bearing from being turned constantly by whirling
levers.

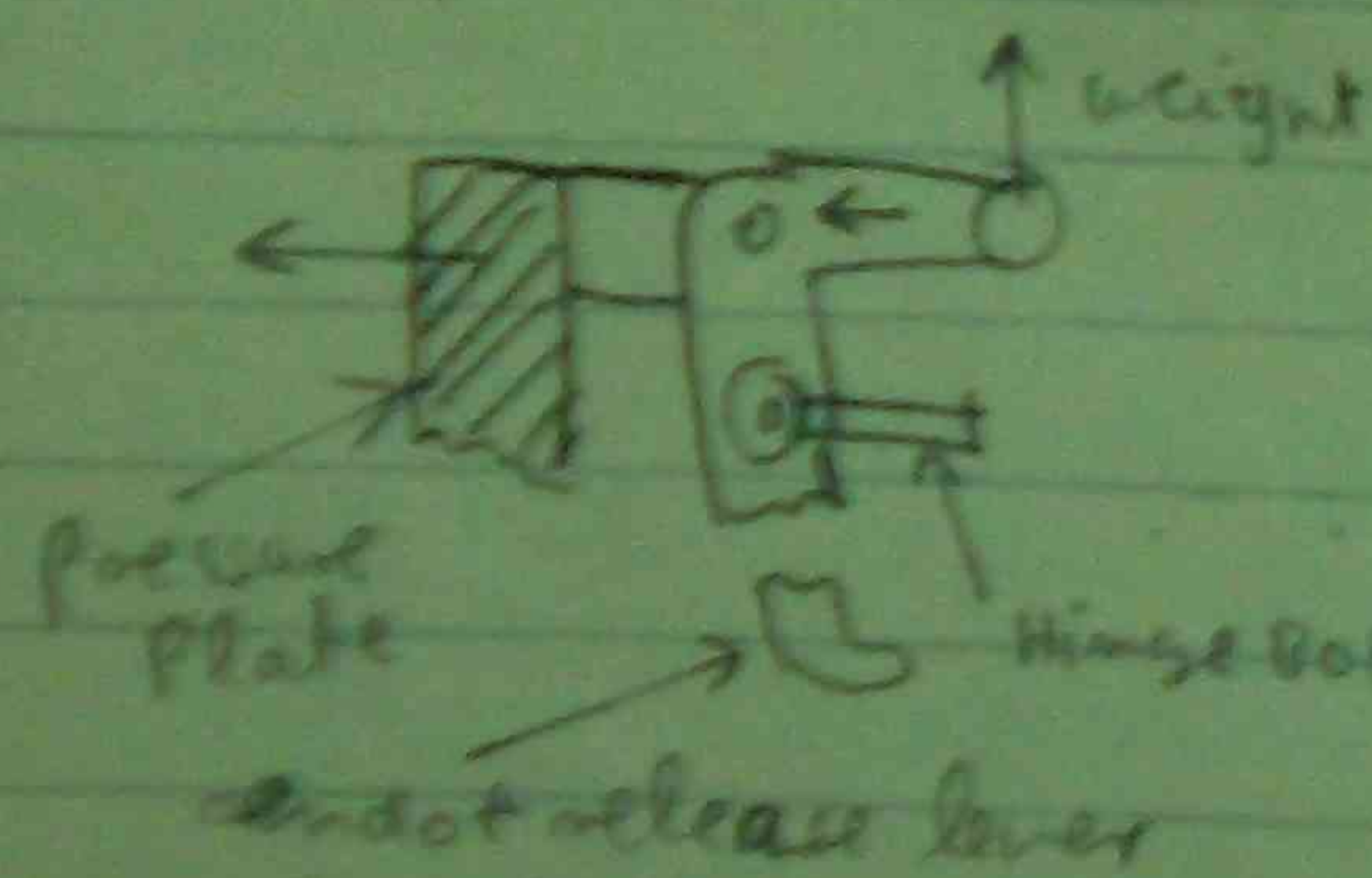


Types of clutches

clutch up : ଯେତେବେଳେ କ୍ଲଚ୍ ଡିଜାଇନ୍ ମାଡ଼ ନୁହେଁ : ସ୍ପରିଙ୍ଗ
ନୁହେଁ : ଏହି ସମୟରେ ଗ୍ୟାସ୍ ପ୍ରଦାନ ହୁଏ । ଅର୍ଥାତ୍ ଗ୍ୟାସ୍ ଥିବା ବେଳେ କ୍ଲଚ୍
ଉପରକୁ ଟାଣି ଦିଆଯାଏ । ଏହା ଫଳରେ ଗ୍ୟାସ୍ ଆମେସନ୍ ସ୍ପରିଙ୍ଗ



Via pinion spring clutch in disengaged position throw out bearing has bent clutch diaphragm fingers inward. This pulls outer edge back thus retracting pressure plate and leaving clutch disengage.



weight added to
at different type release
lever when clutch
revolves, weight is
thrown outward thus
adding to spring pressure
certainly a type lever.

clutch adjustment

8. 8: clutch up: 20" adjustment 2 2/3 lbs 22 1/2"

5. 9. 4 (1) Floor board clearance adjustment
(2) Free play adjustment
(3) clutch release lever adjustment of GTO

[illegible]

- (1) Floor Board clearance adjustment

୫୫: adjustment of clutch pedal ୫୫mm of ୫୫ screw
 ୫୫mm of ୫୫mm Floor Board of ୫୫mm
 clutch pedal of ୫୫: ୫୫. ୫୫mm of ୫୫mm of ୫୫mm
 ୫୫mm of ୫୫mm adjusting screw of ୫୫mm: ୫୫mm of ୫୫mm of ୫୫mm
 ୫୫mm of ୫୫mm of ୫୫mm: ୫୫mm of ୫୫mm of ୫୫mm
 clutch pedal rod of ୫୫mm of ୫୫mm of ୫୫mm: ୫୫mm of ୫୫mm of ୫୫mm
 ୫୫mm of ୫୫mm

gear 646271 torque up: 912271 7-31 2271 84 of. 46271
gear change 60: 20271

construction and operation of Simple three speed transmission

Typical Transmission of 63mm dia. of 6063 gear
20271: 20271 6063 11 (1) cast Iron or
aluminium housing (2) four shafts (3) bearing
(4) gear (5) synchronizing device 51. (6) shifting
mechanism of 11 11

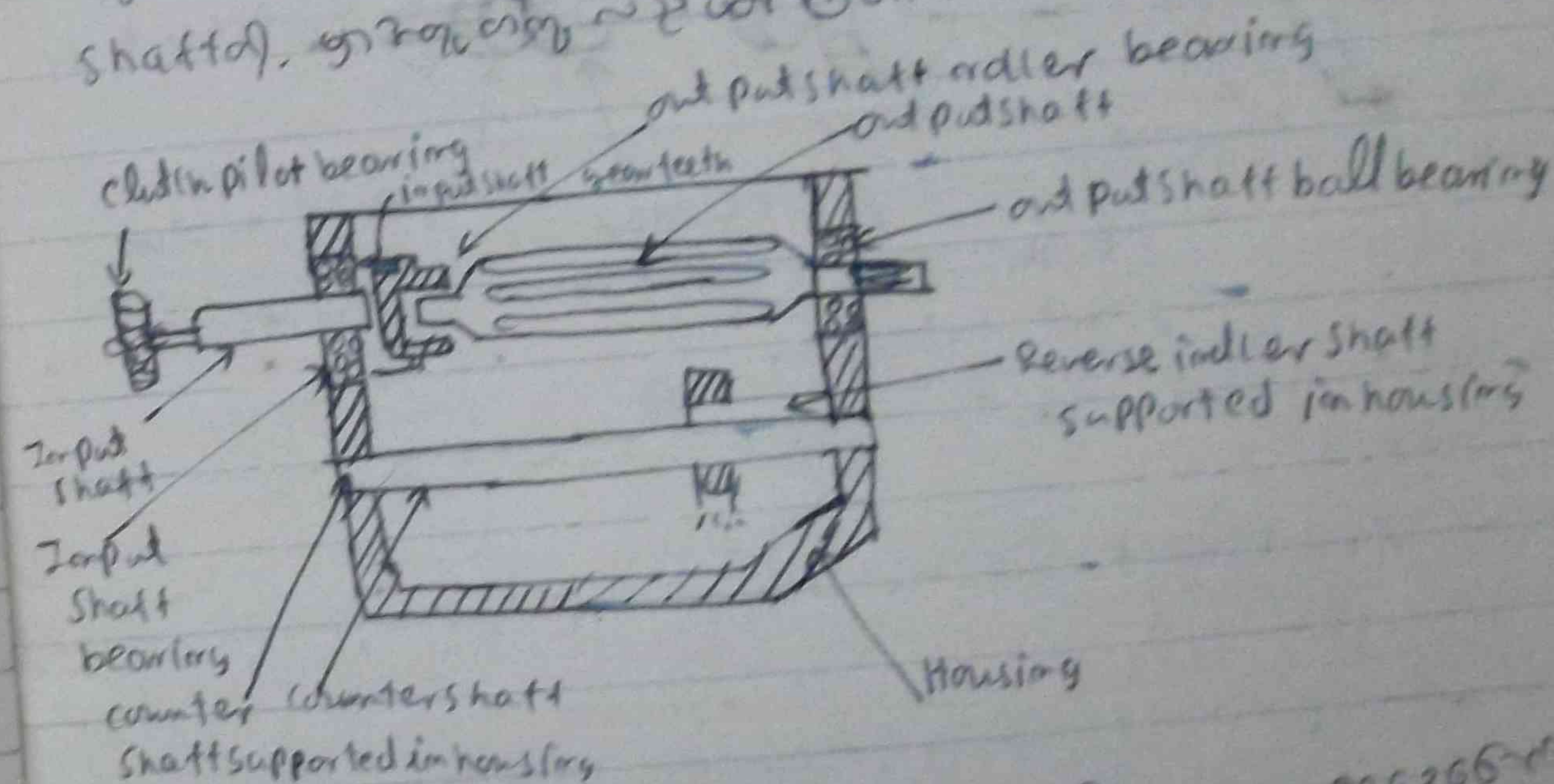
51: 20271 6063 11 20271 6063 11 20271
— countershaft gear (1) driven gear (2) second speed
gear (3) first speed gear (4) reverse gear 4063
gear 51: 20271 6063 11 20271 6063 11

— driven gear 20271 clutch shaft gear 1. 20271 6063 11
20271 clutch shaft 20271 6063 11 countershaft gear
gear 20271 20271 counter act 20271 6063 11 20271 6063 11

