GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

COMPETENCY BASED CURRICULUM

MECHANIC ELECTRIC VEHICLE

(Duration: Two Years)
Revised in July 2022

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 4

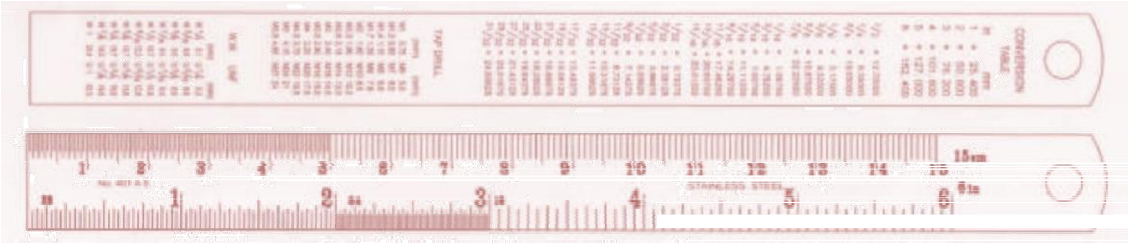
SECTOR – AUTOMOTIVE

Directorate General of Training

TABLE OF CONTENTS

1. Steel Rule

1.1Basic Indicative diagram



1.2 Material Stainless Steel
1.3 Thickness:0.5mm
1.4 Hardness:30-35HRC(SpeciallyHardened)
1.5 Finish Polished 2B/ Anti-Glare Satin Chrome
1.6 Surface roughness:0.6Microns max.
1.7 Range:150mmScale
1.8 Measuringl east count:Metric Graduation +0.5 mm and English graduation 1/64 inch
1.9 Accuracy:Metrology Standard EEC Class-I

Source: Specification for mechanical measuring equipments group items-version3--2018-19 sr.no-31 pageno 34

2. Hand Gloves

2.1 Basic Indicative Diagram

2.2 Basic Indicative Diagram
2.3 Material-made from split or top leather
2.3 Brightly coloured for high visibility
2.4 Length:13.5to14inches
2.5 Lining inside

Source: Speifications from safety equipments item no. 3page no .4 Version 3 2018 - 19

3. Safety Shoes

3.1Basic Indicative Diagram

3.2 Compliance:Generally Conforming to IS-152

3.3 Size:UK7,UK8 and UK9

3.4 Genuine full grain leather barton print

3.5 Steel toe as per IS 15298&EN20345 Standards

3.6 Red mesh breathable lining

3.7 Synthetic PU Crespy Black Collar with Extra Cushioning

3.8 Moulded full socks

3.9 Direct injected light weight PU sole

3.10 Antistatic & slip resistant

Source : Specifications from Safety equipments group Version 3 2018 – 19 item no. 9 page no.7

4. Helmet

4.1 Basic Indicative Diagram

4.2 Made from polypropylene material (PPCT).
4.3 Should be provided with gear system
4.4 Should be provided with foam for absorbing sweat
4.5 Shouldbeprovidedwithventilation
4.6 Should be provided with nylon strap
4.7 Should be made from all virgin material
4.8 CE approved
4.9 Color: Yellow

Source : Specifications from Safety equipments group Version 3 2018 – 19 item no. 8 page no.6

5. V Block

5.1 BasicIndicativeDiagram

5.2 Material : IS-2949-1992 Alloysteel
5.3 Total Length: 70mm ± 1mm
5.4 Total Width.: 100mm ± 0.2mm
5.5 Total Height: 100 mm ± 0.2mm
5.6 Angle : 90 Degree
5.7 Vee run out : 10u
5.8 Clamping capacity: 25cm
5.9 Hardness : HRC
5.10 Accuracy : 4µm or better
5.11 Material should be resistant to corrosion,impact and breakage
5.12 Clamp:Material–cast Iron,c type with M12 Threaded Screw

Source: Specification for fitter trade item no.36

Specification for trade-mechanic electric vehcile level-iv regional office Aurangabad.

6. V Block

6.1 Basic Indicative Diagram

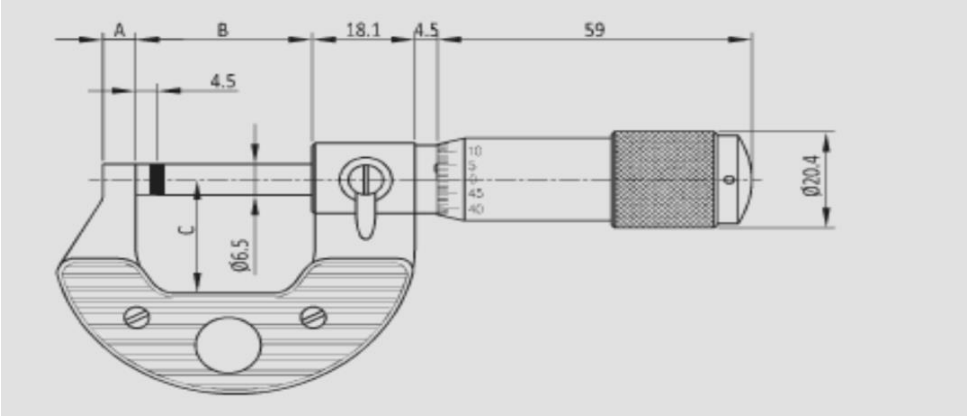
6.2 Material IS-2949-1992Alloy steel
6.3 Total Length: 150 mm ± 1mm
6.4 Total Width:100 mm ± 0.2mm
6.5 Total Height: 100 mm ± 0.2mm
6.6 Angle: 90 Degree
6.7 Veerun out: 10µ
6.8 Clamping capacity: 25mm
6.9 Hardness: 55 HRC
6.10 Accuracy : 4µm or better
6.11 Material should be resistant to corrosion, impact and breakage
6.12 Clamp:Material–cast Iron,C type with M12 Threaded Screw

Source: Specification for fitter trade item no.36

Specification for trade-mechanic electric vehcile level-iv regional office Aurangabad.

7. Micrometer outside

7.1 Basic Indicative Diagram:



7.2 Compliance: Generally Compliant to IS2967/193826.3

7.3 Range: 50mm-75mm

7.4 Reading: 0.01mm26.5Accuracy:4m

7.5 Spindle Material:Stainless Steel/AlloySteel

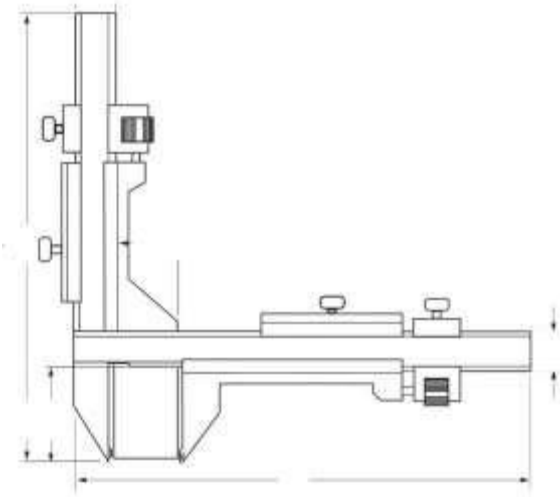
7.6 StandardAccessories:

- 7.6.1 Suitable spanner
- 7.6.2 Distance Piece
- 7.6.3 Wooden/PlasticBox with proper cushioning
- 7.6.4 Operating Manual

Source: Specifications from Mechanical Measuring Equipments group items . Item no.55 page no.58 ver 3 2018-19

8. Vernier Caliper

8.1 Basic Indicative Diagram



8.2 Basic Indicative Diagram

8.2 Gear Tooth - 150 mm

8.3 LC = 0.02 mm

8.4 Resolution: 0.01 mm

8.5 Material: Stainless Steel

8.6 Should have carbide tips

8.7 Range: 1 to 25 mm

8.8 Accuracy: + 0.04 mm

8.9 Length arm 1: 170 + 1%

8.10 Length arm 2: 165 + 1%

8.11 Should be supplied with data output cable

8.12 Standard Accessories

8.13 Operating Manual

8.14 Wooden / Plastic Box with proper cushioning

Source: Specifications from Mechanical Measuring Equipments group items. Item no.62 page no.65 ver 3 2018-19

Specification for trade-mechanic electric vehcile level-iv regional office Aurangabad

9. Micrometer Inside

9.1 Basic Indicative diagram

9.2 Generally conforming to DIN 863, part 4

9.3 Display Type: Analog / Digital

9.4 Range: 20 to 25 mm

9.5 Accuracy: 0.004 mm

9.6 Depth: 66 mm (Required Extension Rod)

9.7 Setting Ring: 20 mm

9.8 Graduation: 0.005 mm

9.9 Should have tungsten carbide measuring faces on all 3 point heads

9.10 Blind bore measurement should be possible

9.11 Ratchet stop to ensure consistent measurement

9.12 Should be supplied in Wooden / Plastic Box with proper cushioning

9.13 Certification from appropriate bodies should be supplied with setting ring &micrometer

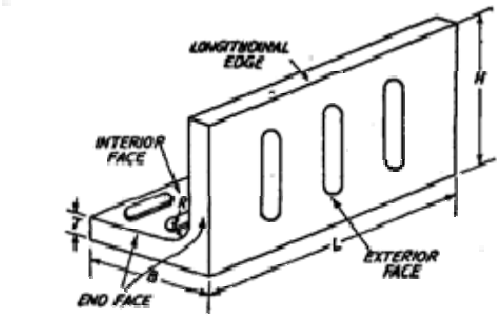
Source: Specifications from Mechanical Measuring Equipments group items. Item no.50 page no.53 ver 3 2018-19

10. Metal L (Metal L 15 cm:These items to be treated as raw material)

11. Metal L (Metal L30 cm: These items to be treated as raw material)

12. Angle plate

12.1 Basic Indicative Diagram



12.2Dimensions:100x20 mm

12.3Length: 200 ± 4mm

12.4 Width: 50 ± 4mm

12.5 Height: 100 ± 4mm

12.6 Body should be made of ductile CastIron

12.7 TiltingAngle: 0-90 degree

12.8 Working face flatness:12 microns per300 mm

12.9 Base of angle should be adjustable and with cutting slot for fixing.

12.10 Slot of plate:M12

12.11 Finish: Micro with Hardness

Source: Specifications for fitter trade item no.37 page no.47

13 Spirit Level

13.1 Basic Indicative Diagram

13.2 Metal frame

13.3 Size:150mm

13.4 Accuracy:0.50mm/meter

13.5 Precision milled base for high accuracy1.14 Have a solid spirit bulb which doesn't break easily.

13.6 The Aluminum frame should be strong and precision extruded which increases Accuracy and strength of theSpirit levels.

13.7Two spirit bulbs to be provided so that it can be used horizontally & vertically

13.8 Rubber molding is provided on the sides of the spirit levels to prevent damage to the Body of the spirit levels.

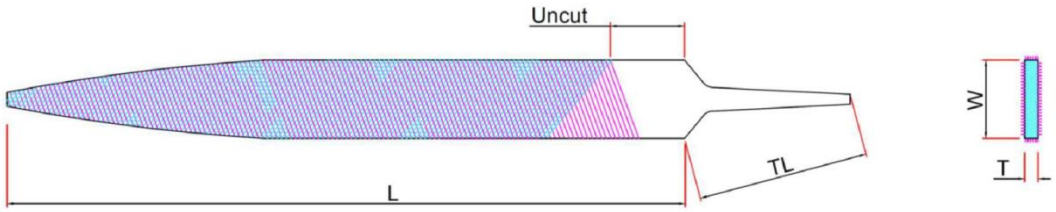
13.9 Magnet should be provided at the base

Source: Specifications for fitter trade item no.21 page no.31

Specification for trade-mechanic electric vehcile level-iv regional office ,Aurangabad.

