

List No. 11
w.e.f. Jan. 15, 2017

Laminated & Framed on Wooden Board



Mechanical Engineering

Charts, Models & Instruments

Laminated & attached with plastic strips



Pioneers of Mechanical Engg.



Mechanical Model



521 CHARTS

Thick Laminated both sides & attached with Plastic Strips
 Thick Laminated & Framed on NU-Wood Board

Size 20"x26"

I. Workshop Charts

1. SAFETY MEASURES

- S-1 Personal Protection
 - S-2 First Aid Materials
 - S-3 Hazchem Symbols
 - S-4 Ergonomics
 - S-5 Fire Preventions
 - S-6 Machine Handling Safety Measures
 - S-7 Precautions in Workshop
 - S-8 Safety on a Fitting Bench
 - S-9 Safety on a Drilling Machine
 - S-10 Safety on Lathe Machine
 - S-11 Safety on Shaper Machine
 - S-12 Safety on Milling Machine
 - S-13 Safety on Surface Grinder
 - S-14 Safety in Press Work
 - S-15 Safety in Carpentry
 - S-16 Safety in Sheet Metal Work
 - S-17 Safety in Foundry
 - S-18 Safety in Welding
- **Air craft Safety Charts Pg No. 10**

2. CARPENTRY

- WS 35 Marking Tools in Carpentry
- WS 36 Measuring Tools in Carpentry
- WS 37 Types of Saws
- WS 38 Types of Chisels
- WS 39 Types of Planes
- WS 40 Braces in Carpentry
- WS 41 Holding Tools in Carpentry
- WS 42 Hand Tools used in Carpentry
- WS 43 Carpentry Joints-I
- WS 44 Carpentry Joints-II
- WS 45 Types of Patterns

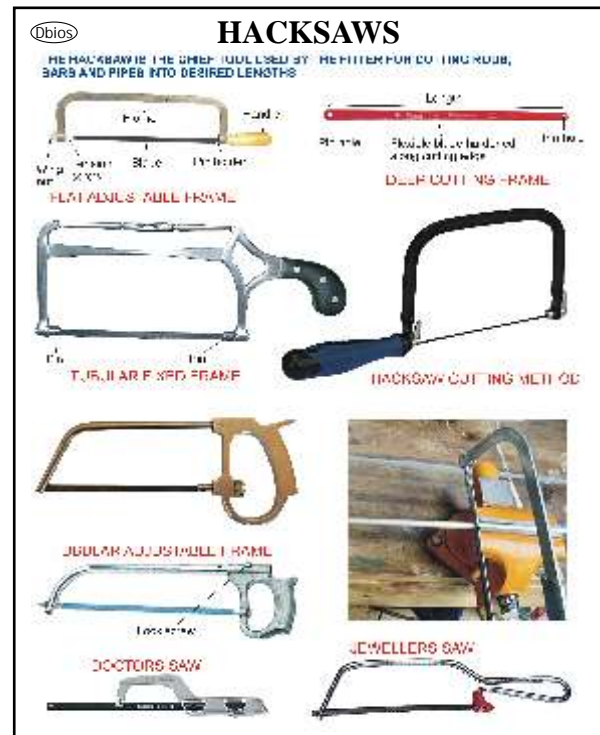
3. FITTING

- WS 51 Vernier caliper
- WS 61 Hacksaws
- WS 62 Wrenches
- WS 63 Holding Tools (Types of Vice)
- WS 64 Striking Tools (Hammer)
- WS 65 Cutting Tools (Chisels)
- WS 66 Types of Files
- WS 67 Taps and Dies
- WS 68 Reamers
- WS 69 Pipe Fittings
- WS 70 Methods of Filling
- WS 71 Hand Tools Used in Fitting shop
- WS 72 Forging Tools

4. SMITHY

- WS 15 Blacksmith's Hammers
- WS 16 Blacksmith's Tongs
- WS 17 Blacksmith's Appliances
- WS 18 Blacksmith's Hand tools (Chisel & Swages)
- WS 19 Blacksmith's Hand tools (Fullers, Punching & Drift)
- WS 20 Blacksmith's Welds
- WS 21 Hand Forging Operations
- WS 22 Flatter and Set Hammer
- WS 23 Punches and Drifting
- WS 24 Heat Treatment of Metals

Ask for Big Sized 30X40" Laminated Dbios Charts



WS 61 WRENCHES

5. SHEET METAL TOOLS

- WS 80 Sheet Metal Tools-I
- WS 81 Sheet Metal Tools-II
- WS 82 SWG Chart
- WS 83 Types of Snips
- WS 84 Types of Joints
- WS 85 Shearing Machine
- WS 86 Banding Machine
- WS 87 Rolling Machine
- WS 88 Sheet Metal Process
- WS 89 Hand Tools
- WS 90 Blanking & Piercing Dies
- WS 91 Progressive Die
- WS 92 Drawing Die
- WS 93 Combination Die Set

6. FOUNDRY

- WS 100 Cupola Furnace
- WS 101 Blast Furnace
- WS 102 Electric Arc Furnace
- WS 103 Foundry Hand tools-I
- WS 104 Foundry Hand tools-II
- WS 105 Centrifugal casting
- WS 106 Centrifugal Casting Methods
- WS 107 Molding Boxes
- WS 108 Oil Fired Furnace
- WS 109 Magnetic Separator
- WS 110 Sand Muller
- WS 111 Sieve Shaker

Size 20"x26"

Thick Laminated both sides & attached with Plastic Strips
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- WS 112 Sand Rammer
- WS 114 Electric Oven (Kiln)
- WS 115 Slush Casting
- WS 116 Continuous Casting
- WS 117 Gating System
- WS 118 Patterns in Foundry
- WS 119 Molding Methods
- WS 120 Mold & Core

7. WELDING

- WS 1 Types of Welded Joints
- WS 2 Electric Resistance Welding
- WS 3 Spot Welding
- WS 4 Seam Welding
- WS 5 Flash Welding
- WS 6 Electric Arc Welding
- WS 7 Submerged Arc Welding
- WS 8 Thermit Welding
- WS 9 Oxy - Acetylene Torch
- WS 10 Gas Flames
- WS 11 Basic Weld Symbols
- WS 12 Supplementary weld Symbols
- WS 13 Laser Beam Welding
- WS 14 Atomic Hydrogen Welding
- WS 14a TIG & MIG Welding
- WS 14b Welding Torches
- WS 14c Electroslag Welding

8. MACHINE SHOP / MACHINE TOOLS

- WS 53 Lathe Machine
- WS 54 Shaping Machine
- WS 55 Drilling Machine
- WS 56 Grinding Machine
- WS 57 Milling Machine
- WS 58 Milling Cutter-I
- WS 59 Milling Cutter-II
- WS 126 Milling Attachments
- WS 127 Typical Milling operations
- WS 128 Column and knee type Milling Machine
- WS 129 Vertical Milling Machine
- WS 130 Types of Rolling mills
- WS 131 Types of Screws
- WS 132 Bearings
- WS 133 Capstan Lathe Machine
- WS 134 Turret Lathe Machine