— 51 counter shaft of reverse gear 6063 11 reverse
idler gear 20271 6063 11 20271 6063 11 shaft 20271
20271 6063 11

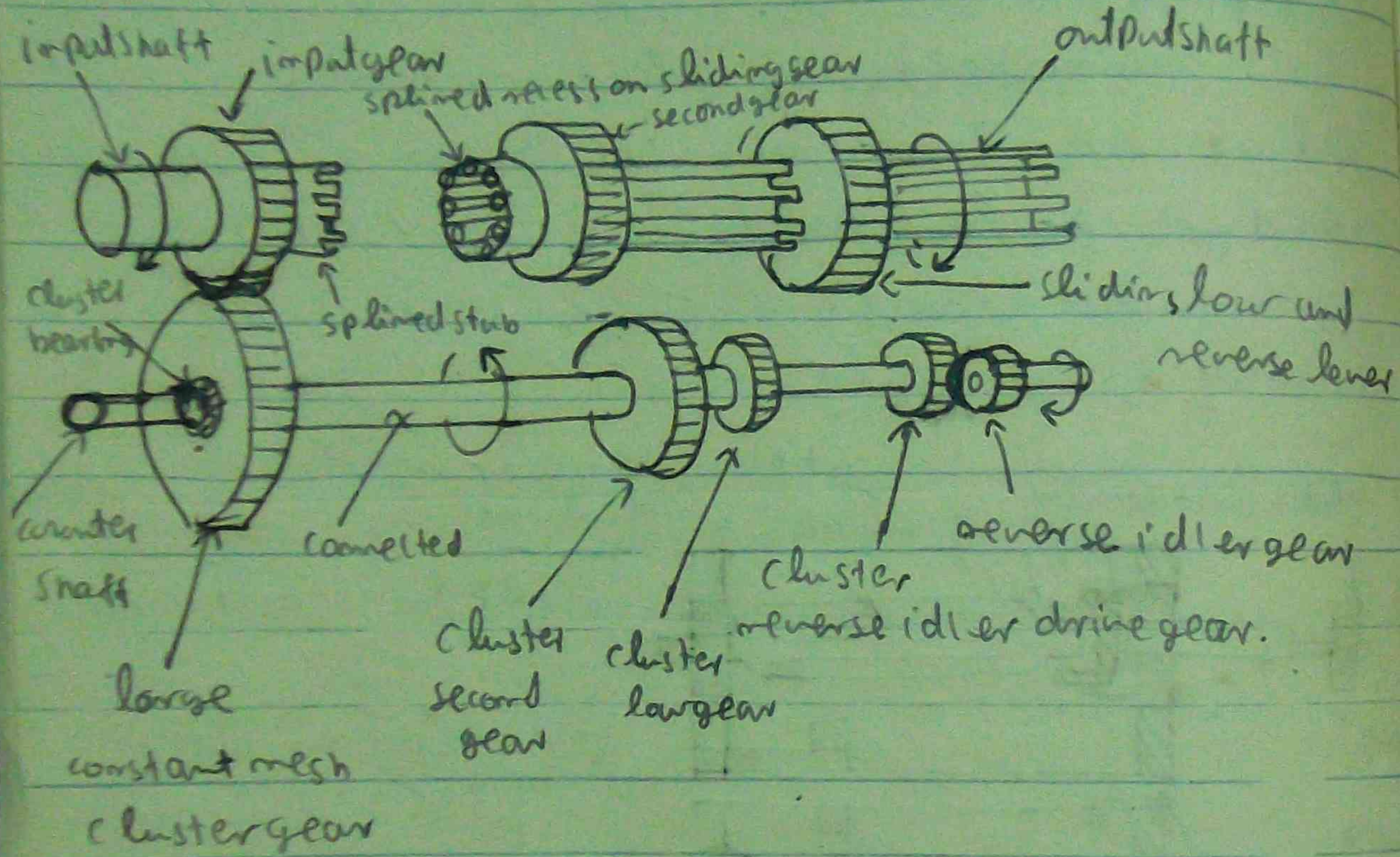
— main shaft 20271 6063 11 final drive 20271

2. 24 propeller shaft 51. 20271 6063 11
— 51: main shaft 6063 11 spline 6063 11 6063 11
spline 6063 11 20271 6063 11 20271 6063 11 20271 6063 11
speed gear 51 low and reverse gear 4063 11
gear 51 20271 6063 11 51: gear 51 20271 6063 11
shaft 51 20271 6063 11 20271 6063 11



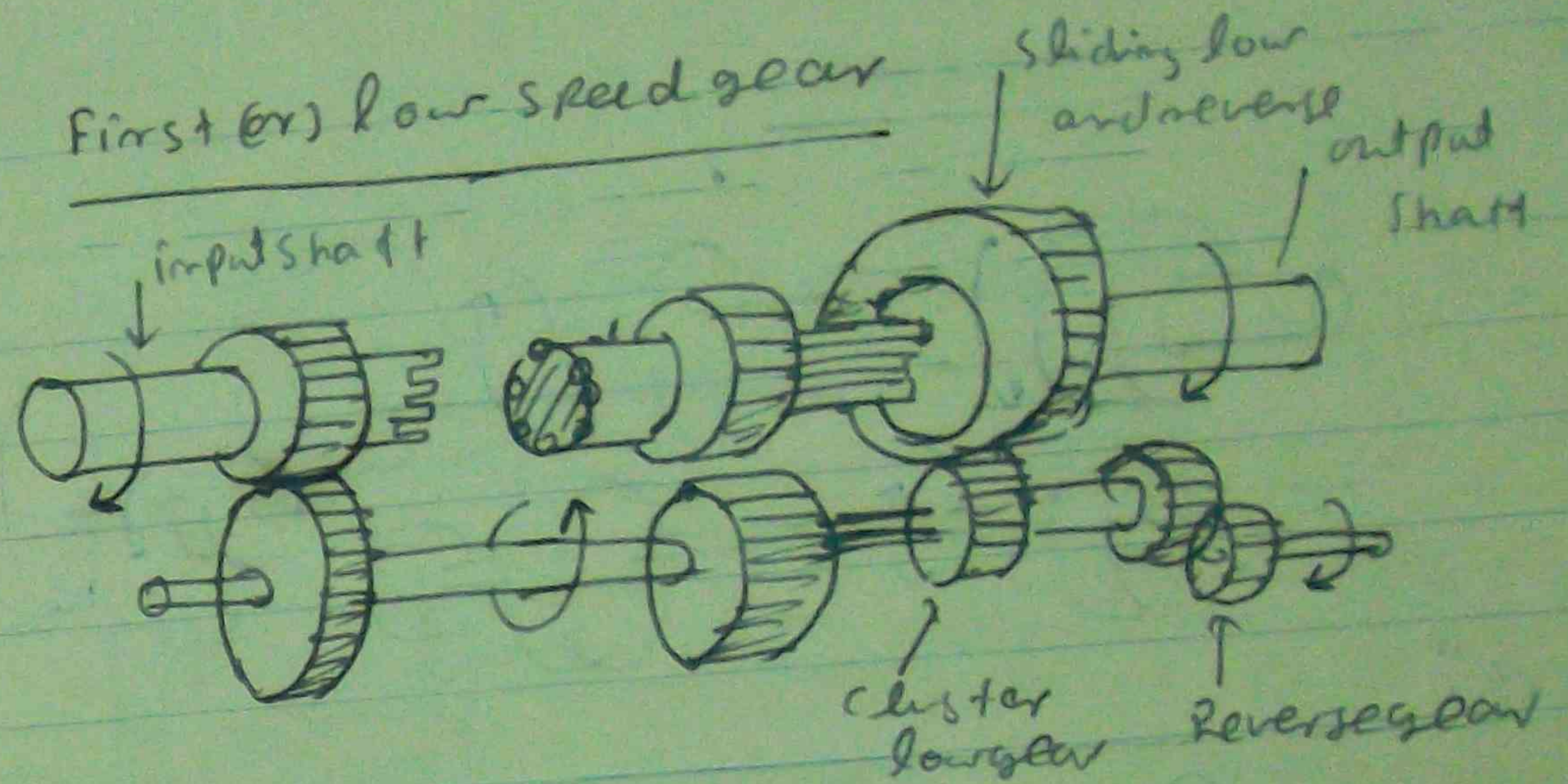
of 11: 20271 gear 20271 6063 11 20271 6063 11
20271 6063 11 floor type shift lever 20271 6063 11
20271 Transmission 20271 6063 11 Steering column shift
lever 20271 6063 11