14. File Warding

14.1 Basic Indicative Diagram

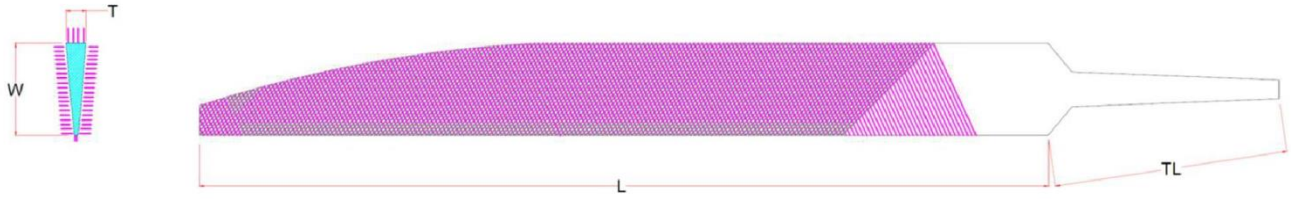


14.2 GenerallyconformingtoIS1931-2000
14.3 BodyLength(L)148152=
14.4 TangLength(TL)505131.5Width(W)15.516.5
14.5 Thickness(T)1.552.25
14.6 No.ofUpcut/Inch5557
14.7 Upcutinclination620680
14.8 No.of Overcut/Inch4748
14.9 OvercutInclination470530
14.10 No.ofEdge cut /Inch5859
14.11 EdgecutInclination870930
14.12 Hardness60HRC64HRC
14.13 RakeAngle-70-120

Source: SpecificationforSource: general handtools–files-item no31

15. File knife edge

15.1Basic Indicative Diagram

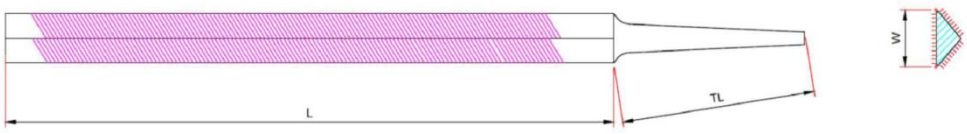


	Range (InMM)	
	From	To
15.1Generally conforming to IS1931-2000		
15.2 Body Length (L)	150	152
15.3 Tang Length (TL)	50	51
15.4 Width (W)	19	19.4
15.5 Thickness (T)	3	4
15.6 No.of Up cut/Inch	53	54
15.7 Up cut inclination	640	660
15.8 No.of Overcut/Inch	46	47
15.9 Over cut Inclination	490	510
15.10 No.of Edge cut /Inch	55	56
15.11 Edge cut Inclination	890	910
15.12 Hardness	60HRC	64HRC
15.13 RakeAngle in deg.	-7	-12

Source: Specification for general handtools–files-item no.16 page no.18 Ver 4 2019-20

16. File Cut saw

16.1Basic Indicative Diagram

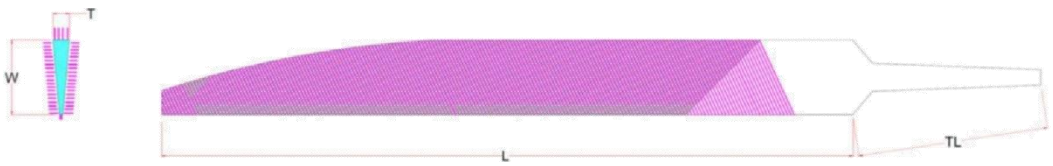


	Range (InMM)	From	To
16.2 Generally conforming to		IS1931-2000	
16.3 Body Length (L)		150	152
16.4 Tang Length (TL)		50	51
16.5 Width(W)		12.4	12.7
16.6 No.of Up cut/Inch		50	51
16.7 Up cu tinclination		640	660
16.8 No.of Edge cut /Inch		58	59
16.9 Edge cut Inclination		890	910
16.10 Hardness		60HRC	64HRC
16.11 Rake Angle in Deg.		-2	-5

Source: Specification for General handtools–files-item no.1, page no.3, Ver4, 2019-2020

17. File feather edge

17.1Basic Indicative Diagram



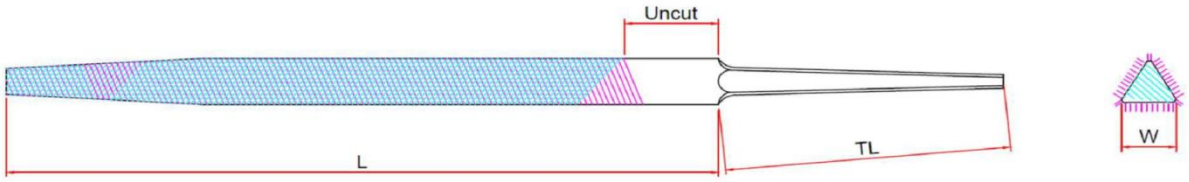
17.2 Smooth

	Range(InMM) From	To
17.3 GenerallyconformingtoIS1931-2000		
17.4 BodyLength(L)	150	152
17.5 TangLength(TL)	50	51
17.6 Width(W)	19	19.4
17.7 Thickness(T)	3	4
17.8 No.ofUpcut/Inch	53	54
17.9 Up cut inclination	64^0	66^0
17.10 No.of Over cut/Inch	46	47
17.11 Over cut Inclination	49^0	51^0
17.12No.of Edge cut/Inch	55	56
17.13 Edge cut Inclination	89^0	91^0
17.14 Hardness	60HRC	64HRC
17.15 Rake Angle	-7^0	-12^0

Source:Specification for fitter trade item no.46 page no.56 VER FT-01,2021-22

18. File-Triangular

18.1Basic Indicative Diagram

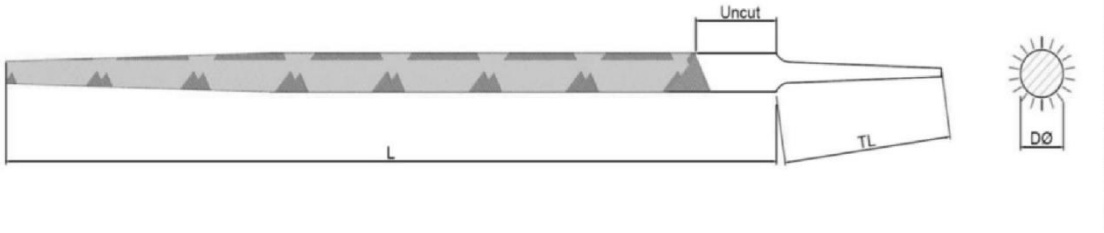


	Range	
18.2 Generally conforming to IS1931-2000	from	to
18.3 Body Length (L)	148	152
18.4 Tang Length (TL)	58	59
18.5 Equilateral Triangle Side(W)	11.05	11.75
18.6 No.of Up cut/Inch	38	39
18.7 No.of Overcut/Inch	33	34
18.8 Up cut inclination	570	630
18.9 No.of Edge cut/Inch	44	45
18.10 Edge cut Inclination	760	780
18.11 Hardness	60HRC	64HRC
18.12 Rake Angle in Deg	-7	-12

Source:Specificatinos for general hand tools–files-item no.29 page no.31, Ver 2019-20

19. File round ECIFICATIONFORTRADE-MECHANICELECTRICVEHCILELEVEL-IVRegionalOfficeAurangabad.

19.1 Basic Indicative Diagram

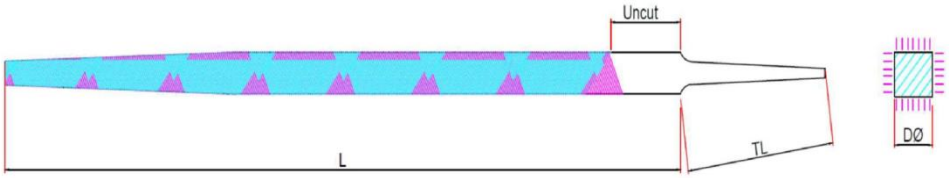


	Range (InMM)	
	From	To
19.2 Generally conforming to IS1931-2000		
19.3 Body Length(L)	198	202
19.4 Tang Length (TL)	55	55
19.5 Diameter (Ø)	6.35	7.25
19.6 No.of Upcut/Inch	31	32
19.7 Up cut inclination	64^0	66^0
19.8 No.of Overcut/Inch	31	32
19.9 Over cut Inclination	49^0	51^0
19.10 Hardness	60HRC	64
19.11 Rake Angle in deg. -7 to -12		
19.12 Second Cut		

Source: Speciifcations for fitter trade item no.48, page no.58, VDER FT-1, 2021-2022

20. File-Square

20.1 Basic Indicative Diagram

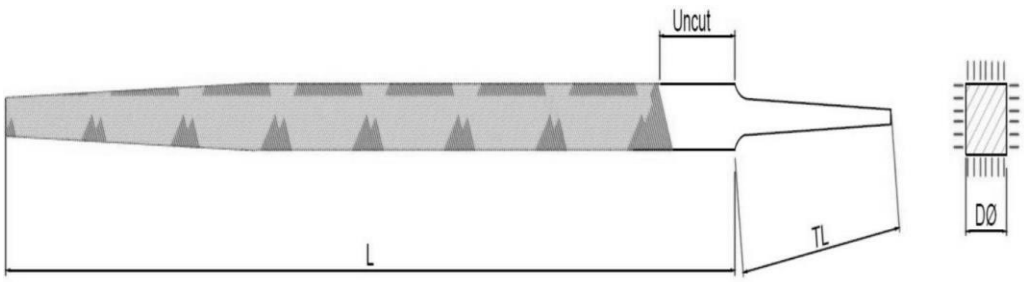


	Range From	To
20.2Second cut		
20.3 Generally conforming to IS1931-2000		
20.4 Body Length (L)	148	152
20.5 Tang Length (TL)	49	51
20.6 Square Side	5.10	6.10
20.7 No.of Upcut/Inch	33	35
20.8 Up cut inclination	650	650
20.9 No.of Overcut/Inch	27	28
20.10 Overcut Inclination	500	500
20.11 Hardness	60HRC	64HRC
20.12 RakeAngle in Deg	-7	-12

Source :Specification for General hand tools, Ver4, 2019-20, Item no. 25 page no.28,

21. File square

21.1Basic Indicative Diagram

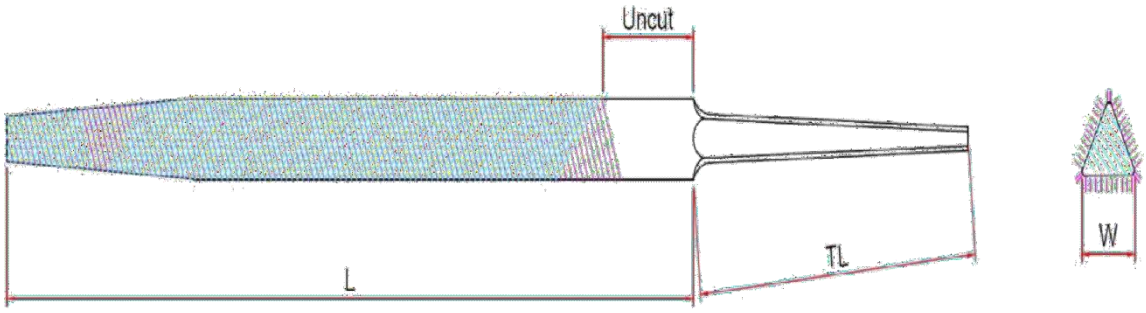


	Range (InMM)	
	From	To
21.2GenerallyconformingtoIS1931-2000		
21.3 Second cut		
21.4 BodyLength(L)	250	254
21.5 TangLength(TL)	55	56
21.6 SquareSide	6.80	7.80
21.6 No.ofUpcut/Inch	37	38
21.7 Upcutinclination	65^0	65^0
21.8 No.ofOvercut/Inch	31	32
21.9 OvercutInclination	50^0	50^0
21.10 EdgecutInclination	89^0	91^0
21.11 Hardness	60HRC	64HRC
21.12 RakeAngle	-7^0	-12^0