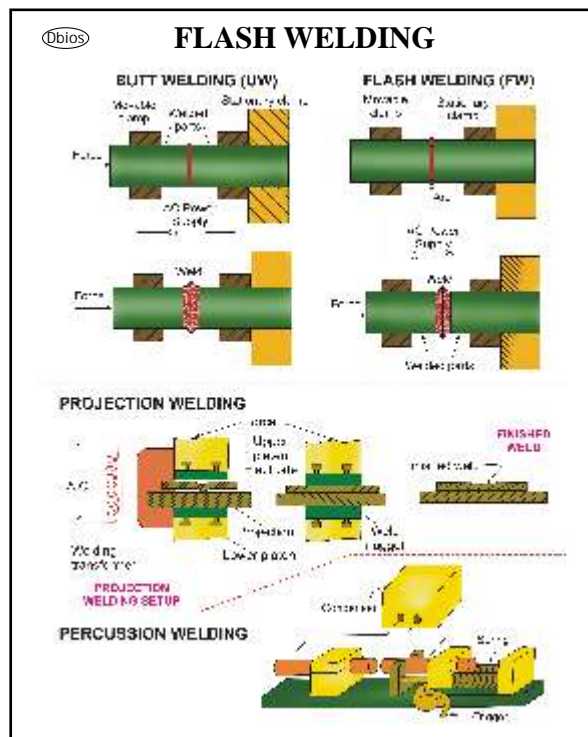
9. METROLOGY

- WS 51 Vernier Caliper
- WS 157 Vernier Depth Gauge
- WS 154 Gear Tooth Vernier Caliper
- WS 52 External Micrometer
- WS 152 Depth & Inside Micrometer
- WS 140 Testing of Mechanical Properties.
- WS 141 Non Destructive testing (Ultrasonic, Magnetic Particles, Liquid penetration, Radiographic and Eddy-current)
- WS 142a Destructive testing -I
- WS 142a Destructive testing -II (Stress, Crush, Hardness Test)
- WS 143 Technology Properties -Casting
- WS 144 Technology Properties - Forging (Up-set test, Punching Test, Plying test)

- WS 145 Technology Properties - Welding test (Hot & Cold cracking, Embrittlement Bending etc.)
- WS 146 Technology Properties - Hot & cold working
- WS 148 Sheet testing Ericksen test.
- WS 149 Pipe Testing- Compression Test
- WS 153a Fits
- WS 153b Selection of Fits
- WS 155a Measurement of Thread-I
- WS 155b Measurement of Thread-II
- WS 156 Tool Maker's Microscope
- WS 158 Vernier Height Gauge

10. AUTO-ENGINEERING

- WS 25 Two Stroke Operation
- WS 26 Four Stroke Operation
- WS 27 Single Cylinder Engine
- WS 28 Four Stroke Petrol Engine
- WS 29 Four Stroke Diesel Engine
- WS 30 Coil System of Ignition
- WS 31 Spark Plugs
- WS 32 Layout of Simple Fuel injection
- WS 33 Four Speed Sliding Gear Box



WS 5 FLASH WELDING

Ask for Big Sized 30X40" Laminated Dbios Charts

New 03 Mechanical Symbols

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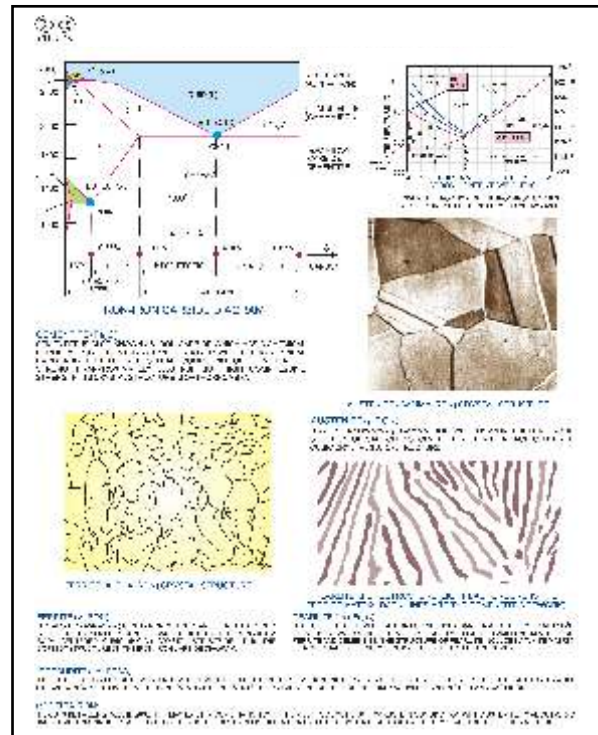
Size 20''x26''

II. Engineering Graphics Charts

- CH 2401 1st Angle and 3rd Angle projections
- CH 2402 Drawing of different geometrical shapes
- CH 2403 Drafting Instruments
- CH 3101 Description, Conventions and uses of various Lines (According to I.S.I 1972)
- CH 3102 Convention for various materials & breaks
- CH 3103 Conventional representations of common features
- CH 3104 Conventional representation of springs (According to ISI)
- CH 3105a Position of a points-I (Vertical & Horizontal)
- CH 3105b Position of a points-II (In Four Quadrants)
- CH 3106a Projection of straight line in different quadrants-I
- CH 3106b Projection of straight line summary
- CH 3107 Summary of Projections of Planes
- CH 3108 Types of Solids
- CH 3109a Section of Solids-I (Classification & Term used)
- CH 3109b Section of Solids-II (Classification & Term used)
- CH 3110 Development of surfaces (Methods of development)
- CH 3111a Parallel Line Method-I (Development of Right Prism)
- CH 3111b Parallel Line Method-II (Development of Right Cylinder)
- CH 3111c Parallel Line Method-III (Development of Pipe)
- CH 3112 Radial Line Method (Development of right pyramid, Development of right cone)
- CH 3113 Projection of planes.
- CH 3114a Orthographic Projection -I
- CH 3114b Orthographic Projection-II (Types of Pictorial Projection)
- CH 3114c Orthographic Projection-III (Comparison of first and third Angle Projections)
- CH 3115 Types of Sectional views
- CH 3116a Important sections-I (Partial or broken out section, offset section, Revolved section)
- CH 3116b Important sections-II (Thin Material in Section Spokes of Wheel in Section)
- CH 3116c Important sections-III (Web in Section, Correct and Incorrect Section for Rib, Casting of an Object with Quarter Postion Removed)
- CH 3117 Basic commands of Auto CAD
- CH 3118 Basic commands of Pro E
- CH 3119 Basic commands of CAM.