① Transmission in Neutral

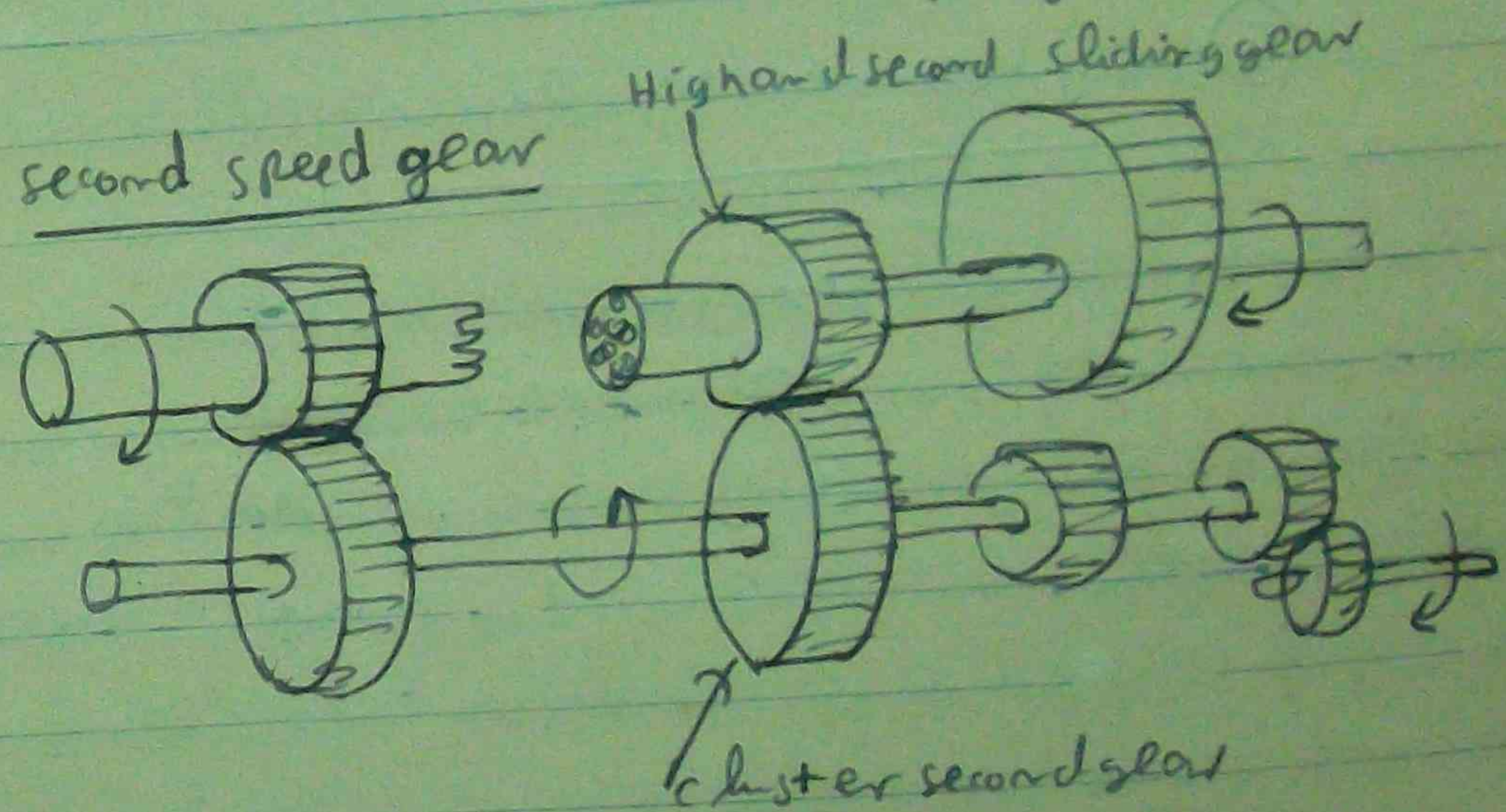


- Input shaft: 22T ~ 1st gear or input gear 1 22T ~ 2nd gear ~ 3rd gear
- Input shaft 22T ~ 4th gear connection ~ 22T ~ 5th gear: cluster gear 20T ~ 1st gear 20T: reverse gear ~ 1st gear ~ 2nd gear
- output shaft 22T ~ 1st ~ 2nd gear
- engine ~ 1st gear ~ 1st ~ 2nd gear ~ 3rd gear ~ 4th gear ~ 5th gear

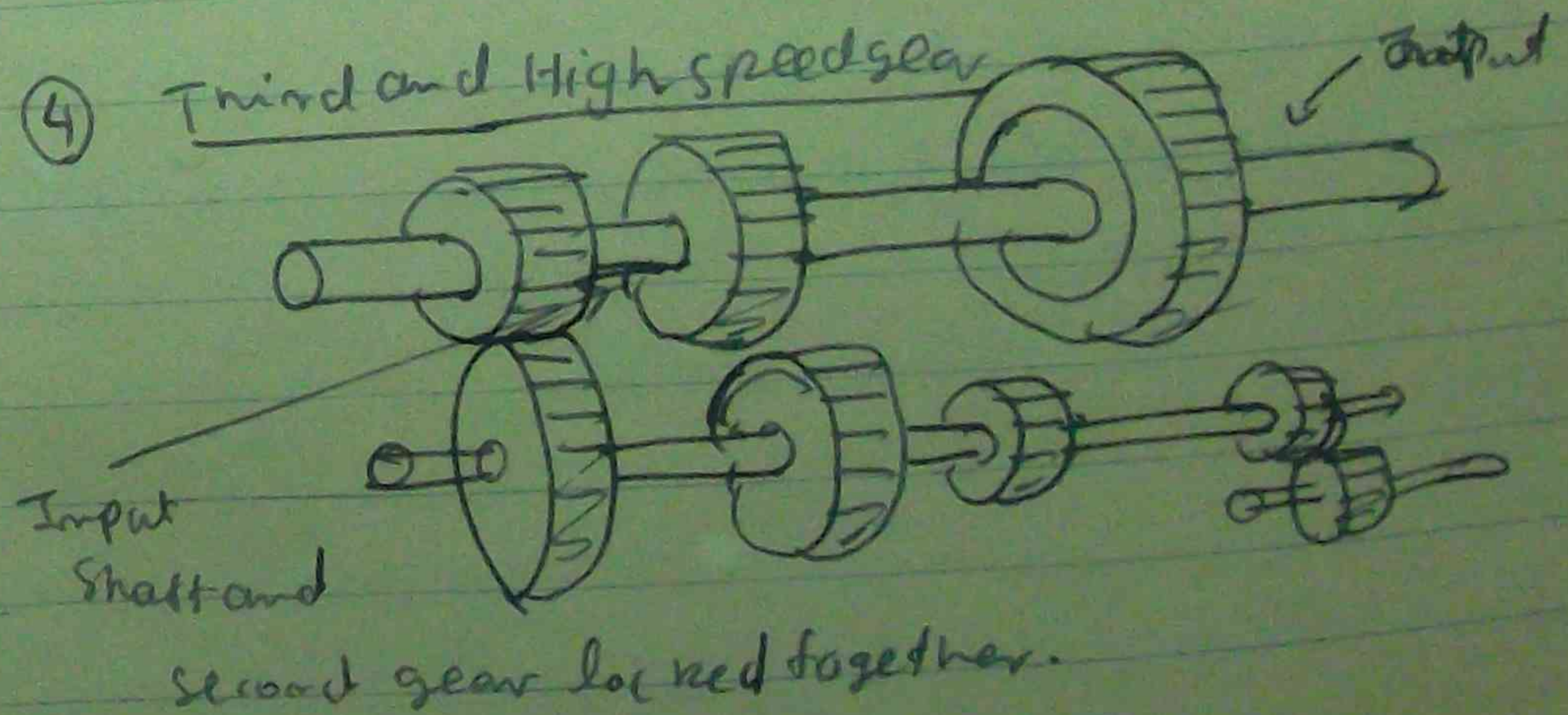
② First (or) low speed gear ↓ sliding low and reverse output



③ second speed gear



④ Third and High speed gear



Key gear of spring load ball of 100000

Shift lever key of 100000 sliding sleeve of

Drum assembly of speed of 100000 gear of 100000

of 100000 gear of 100000 synchronizing ring of 100000

of 100000 gear of 100000 shift lever of 100000

of 100000 gear of 100000 sliding sleeve of 100000

splines of 100000 speed of 100000 gear of 100000 external

spline of 100000 mesh of 100000 sliding sleeve of 100000

of 100000 gear of 100000 of 100000 of 100000

of 100000 gear of 100000 of 100000 of 100000

main shaft of 100000 spline of 100000 of 100000

of 100000 main shaft of 100000 of 100000 of 100000

of 100000 gear of 100000 of 100000 of 100000

sleeve of 100000 spring load ball of 100000 of 100000

of 100000 gear of 100000 of 100000 of 100000

Pim Type



Low and second speed

Low and second speed gear

Clutch gear

Inner stop ring

Clutch gear sleeve

Inner stop ring

gear gear through washer

Low and second speed gear

Speed gear

near thrust washer

of 100000 gear of 100000 of 100000 of 100000

Blocking ring of 100000 of 100000 of 100000 of 100000

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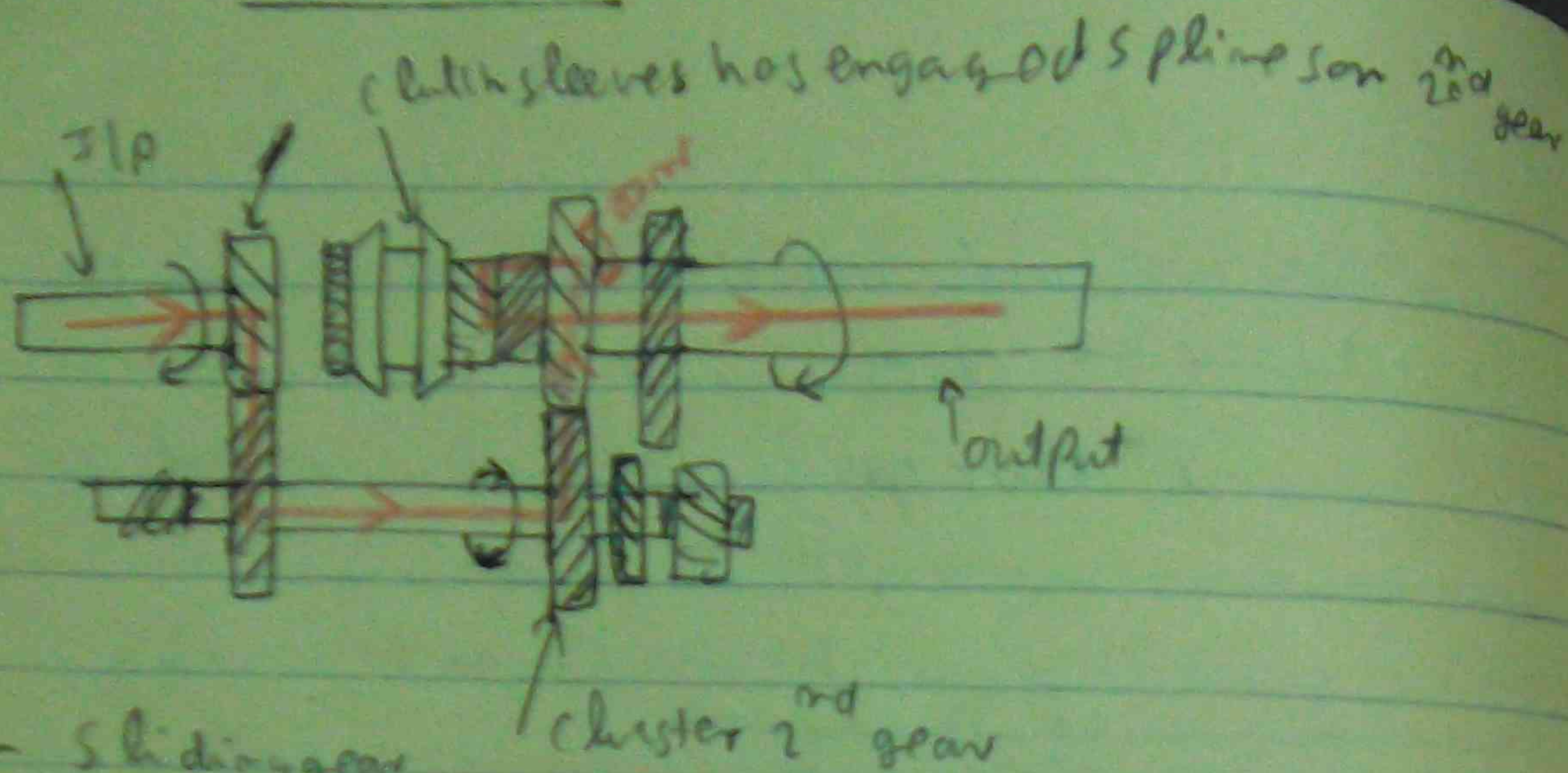
of 100000 gear of 100000 of 100000 of 100000