Source:Specifications for Fitter Trade item no. 49, page no.59, VER FT-1,2021-2022

22. File Triangular

22.1Basic Indicative Diagram



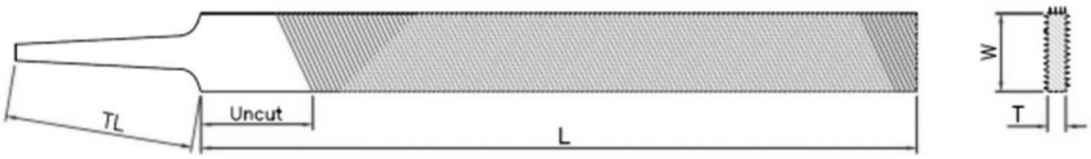
	Range From	To
22.2 Second Cut		
22.3 Generally conforming to IS1931-2000		
22.4 Body Length (L)	194	200
22.5 Tang Length (TL)	58	59
22.6 Equilateral Triangle Side(W)	11.05	11.75
22.7 No.of Upcut/Inch	48^0	49^0
22.8 Up cut inclination	57	63
22.9 No.of Overcut/Inch	38	39
22.10 No.of Edgecut/Inch	51	52
22.11 Edge cut Inclination	76^0	78^0
22.12 Hardness	60 HRC	64HRC
22.13 Rake Angle in Deg	-7	-12

Source: Specification for fitter trade VER FT-01, 2021-2022, item no. 51, page no.61

Specification for trade-mechanic electric vehcile level-iv regional office, Aurangabad

23. File flat

23.1 BasicIndicativeDiagram

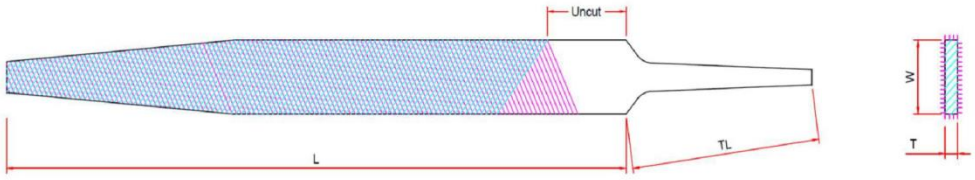


	Range(InMM) From	To
23.2 Generally conforming to IS1931-2000		
23.3 Body Length (L)	294	300
23.4 Tang Length (TL)	54	56
23.5 Width(W)	19.6	20.6
23.6 Thickness (T)	3.7	4.4
23.7 No.of Upcut/Inch	34	35
23.8 Up cu tinclination	64^0	66^0
23.10 No.of Overcut/Inch	29	30
23.11 Overcut Inclination	44^0	46^0
23.12 No.of Edgecut/Inch	36	37
23.13 Edge cut Inclination	89^0	91^0
23.14 Hardness	60HRC	64
23.15 Rake Angle	-7^0	-12^0
23.16 Second Cut		

Source: Specifications for fitter trade VER FT-01,2021-2022, item no 52 page no.62

24.-File Flat

24.1 Basic Indicative Diagram



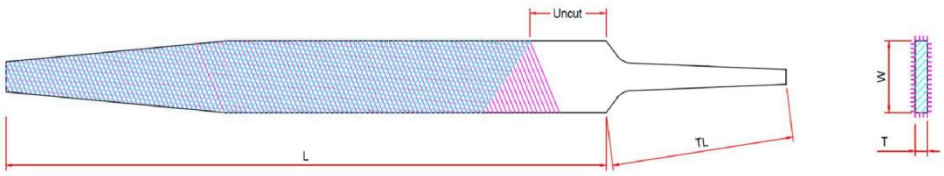
	Range (In MM)	
	From	To
24.2 Batsard		
24.3 Generally conforming to IS 1931-2000		
24.4 Body Length (L)	198	202
24.5 Tang Length (TL)	54	56
24.6 Width (W)	19.6	20.6
24.7 Thickness (T)	3.7	4.4
24.8 No. of Upcut / Inch	24	26
24.9 Up cut inclination	64^0	66^0
24.10 No. of Overcut / Inch	18	20
24.11 Over cut Inclination	44^0	46^0
24.12 No. of Edge cut / Inch	25	27
24.13 Edge cut Inclination	89^0	91^0
24.14 Hardness	60	64
24.15 Performance in 7500 strokes	15hrc	15.5hrc
24.16 Rake Angle	-7^0	-12^0

Source: Specifications for general hand tools, item no.2, page no.4

Specification for trade-mechanic electric vehcile level-iv regional office, Aurangabad.

25. File Flat

25.1 Basic Indicative Diagram



		Range in mm	
		From	To
25.2	Generally conforming to IS 1931-2000		
25.3	Body Length (L)	298	302
25.4	Tang Length (TL)	69	71
25.5	Width (W)	28.9	29.9
25.6	Thickness (T)	5.35	6.05
25.7	No. of Upcut / Inch	15	16
25.8	Upcut inclination	64^0	66^0
25.9	No. of Overcut / Inch	12	13
25.10	Overcut Inclination	44^0	46^0
25.11	No. of Edge cut / Inch	18	19
25.12	Edge cut Inclination	89^0	91^0
25.13	Hardness	60 HRC	64 HRC
25.14	Rake Angle	-7^0	-12^0

Source: Specifications for general handtools–files-item no.3page no.5

26. File Swiss type-Needle-Set of 12

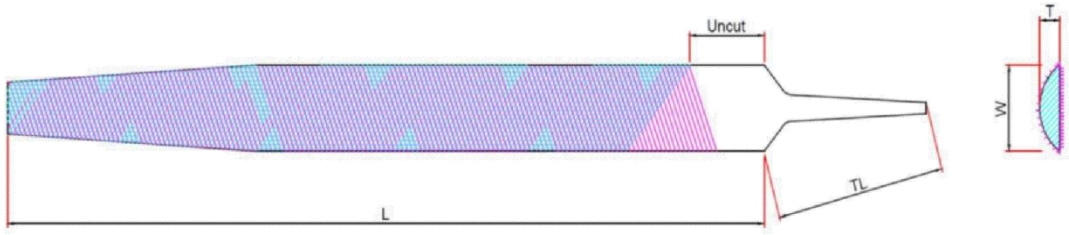
26.1 Basic Indicative Diagram

26.2 Material	*polycarbonate*
26.3 Colour	*Gold, Yellow, Black, Grey*
26.4 Product Dimensions	*30.5L x 5.1W Centimeters*
26.5 Net Quantity	*12 count*

Source: Spefifications prepared by committee

27. File Half Round

27.1 Basic indicative Diagram

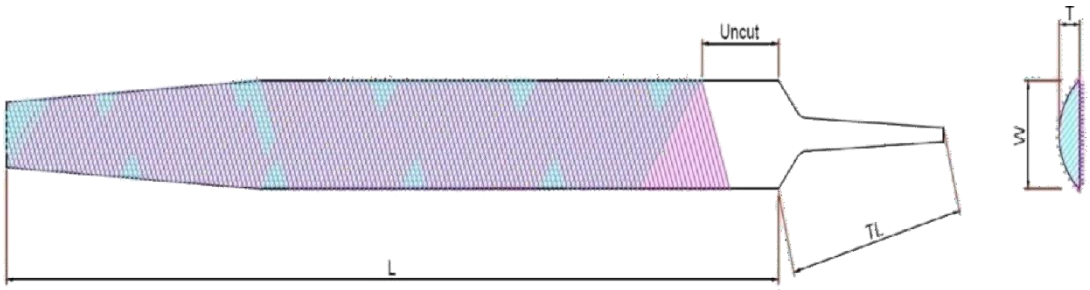


	Range (In MM)	
	From	To
27.2 Second cut		
27.3 Generally conforming to IS1931-2000		
27.4 Body Length(L)	250	252
27.5 Tang Length(TL)	60	61
27.6 Width (W)	23.70	24.7
27.7 Thickness(T)	6.55	7.25
27.8 No.of Up cut/Inch	(29-30F/S)	(28-29R/S)
27.9 Up cut inclination	65^0	65^0
27.10 No.Over cut/Inch	(24-25F/S)	(24-25R/S)
27.11 Over cut Inclination	50^0	50^0
27.12 No.of Edgecut/Inch	28	29
27.13 Edge cut Inclination	65^0	65^0
27.14 Hardness	60HRC	64HRC
27.15 Rake Angle	-7^0	-12^0

Source: Specifications for Fitter Trade VER FT-01, 2021-2022, item no. 56, page no.66

28. File Half Round

28.1 Basic indicative Diagram

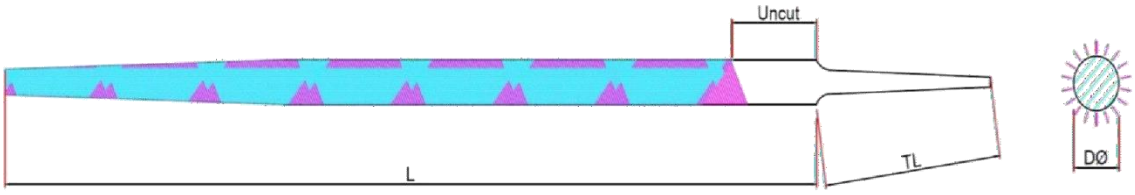


	Range (In MM)	
	From	To
28.2 Bastard		
28.3 Generally conforming to IS 1931-2000		
28.4 Body Length (L)	250	252
28.5 Tang Length (TL)	60	61
28.6 Width (W)	23.70	24.7
28.7 Thickness (T)	6.55	7.25
28.8 No. of Upcut / Inch	(23-24 F/S)	(23-24 R/S)
28.9 Upcut inclination	65^0	65^0
28.10 No. of Overcut / Inch	(17-18 F/S)	(17-18 R/S)
28.11 Overcut Inclination	50^0	50^0
28.12 No. of Edge cut / Inch	23	24
28.13 Edge cut Inclination	65^0	65^0
28.14 Hardness	60 HRC	64 HRC
28.15 Rake Angle	-7^0	-12^0

Source: Specifications for General hand tools – items. Item no.10, page no.12

29. File Round

29.1 Basic Indicative Diagram

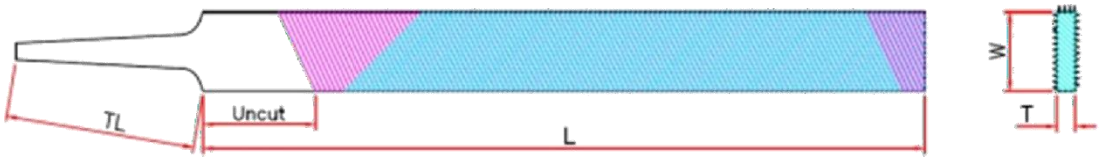


	Range(InMM) From	To
29.2 Generally conforming to IS1931-2000 Bastard		
29.3 Body Length(L)	298	302
29.4 TangLength(TL)	59	61
29.5 Diameter(Ø)	8.35	9.35
29.6 No.ofUpcut/Inch	20	21
29.7 Upcutinclination	64^0	66^0
29.8 No.ofOvercut/Inch	20	21
29.9 OvercutInclination	49^0	51^0
29.10Hardness	60 HRC	64 HRC
29.11RakeAngle	-7^0	-12^0

Source: Specifications for fitter trade VER FT-01, item no.58, page no.68. Only the change is for length.