III. Drawing of Mechanical Elements Charts

- CH 1635 Cross Head for a Horizontal Steam Engine (Details & Arrangement)
- CH 1636 Cross Head for a Vertical Steam Engine (Details & Arrangement)
- CH 1637 Stuffing Box for a vertical steam engine (Details & Arrangement)
- CH 1638 Tool Holder for a planning machine
- CH 1639 Lathe Tail Stock (Details & Arrangement)
- CH 1640 Pipe Vice (Details)
- CH 1641 Petrol Engine Connecting Rod
- CH 1642 Gears: Spur & Bevel Terminology
- CH 1643 Plumber Blocks (Details & Arrangement)
- CH 1644 Angle Plumber Blocks (Details & Arrangement)
- CH 1645 Foot - Step Bearing (Details & Arrangement)
- CH 1646 Wall Brackets
- CH 1647(I) Cotter Types
- CH 1647(II) Cotter Joints



CH 3128
Iron-Iron Carbide Equilibrium Diagram

- CH 1648(I) Nuts Types
- CH 1648(II) Nut Threads
- CH 1649(I) Bolts Types
- CH 1649(II) Bolt Threads
- CH 1650(I) Rivets Types
- CH 1650(II) Rivets Joints
- CH 1651 Keys & Pins

IV. Material & Metallurgy Charts

- CH 1674 Types of Crystal Structures
- CH 1675a Lattice Defects -I: Point
- CH 1675b Lattice Defects- II: Line/ Surface/ Volume
- CH 1676 Heat Treatment Processes: Annealing, Normalizing, Hardening/Quenching, Tempering, and Surface Hardening.
- CH 1677 T-T Diagram (Time, Temperature, Transportation)
- CH 1678 Iron - Carbon Diagram
- WS 100 Cupola Furnace
- CH 3122 Grain Size
- CH 3123 Cu-Zn Diagram & Cu-Su Diagram
- CH 3124 Comparison of Optical & Electron Microscope
- CH 3125 Hardness Conversion Table
- CH 3126 Material Weight & Volume Chart
- CH 3127 Cooling Curve for Pure iron
- CH 3128 Iron-Iron Carbide Equilibrium Diagram
- CH 3129 Induction Hardening Coils
- CH 3130 Specific Effects of Alloying
- CH 3131 Comparative Properties of some tool steels
- CH 3132 Cu-Silicon Phase Diagram (Cu-rich)
- CH 3133 Titanium Alloys phase Diagram

Ask for Big Sized 30X40'' Laminated Dbios Charts

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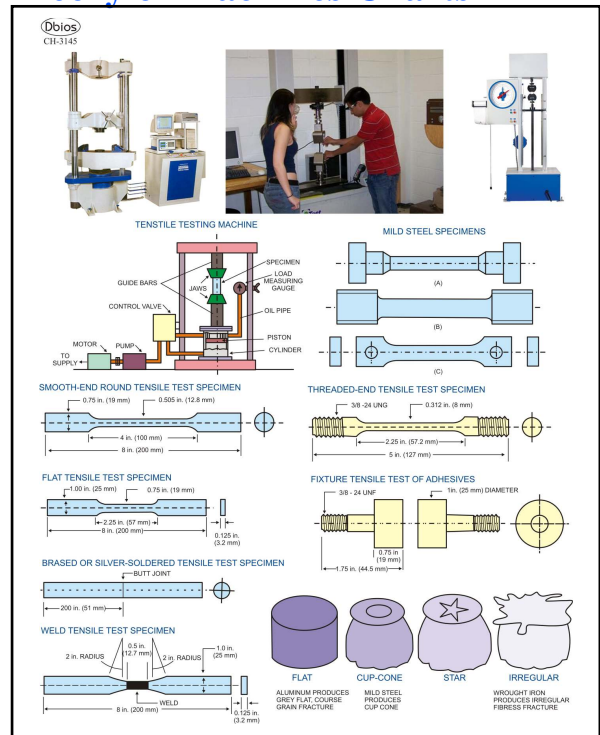
V. SOM/Testing of Mechanical Properties Charts

- CH 3140 Semi Destructive Testing (Hardness Indentation Method)
- CH 3141a Mechanical Properties-I
- CH 3141b Mechanical Properties-II
- CH 3142a Introduction to stress - strain curve-I
- CH 3142b Introduction to stress - strain curve-II
- CH 3143 Hook's Law
- CH 3144 Hardness Tests
- CH 3145 Drawing of UTM (Machine & Samples)
- CH 3146 Drawing of Torsion Testing Machine (Machine & Samples)
- CH 3147 Drawing of Indentation Process in Hardness
- CH 3125 Hardness Conversion table

VII. Theory of Machines Charts

- CH 1665 (I) Belt Drives (Flat): Open Belt, Crossed or Twist, Belt drive with idler pulleys, compound belt, stepped or cone pulley.
- CH 1665 (II) Belt Drives (Flat): Length of open belt and cross belt drive, power transmission by a belt, Ratio of driving Tension for flat belt drive, Angle of contact-open & crossed belt drive, centrifugal tension.
- CH 1665 (III) Drives ('V' Belt & Rope): 'V' Belt: Cross-section of 'V'-Belt and 'V' grooved pulley. Rope: Cross-section of a rope and sheave (grooved pulley) for ropes. Rope brake dynamometer.
- CH 1665 (IV) Chain Drives: Chain and sprocket, Hoisting and Hauling, Conveyor chain and bush roller chain.
- CH 1666 (I) Toothed Wheel (Gear): Friction and toothed wheels, Gearing, Terminology, Involute teeth.
- CH 1666 (II) Gear Train: Simple, Compound, Reverted and Epicyclic gear train.
- CH 1667 Governors: Centrifugal governor, Pendulum type:- Watt governor Loaded type, Dead weigh (porter & proell) Spring Controlled:- Hartnell.
- CH 1668 (I) Cams: Cam with knife-edge, Roller, Flat faced, Spherical faced & with offset follower, Cylindrical cam with reciprocating and oscillating follower. Terminology of radial cam.
- CH 1668 (II) Cams: Displacement, Velocity and acceleration diagrams when the follower moves with- uniform velocity, simple harmonic motion, uniform acceleration and retardation and cycloidal motion.
- CH 1669 (I) Balancing (Rotating Masses): Single rotating mass by a single mass rotating in the same plane, Two masses in different planes when the plane of single rotating mass lies in between the planes of two balancing masses and when the plane of single rotating mass lies at one end of the planes of balancing masses. Balancing of several masses rotating in the same plane. Balancing of several masses rotating in different planes.
- CH 1669 (II) Balancing (Reciprocating Masses): Reciprocating engine mechanism, primary balancing of unbalanced primary force in a reciprocating engine, reciprocating engine mechanism, primary & secondary forces, balancing of v-engines.