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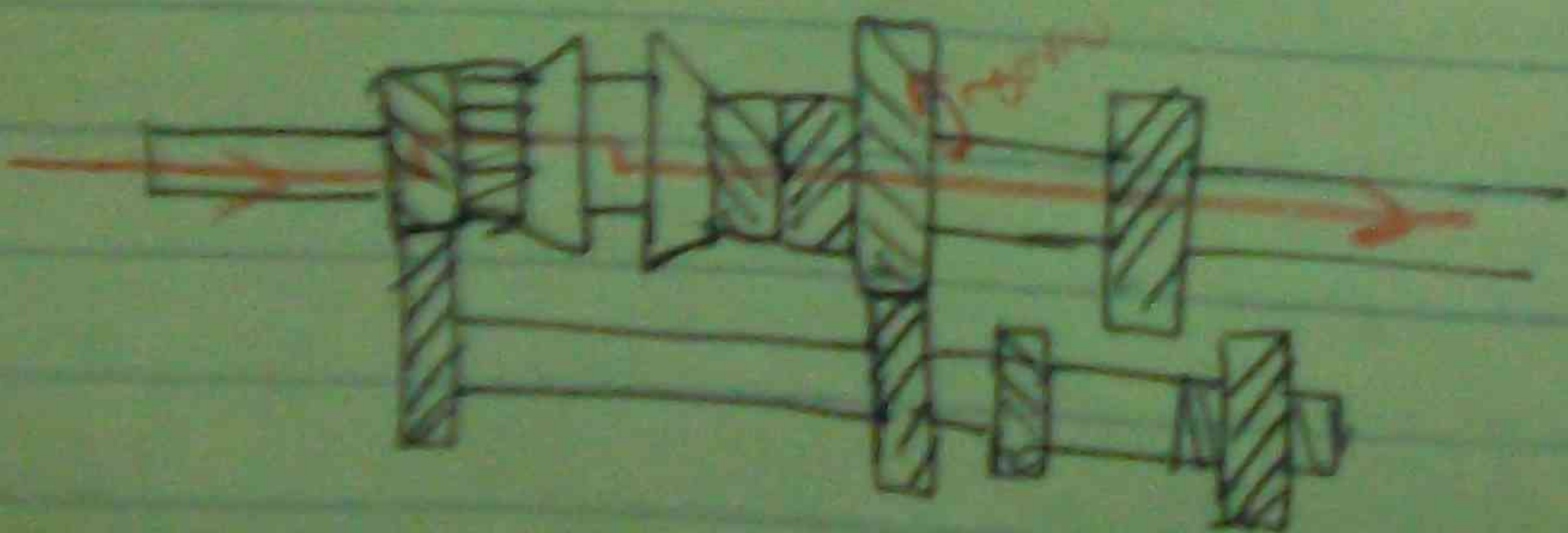
of 100000 gear of 100000 of 100000 of 100000

Second gear



- Sliding gear of gear 500/611
- Synchronizer (clutch sleeve of second gear) of 700/800 (engage) 600/500 of 600/500
- of 2nd sleeve of input shaft of clutch gear 2nd gear, 2nd gear of 600/500 output shaft of 600/500

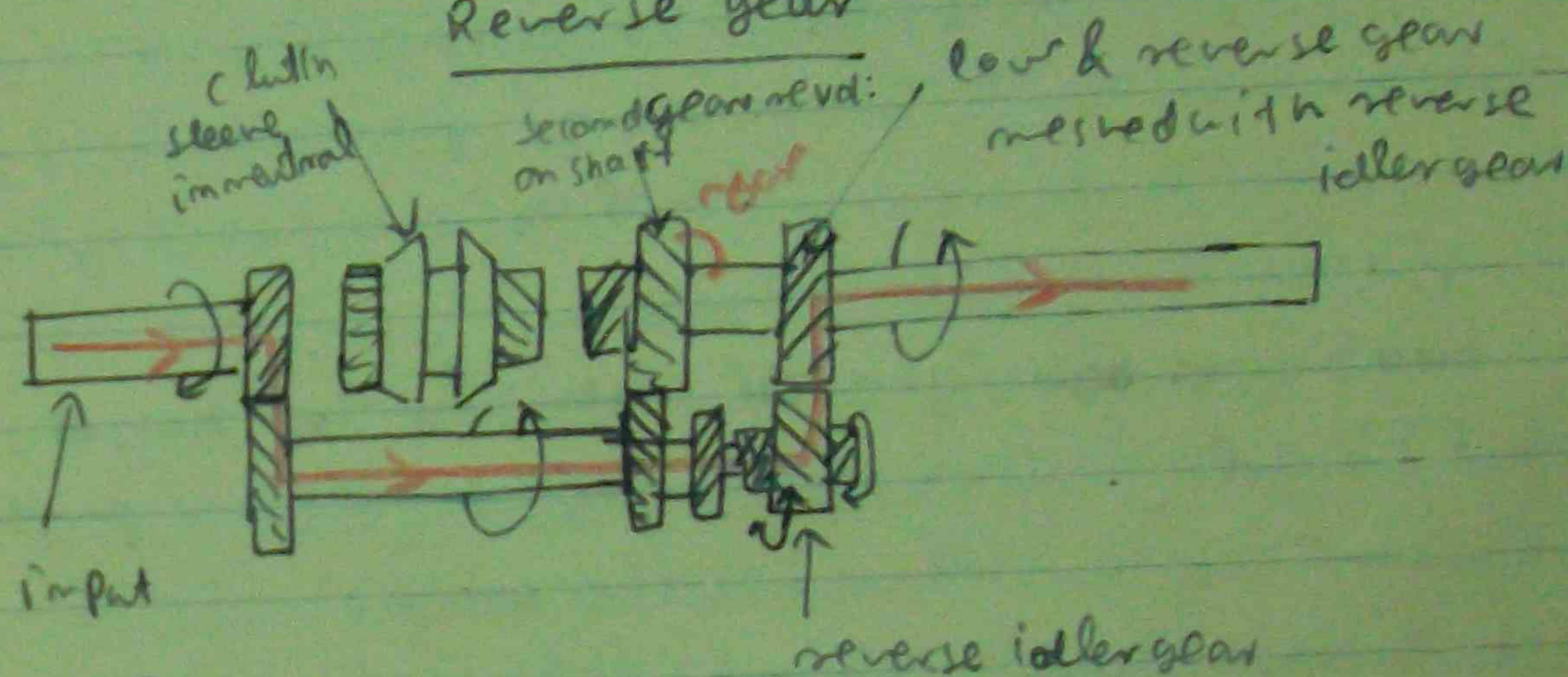
3rd gear



- Sliding gear of gear 500/611
- Synchronizer (clutch sleeve of 2nd gear) of 700/800 (engage) 600/500 of 600/500 output shaft of 600/500

clutch sleeve of input & output of gear 500/611

Reverse gear



input shaft - cluster - reverse idler - sliding gear
 output of 500/611
 idler gear of output shaft of 600/500

(3) Slipout 1st gear

- (m) Gear shift linkage up: off 1/2 up: 64/61
- (n) Gear up: up: down of. 22/2 main shaft 64/61
- (o) 1st gear 2nd up: up: 64/61
- (p) main shaft 1st end play up: up: 64/61
- (q) 1st gear 2nd up: up: 64/61
- (r) Shift lever up: off interlock spring tension up: 64/61

(4) Slipout of High

- (m) Gear shift linkage up: off 1/2 up: 64/61
- (n) Engine 1st. Transmission 64/61. 64/61: 64/61 align-ment up: 64/61
- (o) main shaft end play up: up: 64/61
- (p) gear 2nd up: up: 64/61
- (q) Shift lever up: off interlock spring tension up: 64/61
- (r) Bearing up: up: 64/61
- (s) Synchronizing unit 64/61: 64/61

(5) No power through Transmission

- Transmission 2nd Engine 64/61 power 1st.
- speed of 2nd gear 64/61 64/61 64/61 64/61 64/61
- (m) clutch 64/61 64/61
 - (n) gear 2nd up: up: 64/61
 - (o) Shift fork 1st 2nd: 64/61 64/61
 - (p) gear 1st Shift up: 64/61
 - (q) Drive keys 64/61 64/61 64/61 64/61

(6) Noisy in Neutral (Neutral 64/61 64/61)

- (m) Engine 1st. Transmission alignment up: 64/61
- (n) Bearing up: up: 64/61 (or) grease (or) oil up: 64/61
- (o) gear up: up: 64/61
- (p) counter shaft 64/61: 64/61 (or) 64/61 64/61
- (q) counter shaft end play up: 64/61

(7) Noisy in gear (gear up: 64/61 64/61)

- (m) clutch friction disc 64/61
- (n) Transmission 64/61 gear main bearing up: 64/61 (or) 64/61 grease (or) oil up: 64/61

- (a) main shaft output gear up: 60 rpm; 64 teeth.
- (b) gear up: 64 teeth.
- (c) speedometer gear up: 64 teeth.
- (d) neutral gear up: 64 teeth. up: 64 teeth.