30. FileHand

30.1 BasicIndicativeDiagram



	Range (In MM) From	To
30.2 Generally conforming toIS1931-2000 2nd cut		
30.3 Body Length(L)	146	150
30.4 Tang Length(TL)	54	56
30.5 Width(W)	19.6	20.6
59.6 Thickness(T)	3.7	4.4
30.6 No.of Upcut/Inch	34	35
30.7 Up cut inclinaton	64^0	66^0
30.8 No.of Overcut/Inch	29	30
30.9 Over cut Inclination	44^0	46^0
30.10 No.of Edge cut/Inch	36	37
30.11 Edge cut Inclination	89^0	91^0
30.12 Hardness	60HRC	64 HRC
30.13 Rake Angle	-7^0	-12^0

Source: Specifications for Fitter Trade VER FT-01, item no.59, page no.69

31. Card File (This item is Consumable)

31.1 Basic Indicative Diagram

31.2 Material Type:Brass OR steel wire
31.3 File Brush:Used to clean debris and material build-up from metal files and rasp teeth
31.4 Steel File Card:Steel fills material
31.5 Steel File:The brush has wooden handle with hole for easys torage
31.6 Dimensions:3x5 inches
31.7 Weight:0.32ounce
31.8 Size die 1mm,1cm x 1cm total -20 nos.

Source: Specifications for fitter trade VER FT-01,2021-2022, item no.60, page no.70.

32. Oil Stone

32.1Basic Indicative Diagram

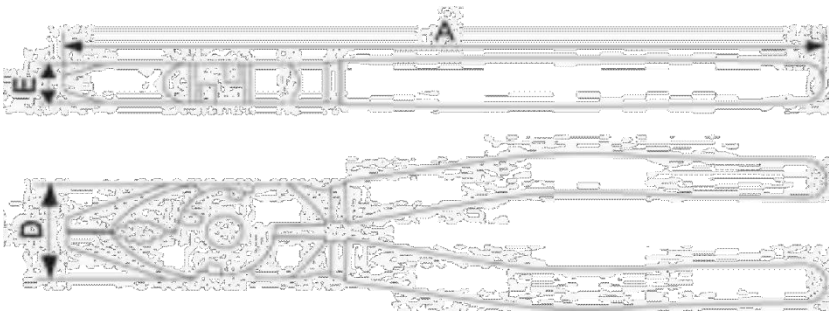
32.2 Length: 150 mm
32.3 Width: 50 mm
32.4 HeightH1: Course-25mm
32.5 HeightH2: Fine-10mm
32.6 Material: SiC (Silicon Carbide)
32.7 Bond: Vitrified

Source: As per dvet, maharashtra state, specification for mechanical tool equipments group items-version3--2018-19-sr.no.72 page no.78

Specification for trade-mechanic electric vehcile level-iv regional office ,Aurangabad.

33. Pliers combination

33.1 Basic Indicative Diagram



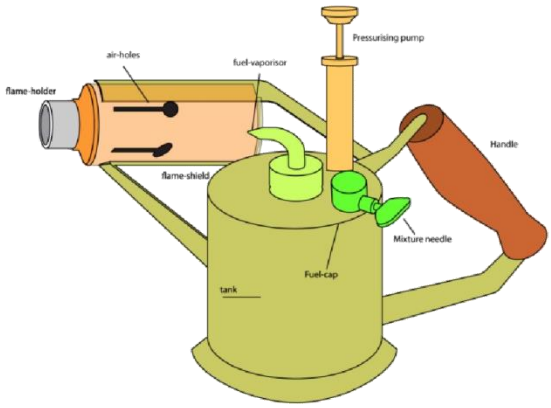
33.2 Generally conform to IS 3650-1981
33.3 Material: C-70
33.4 Finish: Polished/Chrome plated/Satin finish
33.5 Length A):150mm
33.6 Drop forged, hardened tempered
33.7 Differential hardening
33.8 RadiusGap from front side:Up to 0.2mm
33.9 Play between shanks: Up to 0.3mm
33.10 Shank Material: C70/EN9
33.11 Rivet material:SAE 1541/40 Cr4
33.12 Cutting Edge Hardness: 60-62 HRC
33.13 Shank Hardness: 40-48 HRC
33.14 Rivet Hardness: 38-42 HRC
33.15 High Voltage Insulation: Should be able to withstand 4000 VDC or 2800 VAC
33.16 Insulation Sleeves made from High Quality CA Plastic
33.17 Thicker Sleeves for comfortable Grip
33.18 Special thumb protector for sleeves to minimize the risk of electric shock in case Plier slips while in use.
33.19 Should be able to cut soft (74to84Kg/mm^2) & Hard (140Kg/mm^2) wires
33.20 Should be able to cut 2mm of hard wire Diameter & 1mm of soft wire Diameter

Source: Specifications for Mechanical tools and equipment group items Vol-3, item no.157

Specification fo rtrade-mechanic electric vehcile level-iv regional office aurangabad.

34. BlowLamp

34.1 Basic Indicative Diagram

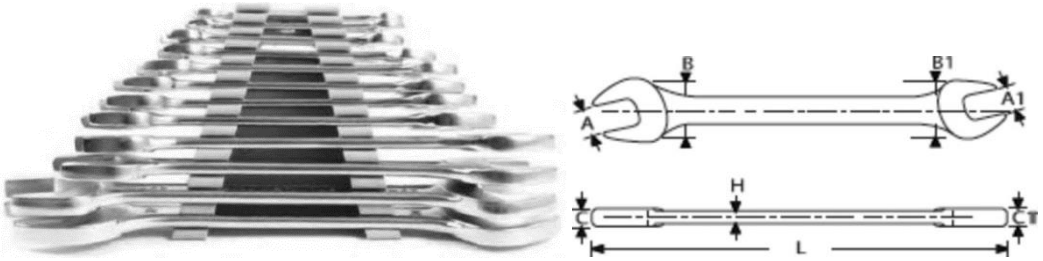


34.2 Generally conform to IS 841-1983
34.3 Material Used: Brass & Iron Steel
34.4 Additional Name: Brass Pressure Kerosene Blow Lamp
34.5 Torch Type Soldering Torch,Brazing Torch
34.6 Should be Longer service life Smooth-finish
34.7 Should be Resistance against corrosion
34.8 Should be Precisely designed
34.9 Top quality,Extremely durable
34.10 Capacity: 0.5 Liters (±10%)

Source: Specifications for fitter trade VER FT-01, 2021-2022, item no. 64, page no.74

35. Spanner-Double Ended- 6x7, 8x, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22mm

35.1Basic Indicative Diagram



35.2 GenerallyConformtoIS2028-1998

35.3 Sizes:6X7,8X9,10X11,12X13,14X15,16X17,18X19,20X22

35.4 SlightlyRoundedhandles-SandBlasted

35.5 NonDamagingGriponnutduetoclosewrenchopeningtolerances

35.6 I-sectiondesignofhandleandheadstocombinestrengthandlowweight

35.7 ThoroughlycorrosionprotectedwithNickelchromefinish

35.8 DeepforgedfromChromevanadiumSteel(31CrV3)

35.9 Hardness:42-45HRC

35.10 Headateachendareofdifferentsizesandsetatanangleof15degrees

35.11 Webshouldbeprovidedinforging

35.12 MinimumTorqueValuesinKg.m

35.13 NominalWidthA/F6-0.6,7-0.9,8-1.3,9-1.9,10-2.5,11-3.3,12-4.2

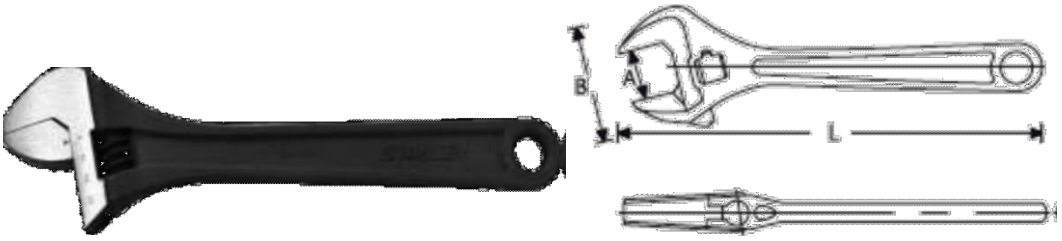
35.14 NominalWidthA/F13-5.3, 14-6.5,15-7.8,16-9.4, 17-10.9,18-13.0

35.15 NominalWidthA/F19-15.2,20-17.50,21-20.20,22-22.9

Source: As per dvet, Maharashtra state, specification for mechanical tools and equipments group items –Volume 03 version 3-2018-19 sr.no.-164 page no.171

36. Spanner adjustable-150mm

36.1 Basic Indicative Diagram



36.2 Generally Conform to IS6149-1984 GradeII

36.3 Length (L):150mm

36.4 Plain Carbon Steel/Cr-Vsteel

36.5 Knurl adjusting mechanism for quick & precise adjustment

36.6 Built-in tension spring stabilize smovable jaw.

36.7 Laser-etched mm jaw scale fo reasy adjustment

36.8 Drop forged with high grade forging Steel

36.9 Play between jaws:1.20mm (maximum)

36.10 Hardness: 40-50HRC

36.11 Minimum Torque Value:8Kg.m

36.12 Maximum Opening (A):19mm

36.13 Made with15 degree head angle to allow use in narrow space shaving arc movement

36.14 Only 30 degree

36.15 Jaw Shank should not protrude out even when fully opened. In full condition, movable jaw should align with outer radius of the handle.

36.16 Adjustable Wrenches Black Phosphate Finish

36.17 Light weight handle design

As per dvet,maharashtra state,specificationfor mechanical tools and equipments group items version3 -2018-19 **sr.no-161** page **no.168**

37. BOX SPANNER SET

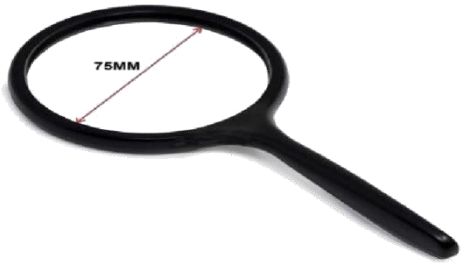
37.1 Basic Indicative Diagram

37.2	Color	Black
37.3	ItemWeight	60Grams
37.4	ItemDimensions	50x30x50 Millimeters
37.5	SocketType	Hex,Combination Set
37.6	WrenchType	Richet Wrench
37.7	WrenchSize	Richet Wrench-10inch
37.8	SocketSize	DRHex-,9,10,11,12,13,14,15,16,17,18,19,20,21,22,24,27,30,32 mm/inch,
37.9	No of pieces	18 Pieces
37.10	Number of Points	6,12
37.11	Material	Chrome Vanadium Steel
37.12	ImpactSocket	Yes
37.13	SocketLength	1/2"inch
37.14	UniversalJoint	Yes
37.15	Extensions	Yes
37.16	Finish	Nickel Chrome
37.17	QuickRelease	Yes
37.18	OtherFeatures	Product Comes with Carry Case
37.19	SalesPackage	18 Piecs Socket
37.20	Packof	22 in the Box
37.21	TommyBar	1 Ratchet