VII. Theory of Machines Charts



CH 3145
DRAWING OF UTM (MACHINE & SAMPLES)

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- CH 1670 (I)a Vibration (Longitudinal & Transverse-I): Types of free vibration, natural frequency of free longitudinal, transverse vibrations. Effect of inertia of the constraint in longitudinal, transverse vibrations.
- CH 1670 (I)b Vibration (Longitudinal & Transverse-II): Simply supported beam with a point load. Shaft carrying a number of point loads, shaft carrying a number of point loads and uniformly distributed load, critical whirling speed of a shaft. Frequency of free damped and under damped forced vibrations. Vibration isolation.
- CH 1670 (II) Vibration (Torsional): Natural frequency of free Torsional and effect of inertia constraint on torsional vibrations, free torsional vibration of a single and tow rotor system. Torsionally equivalent shaft. Free torsional vibrations of geared system.
- CH 1671 (I) Friction (General): Limiting friction, Limiting angle of friction, Angle of repose, Minium force required to slide a body, Body lying on a rough inclined plane motion of the body up the plane neglecting & considering friction and down the plane considering friction.
- CH 1671 (II) Friction (Screw): Screw jack, thrust collar, torque required of lift the load, and to lower the load and friction of a V-thread.
- CH 1671 (III) Friction (Journal Bearing): Friction in journal bearing, Pivot and Collar bearing, flat pivot or foot step bearing, conical trapezoidal pivot bearing, flat collar bearing.
- CH 1671 (IV) Friction (Clutches): Single disc or plate clutch and its forces, cone clutch its friction surfaces as a frustum of a cone.

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VIII. Production Technology Charts

- CH 1619 (I) **Gear:** Horizontal gear shaping machine-principle
- CH 1619 (II) **Gear:** Hobbing process
- CH 1620 (I) **Cutting Tool:** Basic requirements
- CH 1620 (II) **Cutting Tool:** Single point tool
- CH 1620 (III) **Cutting Tool:** Chip formation & formation of continuous chip with a Built-up edge.
- CH 1621 (I) **Bending:**
Principles, U-bending dies & Bending tools.
- CH 1621 (II) **Bending:** V - bending dies, Bending radius & Bending forces
- CH 1622 (I) **Drill:** Straight shank & oil hole
- CH 1622 (II) **Drill:** Drill parts
- CH 1623 **Counter:** Types of counter bore, Counter sinking & Counter drilling
- CH 1624 (I) **Chip:**
Types of chip breakers & Chisel edge angle
- CH 1624 (II) **Chip:** Automatic back spot facer
- CH 1625 (I) **Gauges:** Types of gauges
- CH 1625 (II) **Gauges:** Gauge tolerances
- CH 1625 (III) **Gauges:** Gauge components
- CH 1626 (I) **Millings:** Cutters terminology
- CH 1626 (II) **Millings:** Broaching tools
- CH 1626 (III, IV & V) **Millings:** Cutters
- CH 3155a **Elements of Jigs and Fixtures -I** (Locating Devices)
- CH 3155b **Elements of Jigs and Fixtures -II** (Locating Devices)
- CH 3156a **Elements of jigs and Fixtures -I** (Clamping Devices)
- CH 3156b **Elements of jigs and Fixtures -II** (Clamping Devices)
- CH 3157 **Elements of Jigs and Fixtures** (Indexing Devices)
- CH 3158 **Press Tools**
- CH 3159 **Types of Broaches**
- CH 3160 **Lathe and its Operations**
- WS 134 **Turret Lathe**
- CH 3162 **Turret Indexing Mechanism**
- CH 3163 **Tool Geometry**

VIII. Production Technology Charts

- CH 3164 **Tool layout of Turret Lathe**
- CH 3165 **Shaping Machine** (Construction)
- CH 3166 **Turret Tool holders**
- CH 3167 **Broaching Machine** (Type / Construction)
- CH 3168 **Jig Boring Machine**
- CH 3169 **Superfinishing Processes**
- CH 3170 **Gear Hobbing Machine**
- CH 3171 **Variable Speed Drive**
- CH 3172 **Types of Collets Chuck**
- CH 3173 **Types of Cutter Holder & Work holder**
In Milling Machine
- CH 3174 **Abrasive Jet Machining** (AJM)
- CH 3175 **Electro Chemical Machining** (ECM)
- CH 3176 **Electron Beam Machining** (EBM)
- CH 3177 **Electrical Discharge Machining** (EDM)
- CH 3178 **Laser Beam Machining** (LBM)
- CH 3179 **Plasma Arc Machining** (PAM)
- CH 3180 **Methods of Metal Cutting**
(Orthogonal / Oblique)
- CH 3181 **Different shapes of Grinding Wheels**
- CH 3182 **Quick Return Mechanism of a Shaper Machine**
- CH 3183 **Broaching Operations**
- CH 3184 **Parts of Standard Shaper**
- CH 3185 **Sensitive & Vertical Drilling Machine**
- CH 3186 **Radial Drilling Machine**



CH 3172
TYPES OF COLLETS CHUCK

IX. Metrology Quality Control Charts

- CH 3200 **Standards of Measurements & Methods of Measurement**
- CH 3201 **Non Precision Measuring tools**
- CH 3202 **Surface Plates, Beam comparator, Spirit Levels & Combination set.**
- CH 3203 **Universal Surface Gauge & Engineer's Square.**
- CH 3204 **Vernier Caliper & Types of vernier caliper.**
- CH 3205 **Types of Micrometer.**
- CH 3206 **Slip Gauges.**
- CH 3207 **Plain Plug Gauges, Snap & Limit.**
- CH 3208 **Type of Comparator**
- CH 3209 **Mechanical optical, Electro-Mechanical & Pneumatic Comparator**
- CH 3210 **Solex pneumatic Gauges & Differential Comparator**
- CH 3211 **Geometric Characteristics & Symbol**
- CH 3212 **Types of Bevel Protectors**
- CH 3213 **Types Auto collimator**
- CH 3214 **Manufacturing Process & Expected values of Roughness.**
- CH 3215 **Dial Gauge Indicator, Applications.**
- WS 155a **Measurement of Threads-I**
- WS 155b **Measurement of Threads-II**
- CH 3217 **Thread Gauges**
- CH 3218 **Gear Tooth Measurement**
- CH 3219 **Spur Gear Testes**
- CH 3220 **Measurement of Gears using Gratings**
- CH 3221 **Surface Roughness measurement**
- CH 3222 **Spur Gear Terminology**

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X. Advance Manufacturing Tech./ Process Charts