(8) oil leak (oil seal)

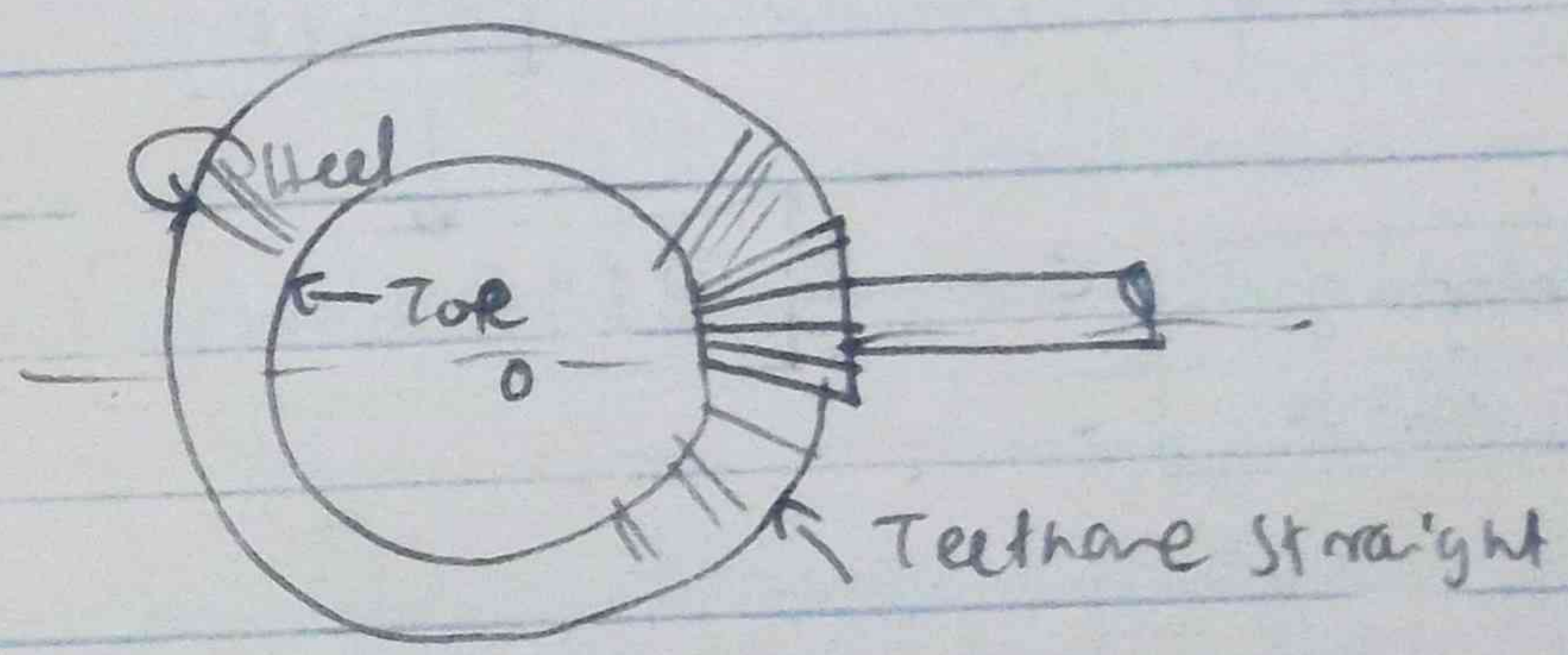
- (a) oil level 64 teeth.
- (b) gasket up: 64 teeth.
- (c) oil seal up: 64 teeth.
- (d) oil seal up: 64 teeth.
- (e) oil seal up: 64 teeth.
- (f) oil seal up: 64 teeth.
- (g) oil seal up: 64 teeth.
- (h) oil seal up: 64 teeth.
- (i) oil seal up: 64 teeth.
- (j) oil seal up: 64 teeth.
- (k) oil seal up: 64 teeth.
- (l) oil seal up: 64 teeth.
- (m) oil seal up: 64 teeth.
- (n) oil seal up: 64 teeth.
- (o) oil seal up: 64 teeth.
- (p) oil seal up: 64 teeth.
- (q) oil seal up: 64 teeth.
- (r) oil seal up: 64 teeth.
- (s) oil seal up: 64 teeth.
- (t) oil seal up: 64 teeth.
- (u) oil seal up: 64 teeth.
- (v) oil seal up: 64 teeth.
- (w) oil seal up: 64 teeth.
- (x) oil seal up: 64 teeth.
- (y) oil seal up: 64 teeth.
- (z) oil seal up: 64 teeth.

lubricating oil level 64 teeth.