Source: Spefifications prepared by committee

38. Glass Magnifying-70mm

38.1Basic Indicative Diagram

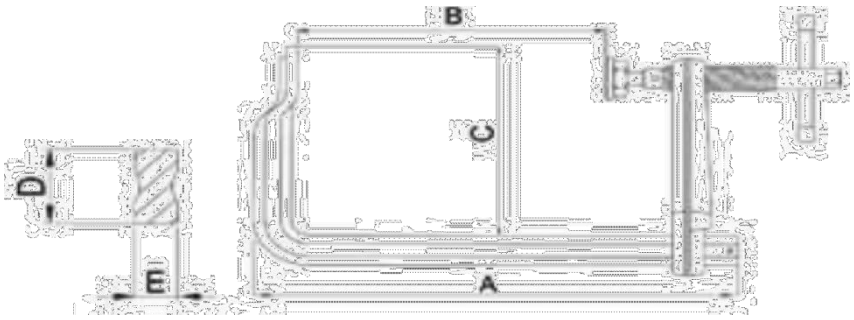


38.2 Color Black
38.3 Required? No
38.4 Magnification 4 X strength
38.5 Premium Design: This magnifying lens comes with a plastic frame. It is durable, strong and easy to handle.
38.6 This handheld magnifying glass can be used for extra sharpness and clarity. Suitable for viewing small print or objects
38.7 Diameter: 75 mm; Lens Type: Plano Convex; Focal Length: 3.15 mm.
38.8 Lens Diameter: 75 mm
38.9 Item Weight 0.12 Gram
38.10 Very thick magnifying glass
38.11 High power Magnifying Glass

Source: Specifications for Fitter trade VER FT-01, 2021-2022, item no.69 page no.79

39. ClampToolmaker-5cmand7.5cmsetof2.

39.1Basic Indicative Diagram

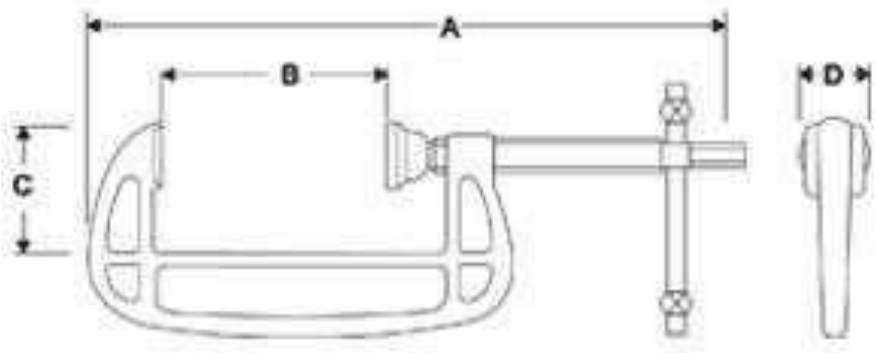


39.1 Made of High-Grade Quality Steel
39.2 High Quality & durable clamping Tool which should be able to retain dimensions & resist distortion even at high clamping force
39.3 Capacity (B): 5 & 7 CM
39.4 Throat Depth (C): 20 mm& 30 mm
39.5 Rail Size: 15.5 X 7.5 mm
39.6 Hardness: 45 - 48 HRC
39.7 Steel Slide rail for smooth action
39.8 Section frame for more strength
39.9 Swivel Head on ball end of operating screw to ensure a secure and easy clamping of Irregular shapes
39.10 Fixed Bracket & Pressure plate should be produced from a single piece so that the Clamp gets maximum strength

Source: Specifications for Fitter trade VER FT-01, 2021-2022, item no.70 page no.80

40.Clamp -C-50mm

40.1 BasicIndicativeDiagram

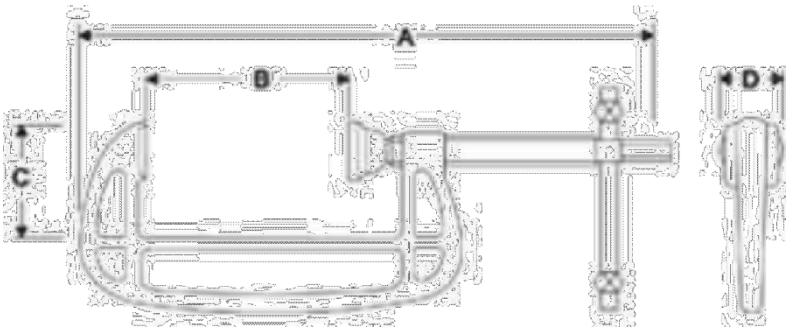


40.2 Generally conform to I.S 9181 – 1988
40.3 Capacity (B): 50 mm
40.4 ThroatDepth(C): 49mm
40.5 Body hot drop forged from high grade Steel
40.6 All parts fully heat treated and black phosphate for long free trouble service
40.7 Hardness: 27-38HRC
40.8 I-section frame for strength and toughness
40.9 Swivel Head on ball end of operating screw to ensure good grip on angle workpieces
40.10 Acmethread on screw to provide higher,quicker,easier movement for clamping/unclamping
40.11 Hex Head on screw to facilitate use of spanners for tightening as and when required
40.12 Serrations provided on PAD & C-clamp body for better gripping
40.13 Tension Load Test (Min):1835Kg

Source: MTE Vol-03 General Handtools Ver 3, 2018-19 Item No.50 Page No.56

41. Clamp"C"-100MM

41.1 Basic Indicative Diagram

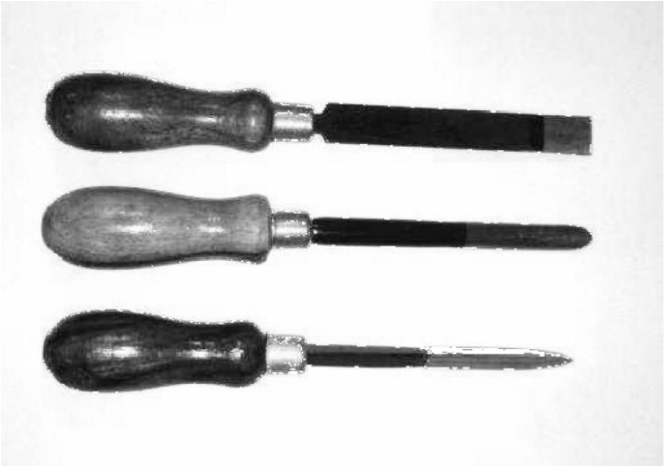


41.2 Generally conform to I.S9181–1988
41.3 Capacity (B): 100mm
41.4 Throat Depth(C):75mm
41.5 Body hot drop forged from high grade Steel
41.6 All parts fully heat treated and black phosphate for long free troubles ervice
41.7 Hardness:27-38HRC
41.8 Section frame for strength and toughness
41.9 Swivel Head on ball end of operating screw t oensure good grip on angle workpieces
41.10 Acmethread on screw to provide higher,quicker,easier movement for clamping/Unclamping
41.11 Hex Head on screw to facilitate use of spanners for tightening as and when required
41.12 Serrationsprovided on PAD&C-clamp body for better gripping
41.13 Tension Load Test (Min): 2510Kg

Source: MTE Vol-03 General Handtools Ver 3, 2018-19 Item No.47 Page No.53
Specification for trade-mechanic electric vehcile level-iv regional office,Aurangabad.

42-43-44- Scraper Flat42,-Scraper, Scraper Traingular 43, Half round 44, 150mm

Basic Indicative diagram



42.0 Flat

42.1 Total Length: 330 mm ± 2 mm
42.2 Blade Length: 200 mm ± 1 mm
42.3 Blade Width: 25 mm ± 1 mm

43. Triangular

43.1 Total Length: 330 mm ± 2 mm
43.2 Blade Length: 200 mm ± 1 mm
43.4 Blade Width: 16 mm ± 1 mm
43.5 Blade Material: High Carbon Steel
43.6 Blade Hardness: 55 - 60 HRC

44. Half round

44.1 Total Length: 330 mm ± 2 mm
44.2 Blade Length: 200 mm ± 1 mm
44.3 Blade Width: 20 mm ± 1 mm

Source: MTE Vol-03 General Handtools Ver 3, 2018-19 Item No.140, Page No.146

45. Chisel - Diamond Point - 9 mm X 150 mm

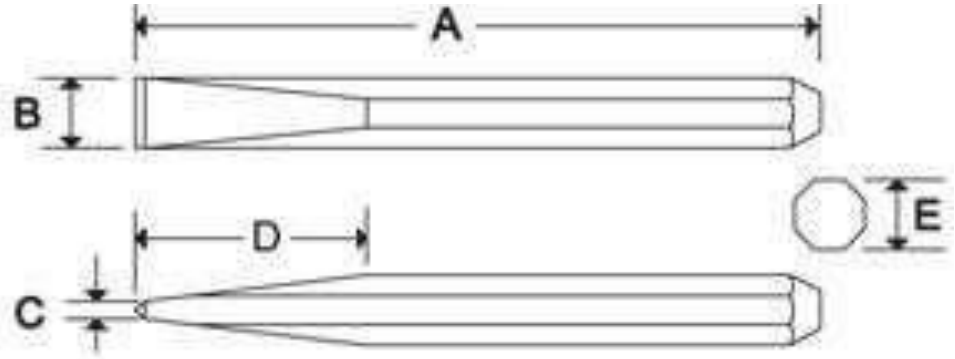
45.1 Basic Indicative Diagram

45.2	Size: 9 mm X 150 mm	
45.3	Made from high carbon Steel 45#	
45.4	Heat treated	
45.5	Hardness	
45.6	Cutting Portion:	55 - 57 HRC
45.7	Striking Portion:	35 - 45 HRC
45.8	Spraying Surface	
45.9	Hardened and Tempered Edges to Cut Steel and Concrete easily	

Source: MTE Vol-03 General Handtools Ver 3, 2018-19 Item No.42, Page No.48

46. Chisel 9 mm flat

46.1 Basic Indicative Diagram



46.2 Generally Conform to I.S 402 – 1990
46.3 Dimensions in mm: A: 125, B: 9, C: 1.50, D: 40
46.4 Drop forged from high grade carbon Steel
46.5 Hardness
46.6 Cutting Portion: 55 - 57 HRC
46.7 Striking Portion: 35 - 45 HRC
46.8 Octagonal Body to facilitate comfortable holding while in use
46.9 Cutting edges should be ground accurately to appropriate angle for metal cutting
46.10 Should be phosphate & painted to provide anti rusting properties

Source: MTE Vol-03 General Handtools Ver 3, 2018-19 Item No.37, Page No.43

47. Chisel - Cold - Round Nose - 6 mm X 100 mm

47.1 Basic Indicative Diagram

47.2 Size: 6mm X 100mm
47.3 Made from high carbon Steel 45#
47.4 Heat treated
47.5 Hardness
47.6 Cutting Portion: 55 - 57 HRC
47.7 Striking Portion: 35 - 45HRC
47.8 Spraying Surface
47.9 Hardened and Tempered Edges to Cut Steel and Concrete easily

Source: MTE Vol-03 General Handtools Ver 3, 2018-19 Item No.40, Page No.46

48. Motorized tenon saw

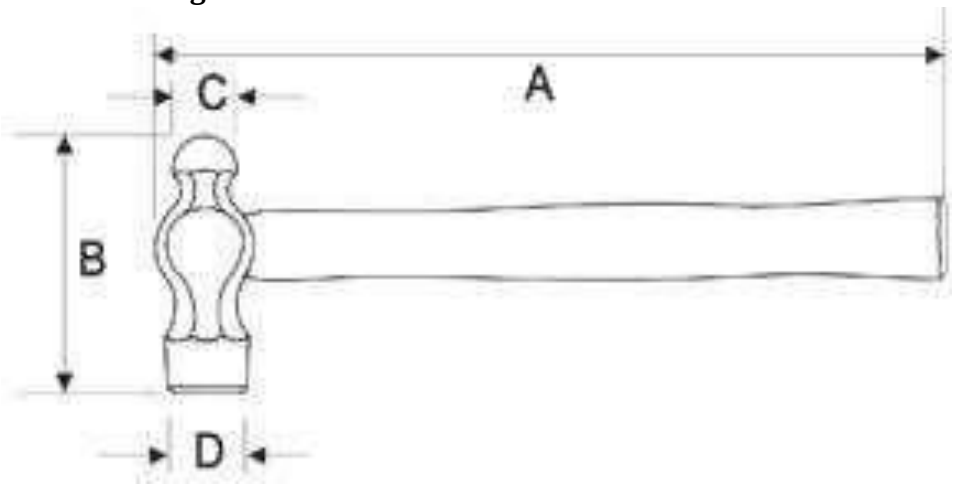
48.1 Basic Indicative Diagram

48.2 Blade Material	Fiberglass,Metal,Steel
48.3 Surface Recommendation	Metal
48.14 Included Components	1 pcs wood saw blade, 1 pcs metal saw blade, Reciprocating Saw Blade
48.5 Product Dimensions	46.8L x 19W x 8.6H Centimeters
48.6 Voltage	28 Volts
48.7 Speed	3300 RPM
48.8 Blade Length	6 Inches
48.9 Number of Teeth	14
48.10 Current Rating	2 Amps
48.11 Wattage	750 Watts