- CH 3174 Abrasive Jet Machining (AJM)
- CH 3175 Electro Chemical Machining (ECM)
- CH 3176 Electron Beam Machining (EBM)
- CH 3177 Electrical Discharge Machining (EDM)
- CH 3178 Laser Beam Machining (LBM)
- CH 3179 Plasma Arc Machining (PAM)

XI CAD / CAM Charts

- CH 3255 Hierchy of computer in Manufacturing
- CH 3256 Computer network structures
- CH 3257 Computer integrated production planning & control system
- CH 3258 Computer integrated production management system.
- CH 3259 Computer Aided Process Planning
- CH 3260 Robot Technology
- CH 3261 Computer-Process Control
- CH 3262 CNC Turning
- CH 3263 CNC Milling
- CH 3117 Basics commands of Auto CAD
- CH 3118 Basics commands of Pro-E
- CH 3119 Basics commands of CAM

XII. Fluids Machines & Hydraulics Charts

- CH 1655 **Pressure Measuring Devices:** Relationship; Simple Manometer: Piezometer, U- tube (for gauge & vaccum pressure) and single column manometer - vertical & inclined, Differential Manometer: U-tube differential & inverted U-Tube differential
- CH 1656 (I) **Impulse Turbine (Tangential Flow):** Layout of a hydroelectric power plant, nozzle with a spear to regulate flow, Pelton turbine, Governing of pelton turbine & Runner of Pelton wheel.
- CH 1656 (II) **Reaction Turbine (Radial & Axial Flow):**
- CH 1656 (III) Kaplan Turbine
- CH 1656 (IV) Francis Turbine
- CH 1656 (V) Pelton turbine Setup
- CH 1657 (I) **Fluid System:** (Principles of fluid statics & kinematics)
Hydraulic press, Actual Hyd. Press, Hyd. Accumulator, Differential Hyd. Accumulator.
- CH 1657 (II) **Fluid System:** (Principles of fluid statics & kinematics)
Hyd. Intensifier, Hyd. Ram & Hyd. Lift
- CH 1657 (III) **Fluid System:**
(Principles of fluid statics & kinematics)
Hyd. Crane, Hyd. Coupling, Hyd. Torque Converter



**CH 3260
ROBOT TECHNOLOGY**

Ask for Big Sized 30X40" Laminated Dbios Charts

- CH 1658 **Orifices & Mouthpieces:**
- CH 1658A Orifice Meter setup
- CH 1659 **Notches & Weirs:**
Notches: Rectangular, Triangular, Trapezoidal & Stepped.
Weirs: Cipolletti, Broad crested, An Oogee & submerged.
- CH 1660 **Flow In Channels (Open):** Uniform & non-uniform flow and uniform flow in open channel, specific energy and its curve, Hydraulic jump, Backwater curve and affux & its length.
- CH 1661 **Flow Through Pipes (Minor energy losses):**
- CH 1661 (A) Pipe flow analysis
- CH 1662 **Pumps (Centrifugal):**
- CH 1662 (A) Variable Speed Centrifugal pump setup
- CH 1663 **Pumps (Reciprocating):**
- CH 3232 Various Types of Pump (Gear Pump)
- CH 3233 **Types of Acting Cylinder**
- CH 3234 **Pneumatic Tools**
- CH 3235 **Directional control valve**
- CH 3236 **Comparison of Seat Valves , Types of Spool & Seat Valves**
- CH 3237 **Types of Flow Control Valve**
- CH 3238 **Impulse Generator**
- CH 3239 **Pilot Operated Directional Control Valve**
- CH 3240 **Solenoid Operated valve**
- CH 3241 **Rotameter**
- CH 3242 **Submersible pump**
- CH 3243 **Venturimeter**

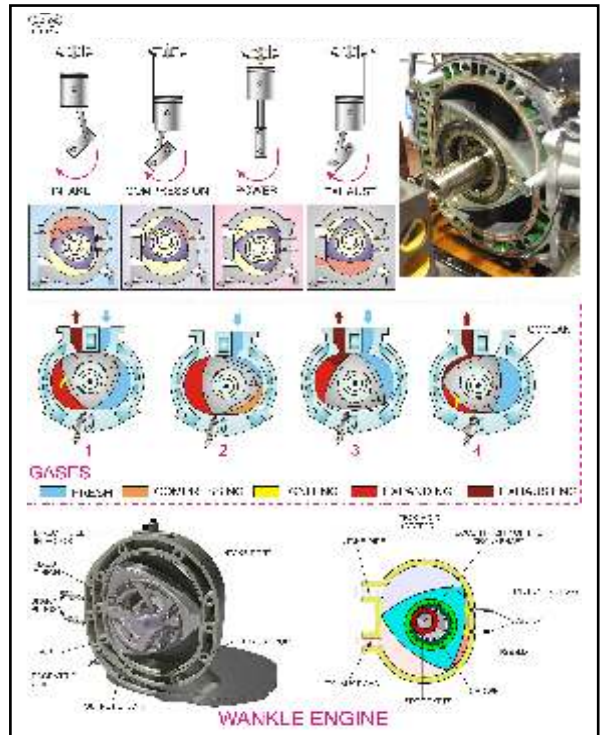
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XIII. Therodynamics / Thermal Charts

HEAT & THERMODYNAMICS

- CH 3269 Lancashire boiler
- CH 3270 Babcock and Wilcox Boiler
- CH 3271 Loeffler Boiler
- CH 3272 Velox Boiler
- CH 3273 Green's Economiser
- CH 3274 Jet Condensers
- CH 3275 Surface Condensers
- CH 3276 Separating Calorimeter
- CH 3277 Throttling Calorimeter
- CH 3278 Combined Separating and throttling Calorimeter
- CH 3279 Mollier Diagram
- CH 3280a Different types of Cycles-I
- CH 3280b Different types of Cycles-II
- CH 3281 Heat pump
- CH 3282 Wankle Engine With Cycle
- WS 31 Spark Plug
- CH 3284 Stirling Engine
- CH 3285 Compressors (Reciprocating and rotary)