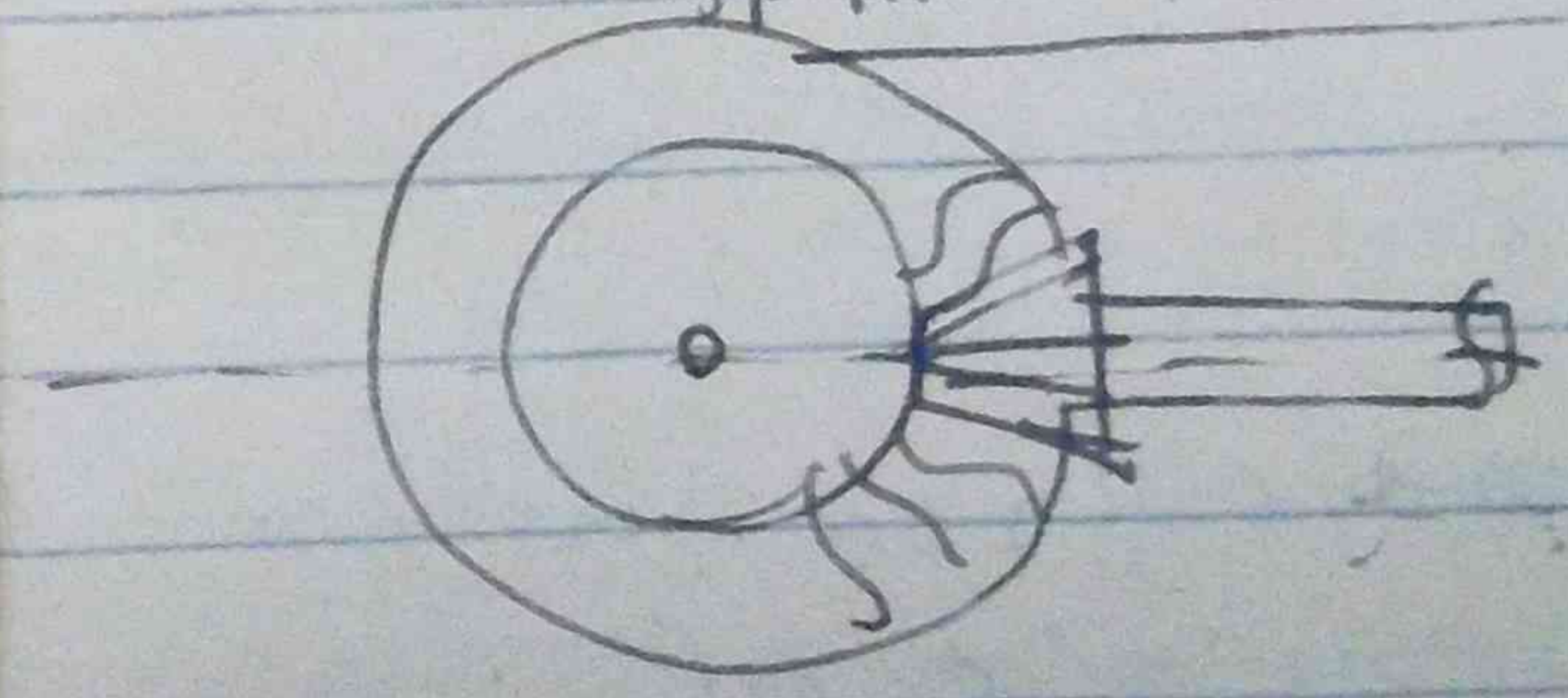
Drive lines

Joint - universal
roll & yoke type

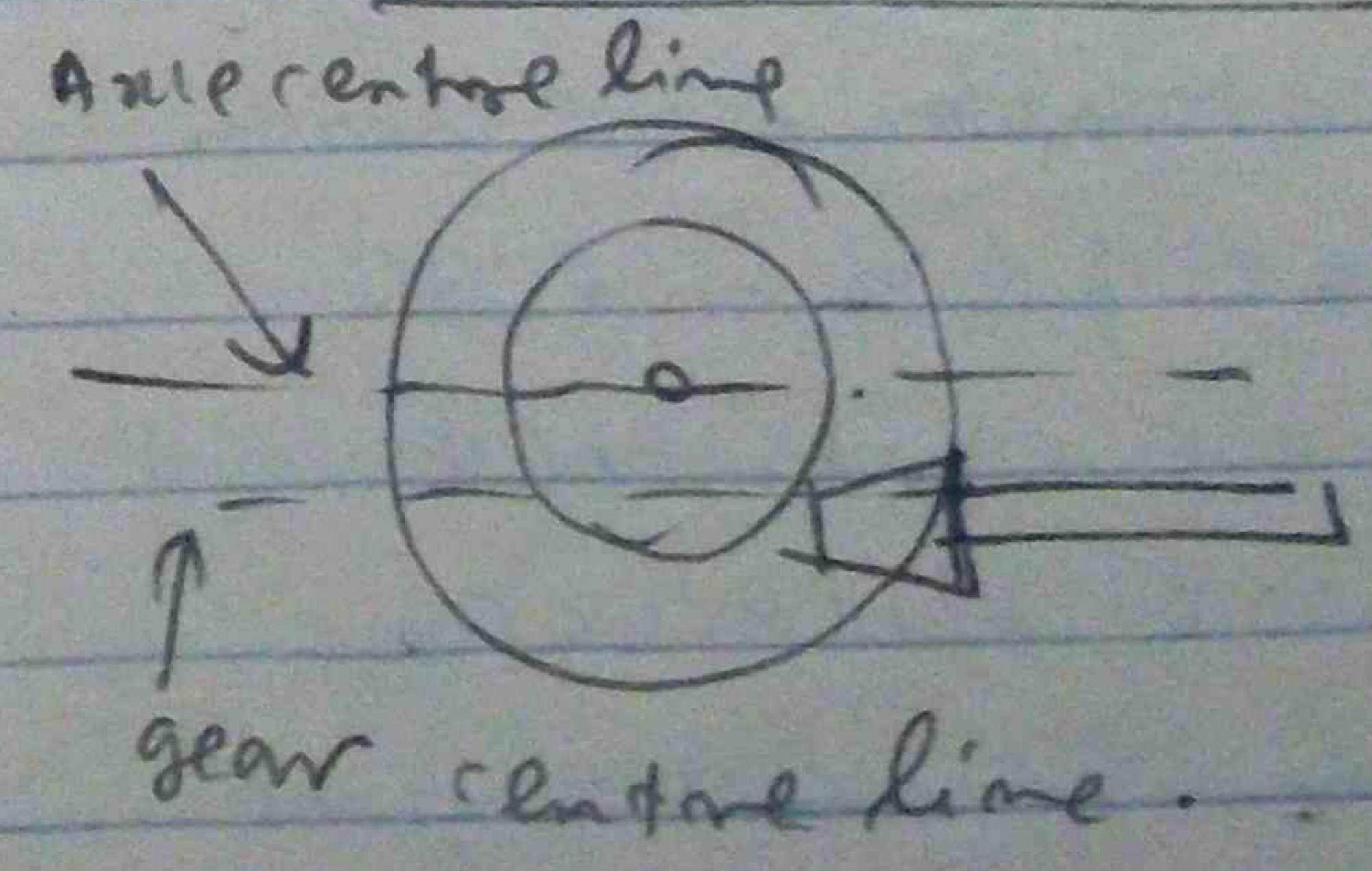
Gearing
straight bevel gearing



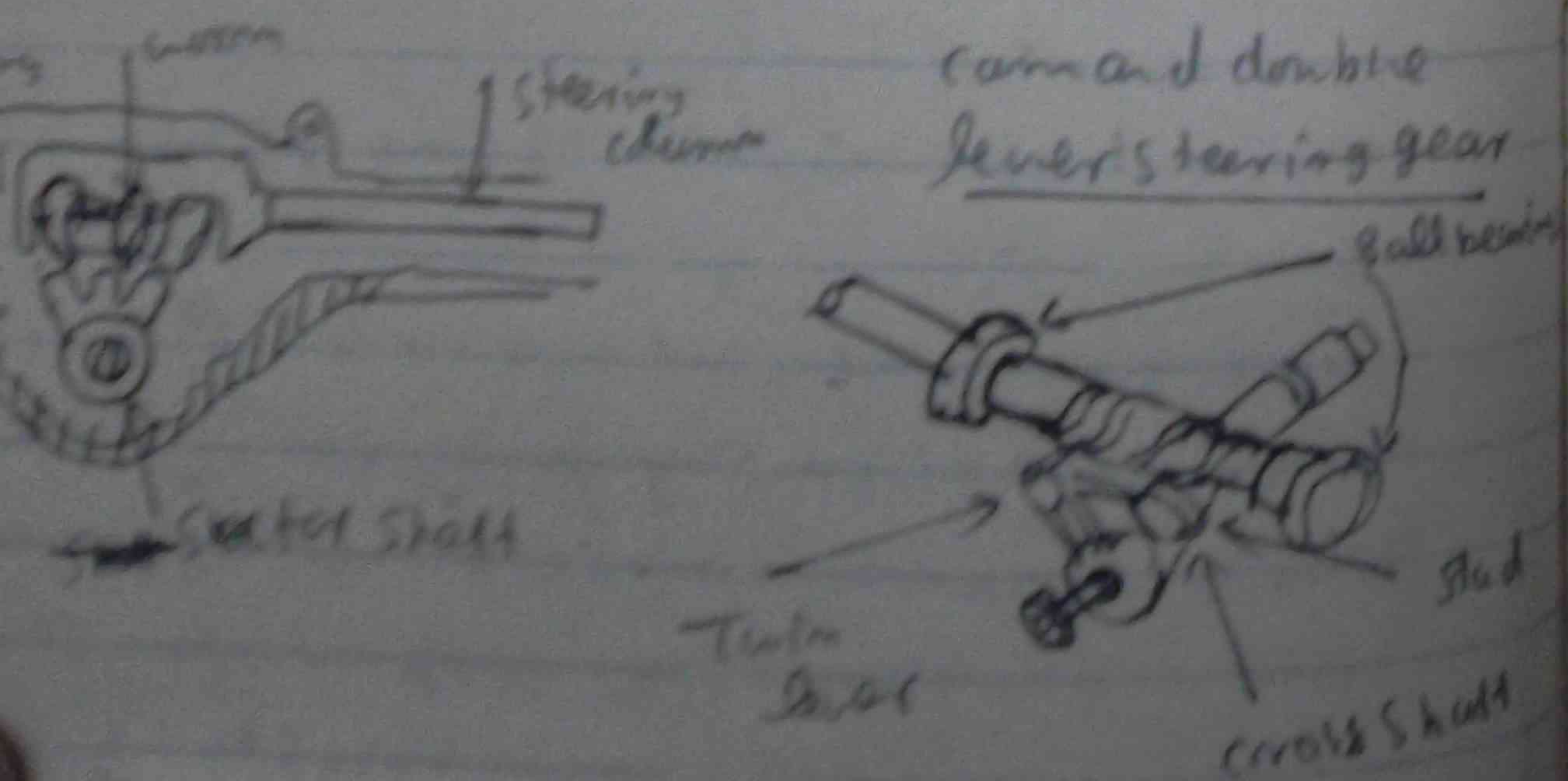
spiral bevel gearing



Hypoid gearing



2) worm and roller steering gear

[illegible]

(3) cam and lever steering system

5. 1. 2. 3. 4. 5. 6. 7. 8. 9. 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. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 8

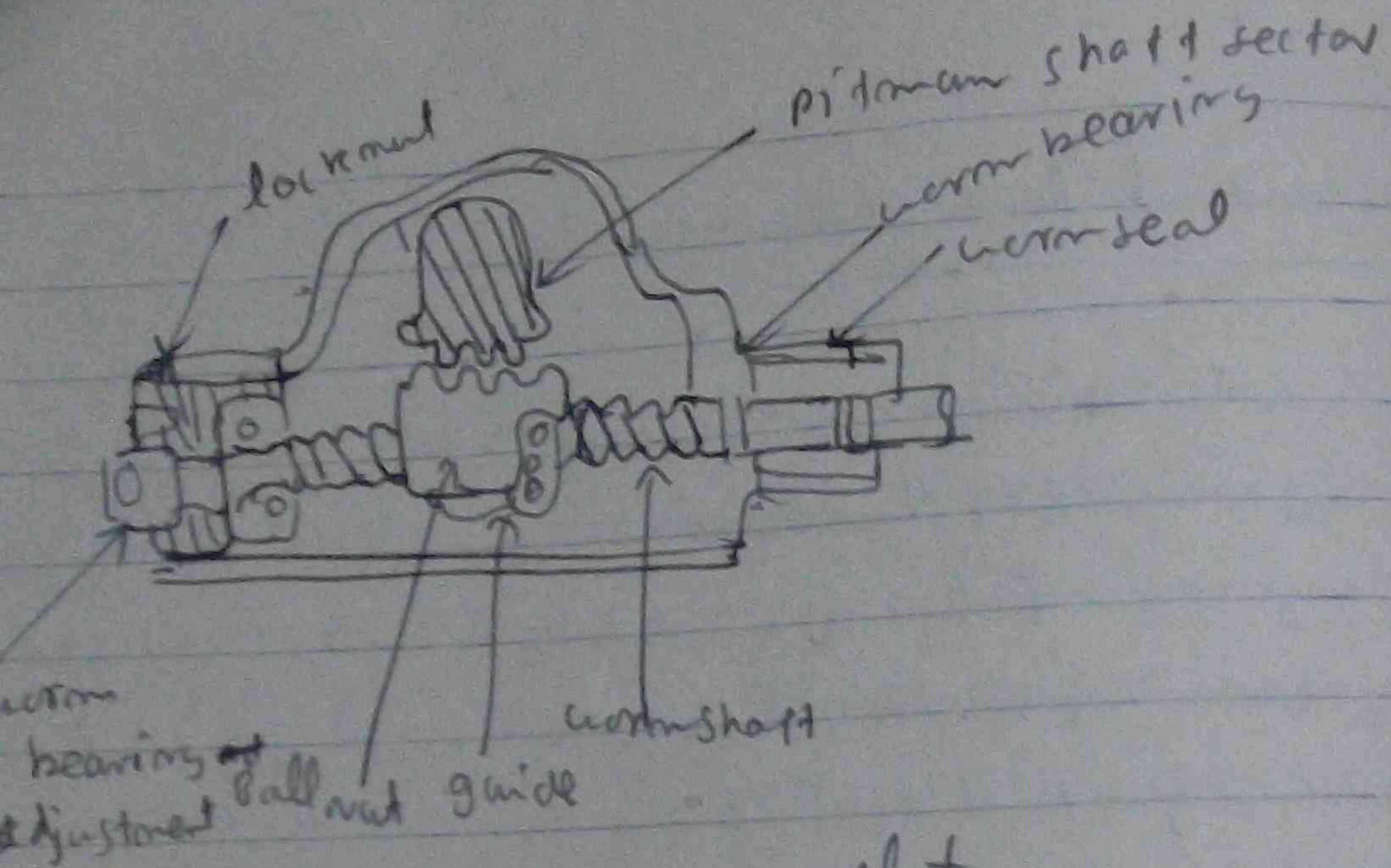
- single lever with sliding stud

- ② fusion lever sliding stud

- ③ single lever with rolling stud

- 51, (4) Tension lever with rolling

Stud 4, 56 ~: WP. 0000 2 00 00 00
Can groove ~ 1/6 00 2 00 Stud up: 000 00 00
lever gear. (cross shaft ~ 1/6 00 00 00 00 00
Knuckle ~ 1/6 00 00



(4) Recirculating ball type

It is a type of worm and ball nut steering gear. The ball nut has a spiral groove and the worm gear has a spiral groove. The balls are made of steel and are used to reduce friction between the worm gear and the ball nut. The balls are recirculated by a return guide. The steering wheel is connected to the ball nut. The balls are used to reduce friction between the worm gear and the ball nut. The balls are recirculated by a return guide. The steering wheel is connected to the ball nut.

of the worm gear and the ball nut. The balls are used to reduce friction between the worm gear and the ball nut. The balls are recirculated by a return guide. The steering wheel is connected to the ball nut.

(3) Braking system

Workshop Technology

metal cutting theory

cutting tool life

The life of the tool between regrinding

cutting tool life's depended factors

- Tool material & its quality (hardness)
- Cutting conditions (speed, feed, depth)

Time is a best economic time of tool life for every tool.

Effects of economic time

- cutting speed is made such as to allow tool to last longer than best economic time
- effect — performance is reduced to level
- because work is less than economic time
- expense and lost time for regrinding and resetting

$$V T^n = C \Rightarrow V_1 T_1^n = V_2 T_2^n = C$$

V = cutting speed ft/min

T = time taken (tool life) min

C = constant depends upon cutting condition

- $n = \frac{1}{7} \rightarrow \frac{1}{8}$ roughing cut in steel } HSS Tool
- $\frac{1}{10}$ ————— cast iron
- $\frac{1}{12}$ ————— steel & tungsten carbide tool
- $\frac{1}{15}$ light cuts in steel — HSS Tool

$n = \rightarrow$ Influenced by shape
use of cutting compound

$$n = \tan \phi = \frac{\log V_1 - \log V_2}{\log T_2 - \log T_1}$$

Example ①

When operating with roughing cuts on mild steel at 60 ft/min a certain tool gave a life of 3 hours between re-grinds. Estimate the life of this tool on similar cuts at a speed of 80 ft/min:

$$V = 60 \text{ ft/min}$$

$$T = 3 \times 60 \text{ min}$$

$$C = ?$$

$$VT^n = C \rightarrow m = \frac{1}{8} \text{ for rough steel}$$

$$VT^n = C \rightarrow 60 \times (1800)^{\frac{1}{8}} = C$$

$$C = 60 \times 114.9$$

$$VT^n = C$$

$$60 \times T^{\frac{1}{8}} = 114.9$$

$$T = 17.97 \text{ hrs} \approx 18 \text{ min}$$

Example ②

A tool cutting at 80 ft/min gave a life of 1 hour between re-grinds when operating on roughing cuts on mild steel. What will be its probable life when engaged on light finishing cuts

$$VT^n = C$$

$$80 \times [60]^{\frac{1}{8}} = C$$

$$C = 133.5$$

$$VT_2^n = C$$

$$80 \times [T_2]^{\frac{1}{8}} = 133.5$$

$$T_2 = 167.9 \rightarrow 168 \text{ min}$$

Example ③

A 2 in diam bar of steel was turned at 284 r.p.m and tool failure occurred in 10 min. The speed was changed to 232 r.p.m and the tool failed in 60 min of cutting time. Assuming a straight-line relationship exists, what cutting speed should be used to obtain a 30 min tool life (V_{30}) = ?