Speifications prepared by committee

49. Hand Hammer1 Kg with handle ball pein

49.1 Basic Indicative Diagram



49.2 Generally conform to I.S. 841 – 1983

49.3 Ball Peen Hammer

49.4 Length: 300 mm + 10%

49.5 Weight: 500 grams

49.6 Drop forged from high grade carbon Steel

49.7 Material: EN – 9

49.8 Partially hardened upto 46 - 56 HRC on striking surface

49.9 Depth of Hardness: 6 mm

49.10 Phosphated and painted

49.11 Handle

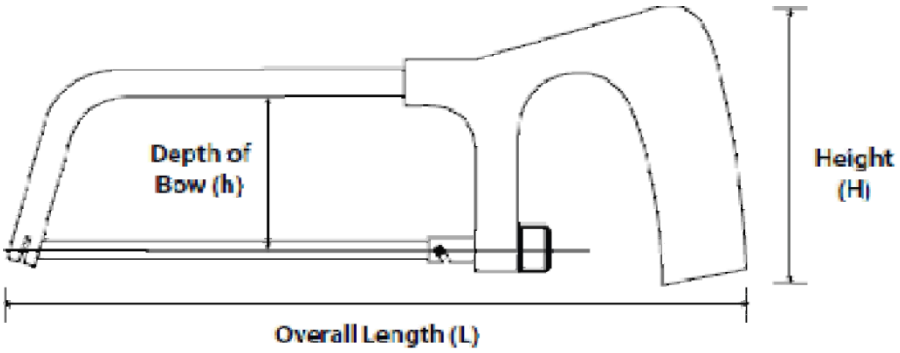
49.12 Material: Hickory Wood/ Red Wood/ Babul Wood/ Indestructible Handle

49.13 Handle fixed firmly to hammer head so that it does not come out after longuse

Source: MTE Vol-03 General Handtools Ver 3, 2018-19 Item No.56, Page No.62

50. Hacksawframefixed 30cm

50.1 Basic Indicative Diagram



50.2 Adjustable for 12 inch (300mm) & 12 inch (300mm) blades

50.3 The blade can additionally be set for sawing at 90°

50.4 16.4 Storage compartment in the tubular bow should allow for storing spare blades

50.5 Should be Fitted with a 12″ (300 mm) Steel hacksaw blade

50.6 Overall Length(L): 430mm + 10%

50.7 Height (H): 150 mm + 10%

50.8 Depth of Bow(H): 106mm + 10%

50.9 Strong Frame

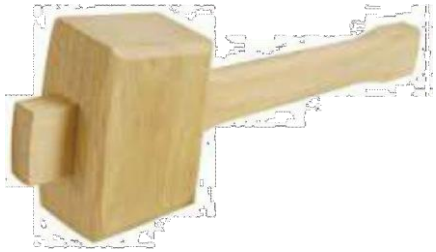
50.10 Should have adjustable tension lever

50.11 Should be able to build 30000 PSI in 12 turns

Source: MTE Vol-03 General Handtools Ver 3, 2018-19 Item No.16, Page No.26

51. Mallet Dia.100mm X150 mm

51.1 Basic Indicative Diagram



51.2 Total Length: 325 mm ± 3mm

51.3 Max.Width.128 ± 1mm

51.4 Min.Width:112 ± 1mm

51.5 Thickness: 60mm ± 1mm

51.6 Wood material: Hard Wood

51.7 Handle grip is secured by a long taper

51.8 Should be light weight for fine working

51.9 Finishing:Fine finishing with body or chamfered.

51.10 Should be easy to operate for operator during hammering.

Source: Spicifications for MTE, VER 3, item no.68, page no.74

52. V-block. Files, mallets, screw drivers, chisels etc.(These items to be treated as raw materials)

53. Hand drill machine

53.1 Basic Indicative Diagram

53.2	Usage/Application:	Industrial
53.3	Warranty:	1Year
53.4	Packaging:	Box
53.5	ModelName/Number:	Any with latest standard specifications
53.6	Material:	StainlessSteel
53.7	Weight:	1.8Kg
53.8	Rated Input Power:	600W
53.9	Rated Torque:	1.5Nm
53.10	Chuck Min Capacity:	1.5mm
53.11	Chuck Max Capacity:	06mm

Source: Specifications for Machinist Grinder, VER GR-01, 2021-2022, item no.83, page no.90

54. Metal saw

54.1 Basic Indicative diagram

54.2 Special Feature	Spindle Lock
54.3 Product Dimensions	30L x 30W x 30H Centimeters
54.4 Voltage	230 Volts
54.5 Item Weight	5.3 Kilograms
54.6 Speed	3800 RPM
54.7 Saw blade diameter	355 Millimetres
54.8 Cutting Angle	45 Degrees
54.9 Saw blade bore	25.4 mm

Specifications prepared by committee

55. Straight Grinder heavy duty with attachments

55.1 Basic Indicative diagram

55.2 Material	Alloy Steel
55.3 Product Dimensions	30L x 20W x 11H Centi meters
55.4 Style	Angled
55.5 Power Source	Corded Electric
55.6 Colour	Multicolour
55.7 Item Weight	2500 Grams
558 Voltage	220 Volts
55.9 Wattage	380 Watts
55.10 No load Speed	10000-30000 RPM

Specifications prepared by committee

56. Professional air blower

56.1Basic Indicative diagram

56.2 Wattage	1200 Watt
56.3 Power consumption	820 Watt
56.4 No Load speed	16000 rpm
56.5 Flow rate	4.5 m3/s

Specifications prepared by committee

57. Jig saw portable

57.1 Basic Indicative diagram

57.2 Rated voltage:		230V~50Hz
57.3 Rated Input Power:		900 W
57.4 Rated no load speed:		11000 rpm
57.5 Product Dimensions	60L x 48W x 35H Centi meters	
57.6 Voltage	220 Volts (AC)	
57.7 Speed	11000 RPM	
57.8 Number of Teeth	60	
57.9 Cutting Angle	45 Degrees	
57.10 Blade Shape	Round 100mm	

Specifications prepared by committee

58. Hammer drill wired

58.1 Basic Indicative diagram

58.2 Speed 1500rpm

58.3 Max. Wattage 720Watt

58.3 Included with suitable hammer part and accessorries

58.4 Light weight, variable speed

58.5 Corde

58.6 Operating Voltage 230V AC

58.7 Max Current 14 Amp or as per wattage

58.9 Pacakging Standard and portable case

Speifications prepared by committee

59. Hand held sander/ polisher

59.1 Basic Indicative Diagram

59.2 Included Components	Polisher, Carbon Brushes
59.3 Material	Stainless Steel, Aluminium, Acrylonitrile Butadiene Styrene (ABS)
59.4 Power Source	ac
59.5 Amper rating	1.27 Amps

Specifications prepared by committee

60. Digital dial torque wrench

60.1 Basic Indicative Diagram

60.2 Maximum Torque Range: 280 Nm
60.3 Minkimum Torque range: 20Nm
60.4: Overall length: 690mm

Specifications prepared by committee

61. Lifting tackle/ sling

61.1 Basic Indicative Diagram

61.2 Wire rope nylon

61.3Weight carrying capacitiy: 1ton x 2mtr

Specifications prepared by committee

62. Impact wrench ½" Drive

62.1 Basic Indicative Diagram

62.2 Head Style	Fixed Square
62.3 Item Torque	850 Newton Meters
62.4 Operation Mode	Pneumatic
62.5 Product Dimensions	20 x 15 x 15 cm; 4 kg

Specifications prepared by committee

63. Laser light pen

63.1 Basic Indicative Diagram

63.2 Product Dimensions	1 x 1 x 16 cm; 100 g
63.3 Batteries	2 AAA batteries required. (included)
63.4 Item model number	Laserpinterlight-green
63.5 Special Features	Portable, Light Up
63.6 Display Technology	LED
63.7 Display Type	LED
63.8 Power Source	Battery
63.9 Batteries Required	Yes

Specifications prepared by committee

64. Suface Plate

64.1Basic Indicative Diagram

64.2 Total Length: 600 mm ± 1 mm

64.3 Total Width: 600 mm ± 1 mm

64.4 Total Height: 700 mm ± 0.5 mm

64.5 Plate Thickness: 40 mm ± 0.2 mm

64.6 Surface Plate Material: Cast Iron

64.7 Surface Finish: Precision Lapped Finish.

64.8 Uniformity in Hardness, Low Porosity, Non Magnetic, Easy To Clean, Rust Proof, Non corrosive

64.9 Should be useful for measuring area flatness.

64.10 Suitable plywood cover should provided

Source: Spicifications for MTE, VER 3, item no.179, page no.186

65. Digital Screw pitch guage

65.1 Basic Indicative Diagram

65.2 Working temperature: 0 centigrade - 40 centigrade

65.3 Working voltage: 3.0V/DC (2 x CR2032, included)

65.4 Max. Current consumption: 3Ma

65.5 The new Digital Pitch Gauge from LT90 offers simplicity, high accuracy and ultra fast pitch angle measurement. The pitch gauge is powered by two CR2032 button cells and allows blades from 250 to 700 mm.

65.6 Model Number	TL
65.7 Batteries Required	No
65.8 Batteries Included	No
65.9 Material Type(s)	Plastic
65.10 Package Dimensions	12.8 x 8.31 x 1.9 cm; 41 g
65.11 Item model number	TL
65.12 Manufacturer recommended age	10 months and up
65.13 Manufacturer	Solo Good
65.14 Item Weight	41 g

Specifications prepared by committee

66. Laser distance measurement instrument

66.1 Basic Indicative Diagram

66.2 Laser diode: 635 mm < 1mW
66.3 Measuring range 0.15 to 40 mtr

66.4 Laser class 2

65.5 Measurement accuracy 2.0mm

65.6 Measurement time 0 .5 sec

66.7 Automatic deactivation 5 min.

Specifications prepared by committee

67. Palm Scale

67.1 Basic Indicative Diagram

67.2 Dimensions 3.25”x4.75”
67.3 Display LCD with reverse backlite screen
67.4 Linearity +/0.1gram to 0.005 oz
67.5 Operating Temp. 16^0C

Specifications prepared by committee

68. Allen screw wrench tool

68.1 Basic Indicative Diagram

68.2 Finish Type Satin
68.3 Operation Mode mechanical
68.4 Product Dimensions 3x3x10xcm, 100g

Specifications prepared by committee

69. Universal quick adjustable multifunction wrench spanner

69.1 Basic Indicative Diagram

69.2 Type Speed Wrench
69.3 Orientation: Double sided
69.4 Adjustable
69.5 Size 9-32-, 9-14
69.6 Weight 650 grams
69.7 Other Dimensions 4*7*15
69.8 Other Features Rubberized grips, automatically fits to the size and shape of nut -bolts