**CH 3282
 WANKLE ENGINE WITH CYCLE**

XIV. RAC Charts

- CH 1601 Main Refrigerant Lines for refrigeration system
- CH 1602 Basic vapour compression refrigeration system
- CH 1603 Use of an oil separator in a refrigeration system
- CH 1604 Refrigeration compressors:
 Reciprocating, Rotary, Helical (screw) & Centrifugal
- CH 1605 Compression cycle in a rotary compressor
- CH 1606 Single acting reciprocating compressor:
 Piston at top of cylinder, down stroke, piston at bottom of cylinder & Upstroke
- CH 1607 Air cooled condenser
- CH 1608 Evaporative condenser:
 Counter flow draw-through type & Below-through type
- CH 1609 Water-cooled condenser
 Shell and coil & Tube in tube
- CH 1610 Multiple evaporator system with a central accumulator
- CH 1611 Oil skimmer on flooded shell and tube evaporator
- CH 1612 Spring loaded pressure relief valves
- CH 1613 Types of mechanical draft cooling towers
- CH 1614 Atomospheric natural draft cooling tower
 Splash Deck type and Spray Type
- CH 1615 Natural Draft Cooling Tower- Hyperbolic Cross Flow Type
- CH 1616 Psychometric Chart
- CH 1618 Refrigerant Conditions in Typical A.C. Unit.
- CH 3321 Layout of Ice Plant
- CH 3322 Steam Jet Refrigeration
- CH 3323 Vortex tube Refrigeration
- CH 3324 Desert Cooler & Water Cooler
- CH 3325 Types of Compressors
- CH 3326 Indirect Refrigeration System
- CH 3327 Evaporating Cooling
- CH 3328 Hermetic Sealed Compressor
- CH 3329 Constant Pressure Expansion valve
- WS 25 Two Stroke Cycle
- WS 26 Four Stroke Cycle
- WS 31 Spark Ignition (2 Stroke/4 Stroke)
- CH 3298 Fuel Injection Systems

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XV. Internal Combustion Engine Charts

- CH 3299 Fuel Ignition Systems
- CH 3300 Types of Carburetor
- CH 3301 Combustion Chamber
- CH 3282 Wankle Engine with Cycle
- CH 3303 Types of Lubricator
- CH 3304 Bomb Calorimeter
- CH 3305 Types of Calorimeter
- CH 3306 Flash & Fire point apparatus
- CH 3307 Working of Car Compressor
- CH 3308 Gas Turbine Plant
- CH 3309 Cooling System in Automobile
- CH 3310 Exhaust System
- CH 3311 Catalytic Converter

XVI. Heat Transfer Section Charts

- CH 3341 Thermal Conductivity of Insulating Powder
- CH 3342 Two Slab Guarded Hot Plate apparatus
- CH 3343 Heat Transfer in Natural Convection
- CH 3344 Heat Transfer in Forced Convection
- CH 3345 Extended Surfaces
- CH 3346 Stefan Boltzman Apparatus
- CH 3347 Types of Heat Exchanger
- CH 3348 Shell & Tube Heat Exchanger
- CH 3349 Pool Boiling Phenomenon
- CH 3350 Heat pipe
- CH 3351 Thermal Conductivity of Metal Bar
- CH 3352 Heat Transfer in Condensation
- CH 3353 Properties of Air
- CH 3354 Properties of Saturated Water
- CH 3356 Heat Exchange Equipment

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XVII. Renewable Source Charts

- CH 3410 Plant Layout from waste
- CH 3411 Fuel Generation from Garbage
- CH 3412 Energy sources
- CH 3413 Renewable Energy Resources
- CH 3414 Comparison chart for renewable energies.
- CH 3415 Biomass renewable energy
- CH 3416 Hydropower renewable energy
- CH 3417 Wind power renewable energy
- CH 3418 Geothermal renewable energy
- CH 3419 Solar renewable energy

XIX. Rapid Prototyping Charts

- CH 3431 Stereo Lithography (SLA)
- CH 3432 Fused Deposition Modelling (FDM)
- CH 3433 Laminated Object Manufacturing (LOM)
- CH 3434 Selective Laser Sintering (SLS)
- CH 3435 Solid Ground Curing (SGC)
- CH 3436 Ballistic Particle Manufacturing (BPM)
- CH 3437 Three Dimensional Printing (3DP)
- CH 3438 Laser Powder Forming (LPF)
- CH 3439 Inkjet-based Technologies (IBT)
- CH 3440 Comparison chart of Rapid prototyping processes
- CH 3441 Classification of Metal Rapid Prototyping Technology
- CH 3442 Classification of Metal Rapid Prototyping

XX. Non Destructive Testing Charts

- CH 3400 Ultrasonic Testing
- CH 3401 Magnetic particle testing
- CH 3402 Liquid Penetration Testing
- CH 3403 Radiographic
- CH 3404 Eddy-current Testing

XXI. Fibre Reinforced Plastics Charts

- CH 3445 Applications of Fibre Reinforced Plastics
- CH 3446 Different processes of FRP (set of 5Pc)

XVIII. Automobiles Charts

- CH 1627 Differential
- CH 1628 Single Plate Clutch
- CH 1629 Hydraulic Brake Layout
- CH 1630 Wheel Alignment
- CH 1631 Fuel Feed Pump Petrol
- CH 1632 Electric Fuel Feed Pump
- CH 1671 (I) Friction (General):
- CH 1671 (II) Friction (Screw):
- CH 1671 (III) Friction (Journal Bearing):
- CH 1671 (IV) Friction (Clutches):
- CH 3371 Multi Cylinder Petrol Engine
- CH 3372 Multi Cylinder Diesel Engine
- CH 3373 Types of Air Filter
- CH 3374 The Ferlec Electro-Magnetic Clutch
- CH 3375 Principle of Centrifugal Clutch
- CH 3376 Multiple plate clutch
- CH 3377 Diaphragm Spring Clutch
- CH 3378 Coil-Spring Clutch
- CH 3379 Internal Expanding Brake System
- CH 3380 Disc Brake
- CH 3381 Master Cylinder
- CH 3382 Power Operated Brakes
- CH 3383 Dual Power operated Brake System
- CH 3384 Details of Generator Cum Alternator
- CH 3385 Power Transmission Line Layout
- WS 31 Spark Plug
- CH 3387 Shock Absorber
- CH 3388 Types of Lubricating Pump
- CH 3389 Automobile Lighting system
- CH 3390 Automobile Electrical circuit