$$T_1 = 10 \text{ min} \quad V_1 = \text{ft/min} \Rightarrow \frac{\pi \times 2}{12} \text{ ft/rev} \times \frac{284 \text{ rev}}{\text{min}}$$

$$= \frac{\pi \times 2 \times 284}{12} \text{ ft/min} = 148 \text{ ft/min}$$

$$m = ?$$

$$T_2 = 60 \text{ min} \quad V_2 = \frac{\pi \times 2 \times 232}{12} = 122 \text{ ft/min}$$

$$m = ?$$

regd:- $T_3 = 30 \text{ min}$ $V_3 = ?$ $C = \text{const.}$

$$V_1 T_1^m = V_2 T_2^m$$

$$149 \times [10]^m = 122 [60]^m$$

$$m = 0.11$$

$$C = V_1 T_1^m = 149 (10)^{0.11} = 192$$

$$V_3 T_3^m = C$$

$$V_3 \times [30]^{0.11} = 192 \therefore V_3 = 122 \text{ fpm}$$

Exercises

- ① A certain tool when cutting cast iron had a life between regrinds of 2 hrs when cutting at 70 ft/min. If the relationship between life and speed is given by $V T^{1/10} = C$, calculate C and estimate the tool life at a speed of 60 ft/min ($C = 113, 9.33 \text{ hr}$)

- ② For the tool in question 1 plot a graph of tool life - cutting speed over a range of speeds from 100 ft/min to 60 ft/min

- ③ For a certain tool it was found that the relationship between speed and tool life was given by $V T^{1/7} = 150$ estimate the cutting speed at a given time of 2 hrs between grinding (75 ft/min)

- ④ If the relationship for high speed steel tool is $V T^{1/8} = C$, and for tungsten carbide tool $V T^{1/5} = C_2$ and assuming that at a speed of 80 ft/min the tool life was 3 hrs in each case compare their cutting lives at 100 ft/min
[Tungsten carbide / high speed steel = 2, approx]

- ⑤ For a certain tool it was found that the relationship between cutting speed (V) and tool life (T) was as follows

$$V = \frac{1472}{27.3 + T} + 73.4$$

Express T in terms of V and find T when

$$V = 80 \text{ ft/min}$$

$$(T = \frac{1472}{V - 73.4} - 27.3, 197)$$

Effect of the size of cut

$$K = VT^n f^{m_1} d^{m_2}$$

f = feed in/rev.

d = depth of cut in

m_1 = exponent of feed (0.5 → 0.8)

m_2 = exponent of depth of cut (0.2 → 0.4)

For const. tool life

cutting speed is more sensitive to changes in feed than in depth of cut.

$$V \propto f^{\alpha_1} d^{\alpha_2}$$

Tool life is more sensitive to change in feed, feed

① than in depth of cut

② less in depth of cut

$$T \propto V^{\frac{1}{n}}$$

$$\propto f^{\frac{m_1}{n}}$$

$$\propto d^{\frac{m_2}{n}}$$

Example ①

The following equation has been obtained when machining AISI 2340 Steel cutting tool having a 8, 22, 6, 6, 15, 3164 Tool signature

$$2.035 = VT^{0.13} f^{0.77} d^{0.37}$$

A 100-min tool life was obtained using the following cutting conditions:

$$V = 75 \text{ fpm} \quad f = 0.0125 \text{ in/rev} \quad d = 0.100 \text{ in}$$

calculate the effect of a 20% increase in each of the above parameters taken together.

If $V = 20\%$ increased

$$V = 1.2 \times 75 = 90$$

$$C = VT^{0.13} f^{0.77} d^{0.37}$$

$$\frac{0.13}{T} = \frac{C}{V f^{0.77} d^{0.37}} = \frac{2.035}{90 \times (0.0125)^{0.77} \times (0.100)^{0.37}}$$

$$T = \left[\frac{2.035}{90 (0.0125)^{0.77} \times (0.100)^{0.37}} \right]^{\frac{1}{0.13}} = 31 \text{ min}$$

f = 20% increased

$$T = \left(\frac{2.035}{75 \times (1.2 \times 0.0125)^{0.77} \times (0.100)^{0.37}} \right)^{\frac{1}{0.13}}$$

$$= 5 \text{ min}$$

d = 20% increased

$$T = \left(\frac{2.035}{75 (0.0125)^{0.77} \times (0.1 \times 1.2)^{0.37}} \right)^{\frac{1}{0.13}}$$

$$= 73 \text{ min}$$

If v , f & d are increased

$$T = \left(\frac{2.035}{90 \times (1.2 \times 0.0125)^{0.77} \times (0.1 \times 1.2)^{0.37}} \right)^{\frac{1}{0.13}}$$

$$= 7.5 \text{ min}$$

the same tool life if (a) depth of cut is doubled
(b) the feed is doubled

Also calculate the percentage increase in the metal removal rate for both cases

$$u = v T^{0.12} f^{0.61} d^{0.36}$$

$$v = 150 \text{ fpm} \quad f = 0.009 \text{ in} \quad d = 0.0625 \text{ in}$$

feed doubled

$$u = \frac{150}{150} (T)^{0.12} (0.009)^{0.61} \times (0.0625)^{0.36} \quad \text{--- (1)}$$

$$u = v_2 (T)^{0.12} (0.018)^{0.61} \times (0.0625)^{0.36}$$

$$1 = \frac{v_1}{v_2} \times \left[\frac{0.009}{0.018} \right]^{0.61}$$

$$\frac{150}{v_2} = [2]^{0.61}$$

$$v_2 = \frac{150}{2^{0.61}} = \frac{150}{1.517} = 98.5$$

$$\text{decrease} = 150 - 98.5 = 51.5$$

$$\% = \frac{51.5}{150} \times 100 = 34.4\%$$

depth of cut doubled

$$1 = \frac{v}{v_2} \times \left[\frac{1}{2} \right]^{0.36}$$

$$v_2 = \frac{150}{2^{0.36}} = \frac{150}{1.294} = 117$$

$$\text{decrease} = 150 - 117 = 33$$

$$\% = \frac{33}{150} \times 100 = 22\%$$

② When machining SAE 1020 steel with high speed steel tools at the conditions of 150 fpm 0.009 ipr feed and 0.0625 in depth of cut, the following equation was found to be valid

$$u = v T^{0.12} f^{0.61} d^{0.36}$$

What decrease in speed would be necessary to maintain

$$\frac{N_{n+1}}{N_n} = \frac{V_{max}}{V_{min}} = \text{constant } (\phi)$$

geometric progression ratio

$$\phi = N-1 \sqrt{R}$$

2(GP)

R = range of spindle speed ^{covered} by device
 N = number of diff in spindle speed

$$\phi_{AP} = \frac{\text{Top speed} - \text{bottom speed}}{(N-1) \text{ interval}}$$

If 8 speed (e.g. 8 speeds)
 Interval = $N-1$ (number of a)

$$\text{dia. of drill} = \frac{\text{5th } 1^{\text{st}} \text{ drill}}{\phi}$$

$$R = \frac{N_{max}}{N_{min}}$$

Example 1

A lathe is to be designed to take a range of work varying from $\frac{1}{2}$ inch to 12 inch, with an allowable cutting speed of 60 ft/min, and 8 diff. spindle speeds. Calculate the speeds if arranged in (a) Arithmetic Progression (b) Geometric Progression.

$$V_{max} = V = \frac{N_{max}}{D_{min}} = \frac{V}{\pi D} \quad V = \text{ft/min}$$

$$N = \frac{V}{\pi D}$$

$$N_{max} = \frac{V}{\pi D_{min}}$$

$$= \frac{60}{\pi \times \frac{1}{2}}$$

$$= 458.7 \text{ rpm}$$

$$N_{min} = \frac{V}{\pi D_{max}}$$

$$N = \frac{60}{\pi \times 12}$$

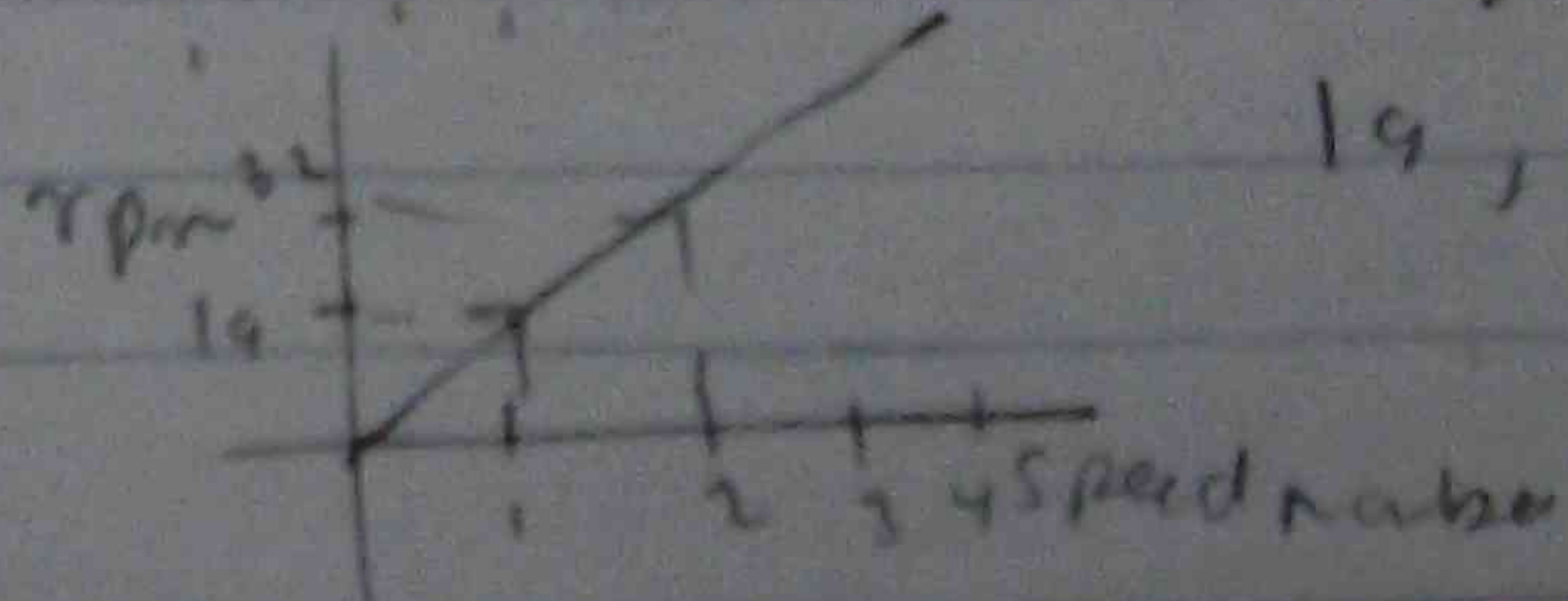
$$= 19.8 \text{ rpm}$$

$$\text{Arithmetic progression} = (N-1) = (8-1) = 7 \text{ interval}$$

$$\text{or } \phi = \frac{\text{Top} - \text{bottom}}{\text{interval}} = \frac{458 - 19}{7} = 63$$