Specifications prepared by committee

70. Double ended wrench spanner

70.1 Basic Indicative Diagram

70.2 Key features
70.2.1 Type rachet wrench
70.2.2 Orientation:Double sided
70.2.3 Adjustable
70.2.4 Size 8, 10, 11, 13, 14, 16, 17, 19
70.2.5 Wrench type single
70.2.6 Material stainless steel, rubber
70.207 Weight 250 grams

Specifications prepared by committee

71. CAR LIFT 4 TON

71.1 Basic Indicative Diagram

71.2 Lifting capacity 4000kg Maximum

71.3 Lifting height 1900mm, Minimum lifting height 85mm, Overall height 360mm

71.4 Overall width 3426mm, Width between columns 2803mm, Maximum vehicle width 2576mm

71.5 Lifting time 40s, Lowering time 60s, Noise level 70 dB (A0/1m average weight of package 620kg)

71.6 Electric motor- Voltage 220V, Power 2.2 Kw, Speed 2850rpm.

71.7 Power unit Type- Gear Flow rate 4.8 cm^3/g, Continuous working pressure 170 bar - 190 bar, Peak pressure 210 bar

Specifications prepared by committee

72. TWO WHEELER BIKE OR SCOOTER ASSEMBLY SET

72.1Basic Indicative Diagram

72.2 Range: 110Km/Hr., Motor Power: 6 Kw, Motor Type: PMSM,
72.3 Battery Warranty: 30.000km or 3 Yrs.
72.4 Vehicle Warranty: 50.000km or 5 Yrs
72.5 Portable Home Charger: 5Hr 55Min (0-80%)

Specifications prepared by committee

73. Transmission / Gear Box Demo Kit

73.1Basic Indicative Diagram

73.2	Size	35″ Inch
73.3	Gear Type	Cross Gear
73.4	Gear Ratio	1:10
73.5	Max Speed	≤30km/h
73.6	Adaptive motor voltage	48v 60V 72V

73.7	Rated Voltage	36V
73.8	No-load Current	1A
73.9	Rated Current	14A
73.10	Rated Power	350W
73.11	Speed	328 RPM
73.12	Colour	Black/Grey
73.13	Compatible Wheel Size	20 to 28 in
73.14	Spoke Holes	36

73.15	Rated Voltage	60v
73.16	Rated Power	3000W
73.17	Rated Current	50 A
73.18	Rated Speed	4200 RPM
73.19	Weight	10726 gm
73.20	Peak Torque	14Nm
73.21	Peak Power	5000W

Specifications prepared by committee

74. Cooling System components arranged on a stand with electric motor

74.1Basic Indicative Diagram (see item no.81 for details)

Specifications prepared by committee

75. Exhaust System

75.1Basic Indicative Diagram (see item no.81 for details)

Specifications prepared by committee

76. Mini commercial Vehicle Chasis Structure

76.1Basic Indicative Diagram

76.2 Battery	12 Volt /100 AH
76.3 Gross Weight	214 Kilograms
76.4 Speed	25 Km / hr
76.5 Drive Type	Electric
76.6 Power	1480 Watt(w)
76.7 Size	2080x950x1260 cm
76.8 Load Capacity	350 Kilograms (kg)

Specifications prepared by committee

77. Rear Axel

77.1 Basic Indicative Diagram

77.2	Size	35″ Inch
77.3	Gear Type	Cross Gear
77.4	Gear Ratio	1:10
77.5	Max Speed	≤30km/h
77.6	Adaptive motor voltage	48v 60V 72V

Specifications prepared by committee

78. Suspension System Front & Rear on Stand

78.1 Basic Indicative Diagram (see item no.81)

Suspension Sets for 2/3/4-Wheeler

78.2 Fork Compression: 50mm-60mm
78.3 Existing suspension system weight: 30kg
78.4 Vibration: 3.5 Hz
78.5 C.G Height: 650m
78.6 Shock absorber angle m: 63.7

Specifications prepared by committee

79. Steering Wheel & Tyre System Assembly on stand

79.1Basic Indicative Diagram

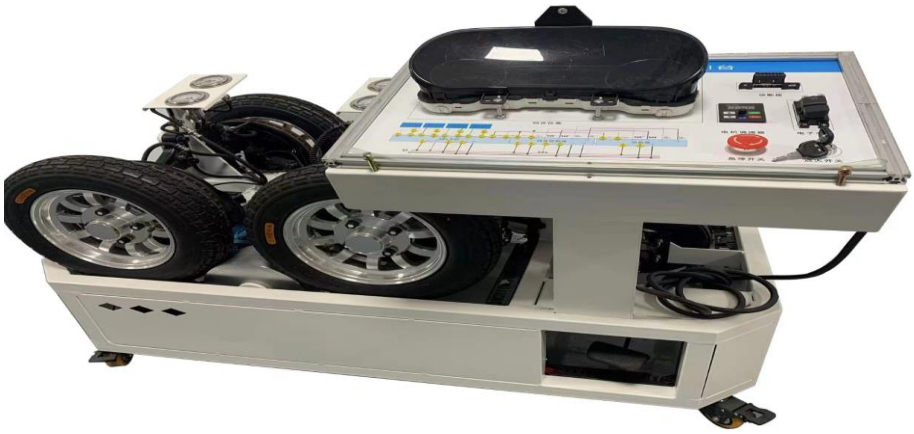
ELECTRIC POWER STEERING SYSTEM

79.2 Product size-1700×1200×1800mm(L×W*H)
79.3 Input voltage-AC 220V±10% 50Hz
79.4 Work voltage-DC 12V
79.5 Work temperature- -40℃～+50℃
79.6 Caster size：100*50mm

Specifications prepared by committee

80. Disc / Drum Brake System on Stand (Working Model)

80.1 Basic Indicative Diagram



CAR ABS TRAINER

80.2 Panel size: 980mm*850mm ;

80.3 Product size: 1100mm*1400mm*1850mm ;

80.4 Input voltage-AC 220V 50HZ ;

80.5 Work temperature: -5℃-+40℃

80.6 Product weight: 280KG

Specifications prepared by committee

81. Engine and Transmission System on Stand (Working Model)

81.1Basic Indicative Diagram

81.2 Product size (mm)	1200*1200*1600（L*W*H）
81.3 Input voltage	Ac220v±10% 50hz
81.4 Total motor power	160 KW
81.5 Total motor Torque	310 N.M
81.6 Drive motor	Single motor
81.7 Motor layout	Front

Specifications prepared by committee

82. HVAC Demo Kit

82.1 Basic Indicative Diagram

82.2 Product size (mm）	1600*1450*1600（L*W*H）
82.3 conditioning compressor work voltage	≥DC600V
82.4 Warm wind module work voltage	≥DC600V
82.5 Low voltage work power	DC12V

Specifications prepared by committee

83. Electronic Ignition System of an Automobile 4-wheeler

83.1 Basic Indicative Diagram (see item no.81 for details)

Specifications prepared by committee

84. Demonstration Board of Working Model MPFI System with Motorized Control

84.1 Basic Indicative Diagram

84.2 The device should be designed based on latest technology with Multi Point Fuel Injection System.The trainer should be able to simulate engine start up, speedup, slowdown and other actions so as to illustrate the structure and working principle of MPFI engines.

84.3 Engine Type: 4 Cylinder, naturally aspirated petrol.

84.3.1	Bore:	70 - 95 mm,
84.3.2	Stoke:	72 - 110 mm
84.3.3	Displacement:	1000 - 1200 CC
84.3.4	Compression Ratio:	(8-16: 1)
84.3.5	Maximum Power:	50-80 HP at 3200-6000
84.3.6	RPM.Valve Gear:	4 Per Cylinder.
84.3.7	Fuel Supply System:	MPFI
84.3.8	Ignition system:	Spark Ignition
84.3.9	Cooling System:	Water Cooling with Reserve
84.3.10	TankFuel Tank:	10 Liter including fuel gauge

84.4 Real and operating MPFI petrol engine, illustrating the structure and working process.

84.5 Engine management circuit diagram with wiring colour code and internal diagram of the ECU with part listing and naming should be printed on to Colour printed board base.

84.6 Test points should be provided on the printed base so that different voltages/current, resistance values etc. can tested/understood using a multi meter.

84.7 Automobile meters should be fitted on to the training module along with the printedcircuit diagram,to demonstrate engine speed, temperature, fuel pressure, charging light etc.,

84.8 The training module should be fitted with diagnostic socket (DLC) for universalautomobile decoder (Scan tool) to read fault codes, clear fault codes and read data stream.

84.9 Fault setting switch bank should be provided to induce faults in the training module to Set, demonstrate and diagnosis the line break, grounding short circuit, improper contact or open circuit faults can be induced, user can adjust the number and type of faults.

84.10 User can adjust the number and type of faults- Set the line break, grounding short circuit, improper contact or open circuit faults can be induced,.

84.11 Diagnostic reader should be attached to the model to display the error codes.

84.12 Good working condition engine should be provided with fuel tank and battery.

84.13 Throttle control should be provided on the module to accelerate.

84.14 The training module should be fabricated using steel pipe frame with spray painted.

84.15 The entire setup is should be provided with caster wheels with brakes for easy movement of the same.

84.16 The model should be equipped with colour circuit diagram of engine management system and its external connection and parts, so that the trainees can easily identify the wiring connections to different sensors and actuators.

84.17 Fault setting switch bank should be provided along with the engine so that the trainees can create troubles and check the reaction of the engine and diagnosis the problem and rectify.

85. Instruction Kit for Charging System

85.1.1 Basic Indicative Diagram

85.1.2 **3.3 KWh AC Charger, 15A socket and charging power levelsup to 220**

		Characteristics	Parameter
85.1.4	Input	Input voltage (AC)	230 Vac + 10%, 50 Hz
85.1.5	Output	Rated Output Voltage	54.75vdc
85.1.6		Output Voltage Range	48~70 VDC
85.1.7		Output Rated Current	8A
85.1.8		Stabilization Accuracy	+- 0.3

Specifications prepared by committee

85.2 DC CHARGERS (30 KWh)

85.2.1 Basic Indicative Diagram

85.2.2	AC Input Voltage Range (V)	380±15%, 3 phases +N+PE
85.2.3	Frequency Range (Hz)	45~66Hz
85.2.4	Output Voltage Range (V)	200-1000Vdc
85.2.5	Output Voltage Range under Constant Power (V)	300-1000Vdc
85.2.6	Output Power (Kw)	30
85.2.7	Max. Output Current (A)	100

Specifications prepared by committee

86. Instruction Kit for Starting System (see item no.81 for details)

Specifications prepared by committee

87. Lighting and Wiring System Mock Layout

87.1 Basic Indicative Diagram

EV ELECTRICAL LIGHTNING SYSTEM

87.2 Detection control panel,

87.3 Combination switch,

87.4 Left and right fog light,

87.5 Left and right turn signal,

87.6 Left and right small light,

87.7 Left and right combination tail light,

87.8 License plate light,

87.9 Light switch, Danger switch, Reverse light switch, Brake light switch,

87.10 Intelligent fault setting and assessment system, Mobile platform (with self-locked caster installation device)

87.11	Product size	1600×700×1700mm(L*W*H)
87.12	Power AC	220V±10% 50Hz
87.13	Work voltage DC	12V
87.14	Work temperature	-40℃～+50℃

Specifications prepared by committee

88. System Setup and Integration with Design

88.1 Basic Indicative Diagram

88.2 Brand Name	PSP TECHNOCADD or any other equivalent
88.3 Product size（mm）	2000*1200*1600（L*W*H）
88.4 Work voltage	DC12V
88.5 Battery type	Ternary lithium battery
88.6 Battery Capacity	60.48Wh

88.7 BMS Tester & Simulator with Software Integration
88.8 24 Series 100 Amps cell simulator
88.9 Cell Simulator with Software platform license.