Big Sized 30X40" Laminated Dbios Charts

XVIII. Automobiles Charts

- AE 1. Auto-electrical Symbols
- AE 2. Automotive Electrical Wiring Diagram - Diesel Engine
- AE 3. Self Starter
- AE 4. Specification of MPFI Vehicles - I
- AE 5. Specification of MPFI Vehicles - II
- AE 6. Electrical Wiring Diagram - Carburetor
- AE 7. Emission Control Systems CRDI
- AE 8. DECI & A/C Control Systems
- AE 9. Automatic Transmission
- AE 10. Clutch Systems
- AE 11. Electric Shift Control Systems
- AE 12. Manual Transmissions
- AE 13. Transmission Assembly
- AE 14. Built-up of Bus Body Coach
- AE 15. Electronic Multi-point Fuel injection System
- AE 16. Terminal Arrangement of ECM
- AE 17. Throttle Body EFI Systems
- AE 18. Automotive Lightning Systems
- AE 19. Automotive Accessories - I
- AE 20. Automotive Accessories - II
- AE 21. Anti-braking Locking Systems (ABS)
- AE 22. Ac Gas Charging Systems
- AE 23. Defects - Diagnostics & DTC
- AE 24. New Age Car Systems
- AE 25. Vehicle Specifications - I
- AE 26. Vehicle Specifications - II
- AE 27. Vehicle Specifications - III
- AE 28. Vehicle Specifications - IV
- AE 29. Vehicle Specifications - V
- AE 30. Vehicle Specifications - VI
- AE 31. Vehicle Specifications - VII
- AE 32. Vehicle Specifications - VIII
- AE 33. Tools & Equipments Required In Workshops - I
- AE 34. Tools & Equipments Required In Workshops - II
- AE 35. Tools & Equipments Required In Workshops - Iii
- AE 36. Tools & Equipments Required In Workshops - Iv
- AE 37. Front Axle Suspension Systems
- AE 38. Exploded View of Engine
- AE 39. R R Door Lockmechanism & Fitment
- AE 40. Body Dimensions
- AE 41. Suspension Systems - Double Wishbone Type
- AE 42. Anti-corrosion Compound Procedures
- AE 43. Central Locking Systems
- AE 44. Braking Systems
- AE 45. Windshield Fitment Procedures
- AE 46. ABS Systems
- AE 47. Vehicle Identification
- AE 48. Types Constructional View
- AE 49. Undercoating Application Areas
- AE 51. Differential And Rear Axle
- AE 52. Piston And Connecting-rod
- AE 53. Front-drive Axle
- AE 54. Cautionary Signs
- AE 55. Layout of The Complete Brake System On An Automobile
- AE 56. Steering System
- AE 57. Points of A Car
- AE 58. Differential
- AE 59. Rack-and-pinion Steering Gear Showing Linkages to The Wheel Spindles
- AE 60. Worm And Roller Steering Gear
- AE 61. Simplified Pitman-arm Steering System
- AE 62. Simplified Rack-and-pinion Steering System
- AE 63. Construction of A Car Wheel (American Motors)
- AE 64. Disassembled Coil-spring Clutch (chrysler Corporation)
- AE 65. Two Wheelers
- AE 66. Bike Parts
- AE 67. Two Wheeler Electrical Wiring

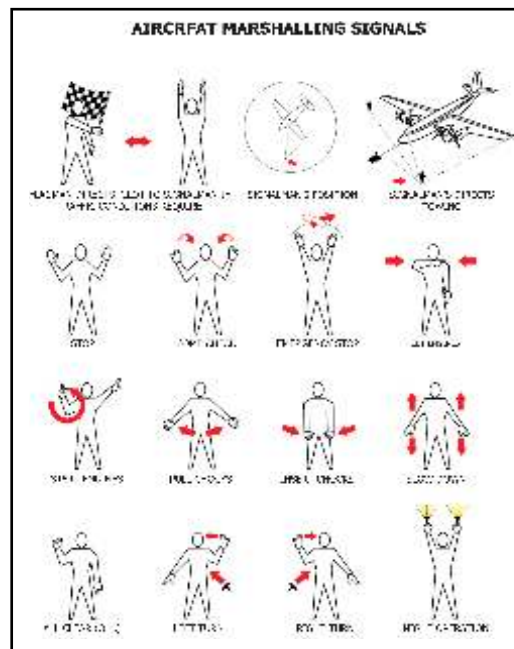
Ask for Big Sized 30X40" Laminated Dbios Charts

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Thick Laminated & Framed on NU-Wood Board

Size 20"x26"

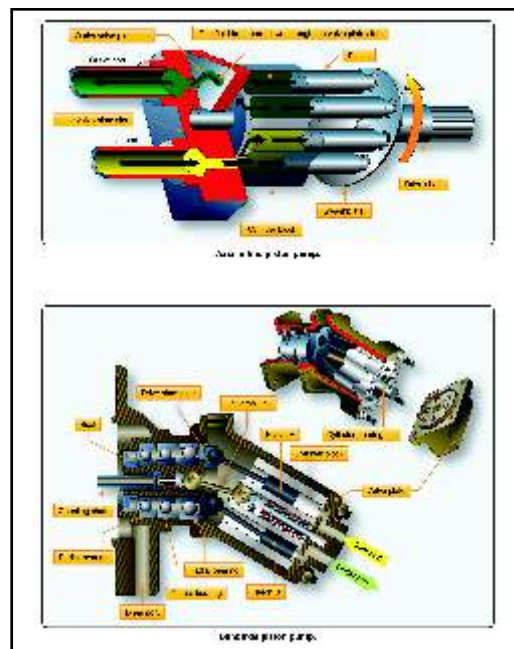
XXII. Aircraft Charts

- S-20 Aircraft Marshalling Signals
- S-21 Engine Start Precautions
- S-22 Jacking Precautions
- S-23 Fire Safety Precautions
- S-24 Safety Precautions Entering a Cockpit and Landing Gear Servicing
- S-25 Safety Precautions for APU Starting
- S-26 Safety precautions to be followed in Hangar
- S-27 Battery Installations & Removal Precautions
- S-28 Hawker HS 125-700 (Basic Information)
- Air 01 Fuel Assembly
- Air 02 Parts of Aircraft Engine
- Air 03 Propeller Blade
- Air 04 Electronic Engine Control System
- Air 05 Pressure Regulated lubricating system
- Air 06 Propeller Control System
- Air 07 Kidde continuous loop system
- Air 08 Electronic Engine Control Programing plug
- Air 09 Engine oil Flow System
- Air 10 Hydraulic System
- Air 11 Reservoir
- Air 12 Gear Type power pump
- Air 13 Piston pump
- Air 14 Flow control valve (Pressure controlled & Mechanically operated valve)
- Air 15 Flow control valve (Hydraulic & Pressure Relief valve)
- Air 16 Pressure control valve
- Air 17 Pneumatic system
- Air 18 Arrangement of Gas Turbine Engines
- Air 19 Working Cycle of a Turbo jet Engine
- Air 20 Combustion chamber
- Air 21 Arrangement of Accessories Drives & Blades
- Air 22 Engine Lubrication System
- Air 23 Fuel system for turbo-jet Engines
- Air 24 Ignition and Lightening Unit
- Air 25 Cooling and Ventilation System
- Air 26 Fuel Injection system
- Air 27 Speed Condition
- Air 28 Governor
- Air 29 Electric system
- Air 30 Position of Propeller (Balance Check)
- Air 31 Propeller Control system
- Air 32 Propeller Installation
- Air 33 Navigation system / Magnetic compass
- Air 34 Generator
- Air 35 Ground power unit
- Air 36 Aircraft Electric system
- Air 37 Battery circuit system
- Air 38 Automatic Flight control system
- Air 39 Auto Pilot system
- Air 40 Pitot -Static Sensing Devices
- Air 41 Pitot-static System
- Air 42 Pump Driven vacuum system
- Air 43 Hydraulic Gear Retraction system
- Air 44 Brakes system
- Air 45 Hydaulic Nose Wheel steering System
- Air 46 Landing Gear
- Air 47 Power Brake system
- Air 48 Air Conditioning & Cabin heating System
- Air 49 Oxy flow system
- Air 50 Chemical deicing system
- Air 51 Chemical oxygen generator & oxygen flow system for cabin
- Air 52 Blower assembly
- Air 53 Air cycle machine & Pneumatic cabin pressure regulator
- Air 54 Large aircraft hydraulic systems