$$19, (19 + 63), (19 + 2 \times 63) \dots 458$$

$$19, 82, 145 \dots 372, 435, 498$$



(b) Geometric progression

$$\phi = \sqrt[N-1]{R}$$

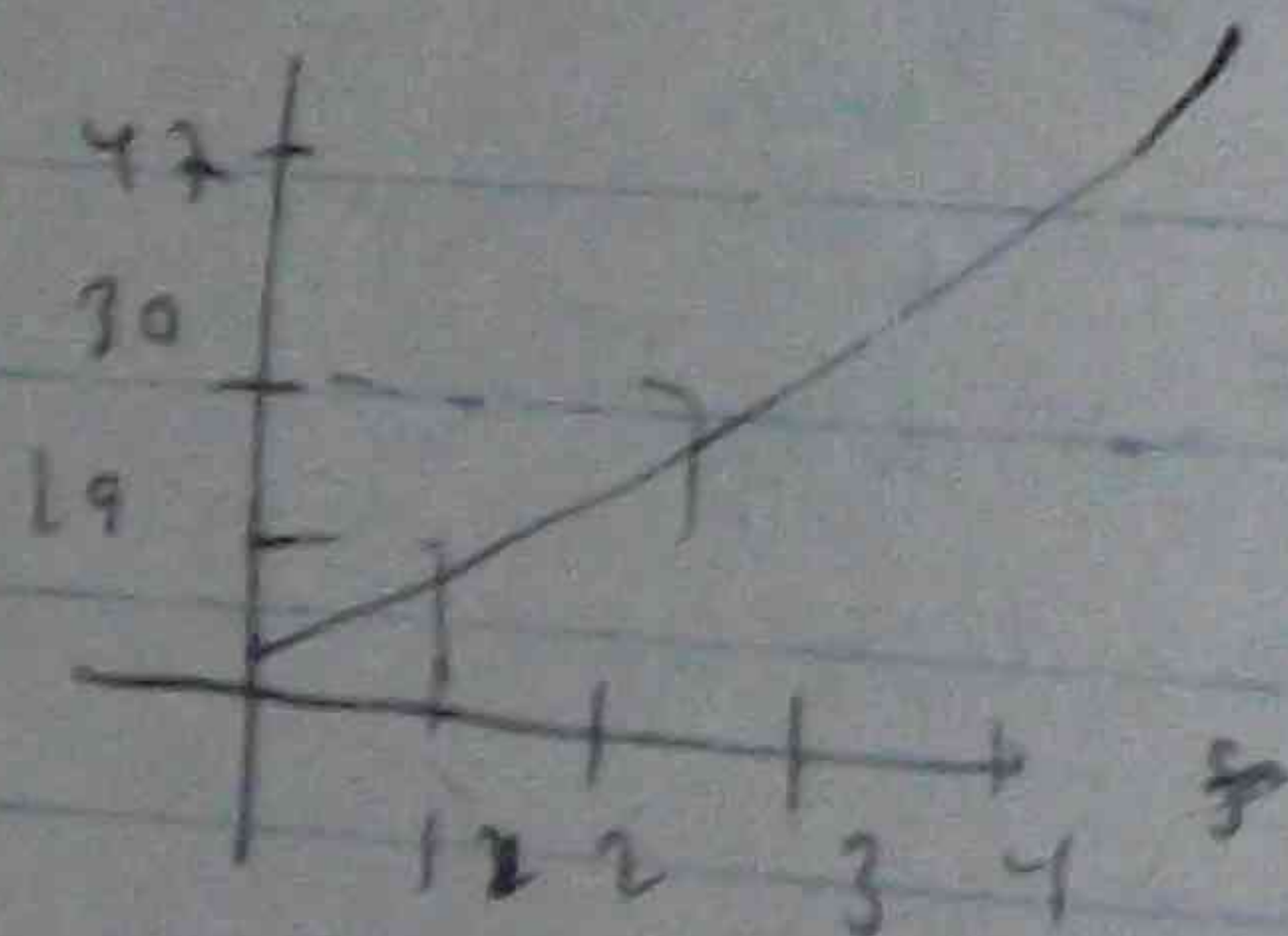
$$= \sqrt[7]{\frac{458}{19}}$$

$$= 1.575 \sqrt[7]{24.1}$$

$$= 1.575$$

$$19, (19 \times 1.575), (19 \times 1.575^2), (19 \times 1.575^3)$$

$$19, 30, 47, \dots, 290, 458 \text{ rpm}$$



| Speed | AP | GD |
|-------|-----|-----|
| 1 | 19 | 19 |
| 2 | 30 | 30 |
| 3 | 47 | 47 |
| 4 | 74 | 74 |
| 5 | 116 | 116 |
| 6 | 183 | 183 |
| 7 | 290 | 290 |
| 8 | 458 | 458 |

Example 2

calculate a suitable range of six speeds for a drilling machine, if the size range of the machine is to be from $\frac{1}{8}$ in to $\frac{1}{2}$ in drills and cutting speed of 60 ft per min is to be given. Show a speed table with suitable drill size for each speed.

$$N_{max} = \frac{V}{\pi D_{min}} = \frac{60}{3.14 \times (\frac{1}{8})} = 1830$$

$$N_{min} = \frac{V}{\pi D_{max}} = \frac{60}{3.14 (\frac{1}{2})} = 458 \text{ rpm}$$

$$\phi = \sqrt[N-1]{\frac{N_{max}}{N_{min}}}$$

$$= \sqrt[6-1]{\frac{1830}{458}}$$

$$= 1.319$$

$$1^{st} \text{ speed} = 458 \text{ rpm}$$

$$2^{nd} \text{ " } = 458 \times 1.319 = 605 \text{ rpm}$$

$$3^{rd} \text{ " } = 605 \times 1.319 = 800 \text{ "}$$

$$4^{th} \text{ " } = 800 \times 1.319 = 1055 \text{ "}$$

$$5^{th} \text{ " } = 1055 \times 1.319 = 1390 \text{ "}$$

$$6^{th} \text{ " } = 1390 \times 1.319 = 1830 \text{ "}$$



1st Speed 458 rpm suitable for $\frac{1}{2}$ in drills

2nd " 800 " $= \frac{1}{2} \times \left(\frac{458}{800} \right) = 0.286 = \frac{9}{32}$

3rd " 1055 " $= \frac{1}{2} \left(\frac{458}{1055} \right) = 0.218 = \frac{7}{32}$

4th " 1390 " $= \frac{1}{2} \left(\frac{458}{1390} \right) = 0.165 = \frac{5}{32}$

5th " 1830 " $= \frac{1}{2} \left(\frac{458}{1830} \right) = 0.125 = \frac{1}{8}$

| | | | | | | |
|--------|---------------|----------------|----------------|----------------|---------------|------|
| rpm | 458 | 603 | 800 | 1055 | 1390 | 1830 |
| drills | $\frac{1}{2}$ | $\frac{9}{32}$ | $\frac{7}{32}$ | $\frac{5}{32}$ | $\frac{1}{8}$ | |

③ On a 16 in stroke single pulley all geared shaping machine the number of turns of the driving pulley required to make one complete double stroke of ram were found to be as follows

- 1st speed 27 turns
- 2nd speed 16 turns
- 3rd speed 8 turns
- 4th speed 4 turns

Assuming the cutting time + return time to be 1.25/ and to remain constant. estimate

a suitable pulley speed to give an average cutting speed of 45 ft/min in the lowest gear and on the longest stroke.

With this pulley speed, find the most suitable stroke for each of the other speeds.

$$\phi = \phi = 1^{st} \text{ speed} = \frac{\pi \times N}{1000} = \frac{V}{\pi \times D}$$

506, 9 1/2 in, 4 3/4 in, 2 3/2 in

④ The highest spindle speed for a small lathe is 1500 rpm. In order to obtain a suitable cutting speed for drilling some 1/8 in holes in brass, a drill head is mounted on the carriage, and driven in the opposite direction to the spindle. At what speed must the drilling spindle be driven to give a cutting speed of 290 ft/min

$$N = \frac{V}{\pi \times D} = \frac{1500 \times 290}{3.14 \times \frac{1}{8}}$$

45 1500 rpm = N_{max}

$$\phi =$$

$$N = \frac{V}{\pi \times D}$$

$$Q = \frac{V}{3.14 \times 4009} = \frac{200 \times 12}{3.14 \times 4609}$$

$$= \frac{2400}{14500} = \frac{1}{7} \checkmark$$

1500 rpm suitable for 1/8 holes

$$N_{min} = \frac{V}{\pi \times D_{min}}$$

$$N_{min} = \frac{200 \times 12}{3.14 \times 20000}$$

$$D_{min} = \frac{200}{3.14 \times 1500} = \frac{200 \times 12}{4720} = \frac{2400}{4720}$$

$$= 0.51 = 0.51$$

$$D_{min} = 0.51$$

$$D_{max} = 0.125$$

$$\frac{N_{max}}{N_{min}} = \frac{D_{min}}{D_{max}}$$

$$N_{max} = \frac{0.51}{0.125} \times 1500$$

$$= 6120$$

$$= 4500$$

$$4500 \text{ rpm}$$

⑤

The speed-change device of a drilling machine is required to have 18 spindle speed. A variable speed motor is to be used having a max. speed 1200 rpm. speed ratios: 1/8 spindle speed interval in G. P. up to 800 rpm. If the gear box arrangement is such that for every speed of motor, 3 separate speeds can be driven to the spindle by means of 3 clutches find all speed of motor and spindle.

$$\text{spindle} = 800 \text{ rpm}$$