S-20

AIRCRAFT MARSHALLING SIGNALS



Air 13 PISTON PUMP

VI. Industrial Automation

- IA 1 Flow control valves
- IA 2 Cylinders and Air motors
- IA 3 Fluidic elements
- IA 4 Robotic arm configuration
- IA 5 Robotic end effectors.
- IA 6 Symbols of Hydraulic and pneumatic circuits.
- IA 7 Fluids in Power Generation

In our Continuous pursuit to unrivaled quality Dbios, now join Hands and Heads with Ambros to cater your Laboratory/Workshop needs under one roof.



DM 110
DISSECTED MODELS on SOLIDS



DM 251
4 STROKE PETROL ENGINE



DM 125
DIFFERENT TYPES OF NUTS

1st Time in India Dbios Introduces Fibre Glass Drawing Models. Unbreakable Fiber Glass is used to make it more Sturdy & beautiful

ENGINEERING MODELS

DM 100 DISSECTED MODELS on DRAWING (set of 14)
Cube, Cone, Sphere & Cylinder
Prism & Pyramid {Rectangular, Triangular Square, Pentagonal & Hexagonal}.

DM 105 NON-DISSECTED MODELS on DRAWING (set of 18)
Cube, Cone, Hemi-sphere, Sphere, Tetrahedron, Octahedron, Semi-Cylinder & Cylinder.
Prism & Pyramid {Rectangular, Triangular Square, Pentagonal & Hexagonal}.

DM 115 INTERSECTION of SOLIDS (set of 10)
Two Cylinders at Right angles; A cylinder into cone. Two Cylinders with oblique penetration. A cone & cylinder penetrating at right angles A cylinder into cone at right angles. Two cones at right angles, Sphere & cone at centre. Two square prisms at oblique angles. Sphere & Cone At eccentric, Sphere & cylinder at centre.

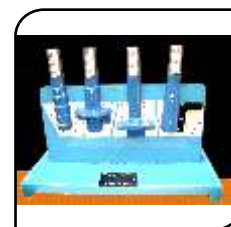
MODELS on NUTS & BOLTS

DM 125 Different types of NUTS (set of 10)
Hexagonal, Square, Flanged, Cap, Dome, Ring, Wing, Capstan & Cylindrical Nuts.

DM 130 Different types of BOLT HEADS (set of 8)
Hex, Square, Round, Cheese, Flat, Pan, Oval & Flister.

DM 131 Foundation Bolts

DM 135 Different types of THREADS (set of 8)
Triangular or 'V', Square, Whitworth, Metric, Acme, Metric Trapezoidal, Knuckle and Buttruss Threads.



DM 131

SECTIONAL WORKING MODELS on PETROL & DIESEL ENGINE

DM 250 2 Stroke Petrol Engine
DM 251 4 Stroke Petrol Engine

DM 252 2 Stroke Diesel Engine
DM 253 4 Stroke Diesel Engine

BELT PULLEY MODELS

DM 9225 Model of Belt Pulleys
(i) Flat Belt Pulley
(ii) Rope Pulley
(ii) V' Belt Pulley
(iv) Cone or Step Pulley

DM 9226 Belt Drive Single Speed
DM 9227 Belt Drive Two Stage
DM 9228 Belt Drive Lose And Fast



DM 9225 (i)



DM 9225 (ii)



DM 9225 (iii)

CAM & FOLLOWER MODELS

DM 9200 CAMS & Followers Set of 5 :-
(i) Plate CAM : With Flat Faced Reciprocating Follower
(ii) Tangent CAM : With Roller Oscillating Follower

(iii) Cylindrical CAM : With Translating Follower
(iv) Translating CAM : With Reciprocating Knife Edge Follower

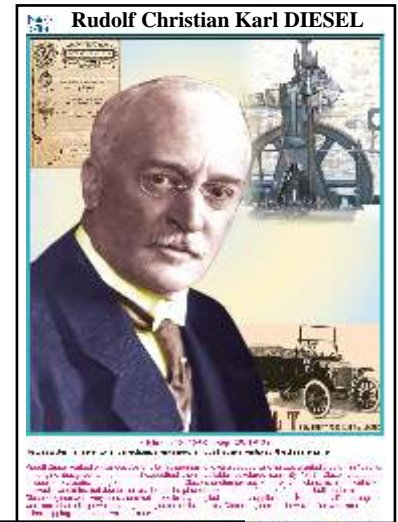
(v) End CAM : With Translating Follower
DM 9201 Action Of CAMS
DM 9202 Triangular Eccentric CAM
DM 9203 Tri Clover Leaf CAM
DM 9204 Harmonic Motion (simple type)
DM 9205 Harmonic Motion

Dbios Pioneers of Mechanical Engineering

Laminated & Framed on NU-Wood Board

Small size 12"x18" Big size 20"x26"

DME 1	James Watt (Father of Mechanical Engineering)	DME 24	Osborne Reynolds
DME 2	Lord Vishwakarma	DME 25	James B. Francis
DME 3	Lord Brahma	DME 26	Nicolas Léonard Sadi Carnot
DME 4	Rudolph Diesel	DME 27	Evangelista Torricell
DME 5	Kelvin	DME 28	Henry maudslay
DME 6	Aryabhata	DME 29	Allen De Vilbiss
DME 7	Taylor	SP 13	Galileo Galilei
DME 8	WrightBrothers	SP 14	Issac Newton
DME 9	George Stephenson	SP 15	C. V. Raman
DME 10	Nicholes Otto	SP 16	H.J. Bhabha
DME 13	Dunlop	SP 20	Archimedes
DME 15	J. M. Juran	SP 23	Albert Einstein
DME 17	Rober Boyle	SP 44	Dr. A. P. J. Abdul Kalam
DME 18	Benjamin Franklin	SP 45	Anton Van leeuwenhoek
DME 19	M. Visvesvaraya	SP 46	Thomas Alva Edison
DME 20	E. Sreedharan	SC 27	Gilbert Newton Lewis
DME 21	Claude-Louis Navier and George Gabriel Stokes	DE 04	Alexander Graham Bell
DME 22	Ludwig Prandtl,	DE 11	Max Plank
DME 23	Theodore von Karman		



20"x26"
DME 4
Rudolph Diesel



12"x18"
DME 8 Wright Brothers