Specifications prepared by committee

89. Electric Vehicle (Four Wheeler)

89.1 Basic Indicative Diagram

89.2 EV Four-Wheeler with High Voltage System with Lithium -Ion battery and Charger

89.3	Battery Capacity	30KWh
89.4	Boot Space	350L
89.5	Range	325 Km/Charge
89.6	Charging Time	10.5hrs
89.7	Acceleration (0-100 kmph)	9.2 seconds
89.8	Max Motor Performance	127 bhp 215 Nm
89.9	Warranty	3 Years / 125000 kms
89.10	Tyre Size	215/60 R16
89.11	Central Locking	Keyless
89.12	Power Steering	Yes
89.13	Start Stop Button	Yes
89.14	Asr Traction Control	Yes
89.15	Electronic Stable Program	Yes
89.16	Electronic Break Force Distribution	Yes
89.17	Anti-Lock Braking System	Yes

Specifications prepared by committee

90. Electric Vehicle Kit Chassis

90.1 3-Wheeler Passenger Full Vehicle for Assembly & Disassembly

90.1.1 Basic Indicative Diagram

90.1.2	Top Speed	50 km/h
90.1.3	Certified range	Typical driving range of 80 km
90.1.4	Gradeability	7°
90.1.5	Battery type	Lithium-ion, 48V
90.1.6	Battery capacity (Installed)	7.37kWh
90.1.7	Charging time at standard conditions	3 hrs. 50 min
90.1.8	Peak power	8 kW
90.1.9	Peak torque	42 Nm
90.1.10	Transmission type	Direct drive technology.
90.1.11	Suspension - Front	Helical Spring + Damper +Hydraulic shock absorber
90.1.12	Suspension - Rear	Rigid axle with leaf spring
90.1.13	Brakes - Front/Rear	Hydraulic brake
90.1.14	Parking brake	Mechanical lever type

Specifications prepared by committee

90.2 4-Weeler Buggy

90.2.1 Basic Indicative Diagram

90.2.2	Maximum Speed	150 KM
90.2.3	Colour	White
90.2.4	Country of Origin	Made in India
90.2.5	Seating Capacity	6-Seater

90.3 Electric Vehicle Component Checker / Diagnostic

90.3.1 Basic Indicative Diagram

90.3.2 OS	Android 7.0 or advanced
90.3.3 Processor	2.0GHz, Quad Core
90.3.4 Display	12.9 inch or more TFT-LCD with 2732 x 2048 resolution & capacitive touch screen
90.3.5 Camera Rear	16 Megapixel or more
90.3.6 Autofocus with Front	5 Megapixel or more
90.3.7 Memory	4GB RAM or more & 256GB On-board Memory or more
90.3.8 Battery	18,000mAh

Specifications prepared by committee

90.4Solar Based Charging – Specification could not find.

90.5 Safety Tool Kit

90.5.1 Basic Indicative Diagram



90.5.2 Head Protection: Helmets (Class E (Electrical) Hard Hats) for High voltage protection.

90.5.3 PPE for body: Flame-resistant clothing(jackets). 1mm thick orange neoprene with nylon insert for added strength, this apron is to protect technicians working with live voltages up to 1000V.

90.5.4 Eye and Face Protection: Safety Glasses & Face Shield.

90.5.5 Foot Protection: Safety Shoes: Dielectric over boot provides additional protection of insulation, preventing electric shocks.

90.5.6 Insulation Glove both leather and rubber: High Voltage Electrical Protective Gloves Cut & Stab Resistant Rubber Insulating Handwear. Mechanical hazards and electrical arcing, insulated rubber gloves with High voltage Protection. High Voltage Electrical Protective Gloves Cut & Stab Resistant Leather Insulating Handwear.

90.5.7 Insulated Rescue Hook: Superior Electrical Insulation, Dip Coated Hook & 6 Feet Size

90.5.8 Fire Blanket: (1 Mtr x 2 Mtr) Fire Suppression Blanket, Fiberglass, Waterproof, Tear Resistant,

90.5.9 Lightweight, Flame Resistant, Abrasion Resistant, Low Temperature Resistant, Reusable, No Expiry

90.5.10Fire extinguisher: ALFA Fire CO2 Type Fire Extinguisher (2kg, Red and Black) - Used for Electrical fire Risks/Computer Server Rooms/Class B Fires **Sixty-four square feet Rubber floormat (1 Set)** CLASS A - 2MM THICKNESS. WIDTH 1MTR X LENGTH 2MTR.

Specifications prepared by committee

91. Multimeter Digital

91.1 Basic Indicative Diagram

Voltage DC	
91.2 Maximum voltage	1000 V
91.3 Accuracy	±(0.05% + 1)
91.4 .Maximum resolution	10 µV
Voltage AC	
91.5 Maximum voltage	1000 V
91.6 Accuracy	±(0.7% + 2) True RMS
91.7 Maximum resolution	0.1 mV
91.8 AC bandwidth	20 kHz with low pass filter; 3 dB @ 1 kHz
Current DC	
91.9 Maximum amps	10 A (20 A for 30 seconds maximum)
91.10 Amps accuracy	±(0.2% + 2)
91.11 Maximum resolution	0.01 µA
Current AC	
91.12 Maximum amps	10 A (20 A for 30 seconds maximum)
91.13 Amps accuracy	±(1.0% + 2) True RMS
91.14 Maximum resolution	0.1 µA
Resistance	
91.15 Maximum resistance	50 MΩ
91.16 Accuracy	±(0.2% + 1)
91.17 Maximum resolution	0.1 Ω
Capacitance	
91.18 Maximum capacitance	9,999 µF
91.19 accuracy	±(1% + 2)
91.20 Maximum resolution	0.01 nF
Frequency	
91.21 Maximum frequency	200 kHz
91.22 Accuracy	±(0.005% + 1)
91.23 Maximum resolution	0.01 Hz

92. Ammeter able to read up to 300A

92.1 Basic Indicative Diagram

Max Voltage in between any Terminal and Earth Ground	
92.2 AC	1000V
92.3 DC	1500V
92.4 Batteries	2 AA IEC LR6 Alkaline
92.5 Display	Dual Display with Backlight
92.6 Automatic Power Off	20 min
AC Current	
92.7 Range	999.9A
92.8 Resolution	0.1A
92.9 Accuracy	2% + 5 digits (10Hz-100Hz) 2.5% + 5 digits (100Hz-500Hz)
DC Current	
92.10 Range	999.9A
92.11 Resolution	0.1A
92.12 Accuracy	2 % RD + 5 digits
AC voltage	
92.13 Range	600.0 V-1000 V
92.14 Resolution	0.1 V (≤600.0 V)- 1 V (≤1000 V)
92.15 Accuracy	1 % RD + 5 digits (20 Hz to 500 Hz)
DC voltage	
92.16 Range	600.0 V-1500 V
92.17 Resolution	0.1 V (≤600.0 V)-) 1 V (≤1500 V)
92.18 Accuracy	1 % RD + 5 digits

Specifications prepared by committee

93. Continuity Tester

93.1 Basic Indicative Diagram

93.2 Temperature	Operating: -10°C to 55°C Storage: -30°C to 60°C
93.3 Relative 93.4Humidity	90%: 0°C to 30°C 75%: 30°C to 40°C 45%: 40°C to 50°C
93.5 Battery Type/Life	AAA (2); 40 Hours
93.6 Ac Bandwidth	45 Hz – 60 Hz
93.7 Max working Voltage	1000V AC/DC
93.8 Max Measurable Voltage	600V
93.9Duty Cycle	Identifies Voltage upto 240V For Voltages between 240V-600V the Duty Cycle is 30s on/300s off For voltages above 240V the tester must be connected to a voltage source only for a maximum of 30s and then disconnected for a minimum of 300s
93.10 Voltage hazard 93.11 LED	LED turns on at voltage > 30V AC/DC ±35% 12V, 24V, 48V, 120V, 208V, 240V, 277V, 480V, 600V
93.12 LED's	LED turns on at 90% and 100% of the indicated voltage on the LED, except for 12V which turns on at 50% and 100%
93.13LED Accuracy	AC voltage: ± (3% rdg + 2 Digits) AC voltage: ± (2% rdg + 2 Digits) AC voltage: ± (5% rdg + 3 Digits)
93.14 LCD Resolution	0.1 V for voltages <50V, 1V for voltages ≥50V 0.01kΩ for resistance measurement
93.15 GFCI Test	100 V - 150 V @ 6 mA - 9 mA AC, 150 V - 250 V < 12 mA
93.16 Current	
93.17 Standard input test current	<5mA

Specifications prepared by committee

94. Tyre Pressure Gauge

94.1 Basic Indicative Diagram

94.2 Tyre Pressure Gaug	
94.3Working Pressure Range (Bar)	0 to 6.2 bar
94.4 Product Width	13 mm
94.5 Product Weight	0.09 Kg
94.6 Product Length	224 mm
94.7 Accuracy	**0.01**

Specifications prepared by committee

95. Measuring Tape

95.1 Basic Indicative Diagram

95.2 Digital Measuring tape

95.3 Case Material	ABS
95.4 Lock Type	Button
95.5 Blade Material	Stainless Steel
95.6 Blade Length	5 Meter
95.7 Batteries	CR2032

Specifications prepared by committee

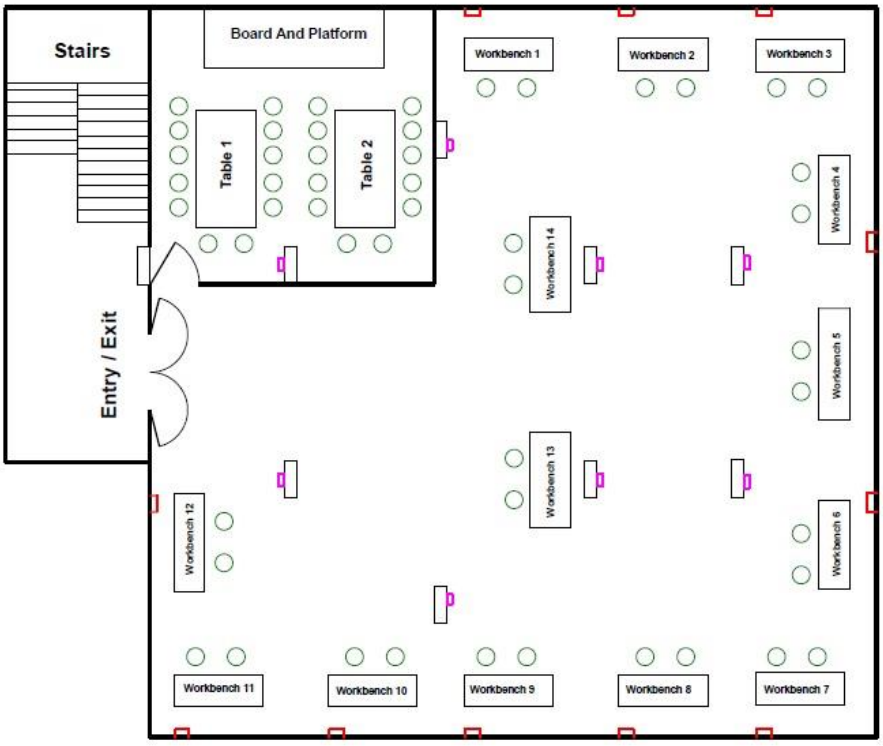
96. Electrical Soldering Iron

96.1 Basic Indicative Diagram

96.2 Operating Voltage	AC100-240V,60Hz
96.3 Operating temperature range	200-480˚C
96.4 No-Load Stand by Power	≤ 5w
96.5 Max power	60w
96.6 Temperature stability (No-Load)	±2 ˚C

Specifications prepared by committee

Proposed Lay out for Mechanic Electric Vehicle

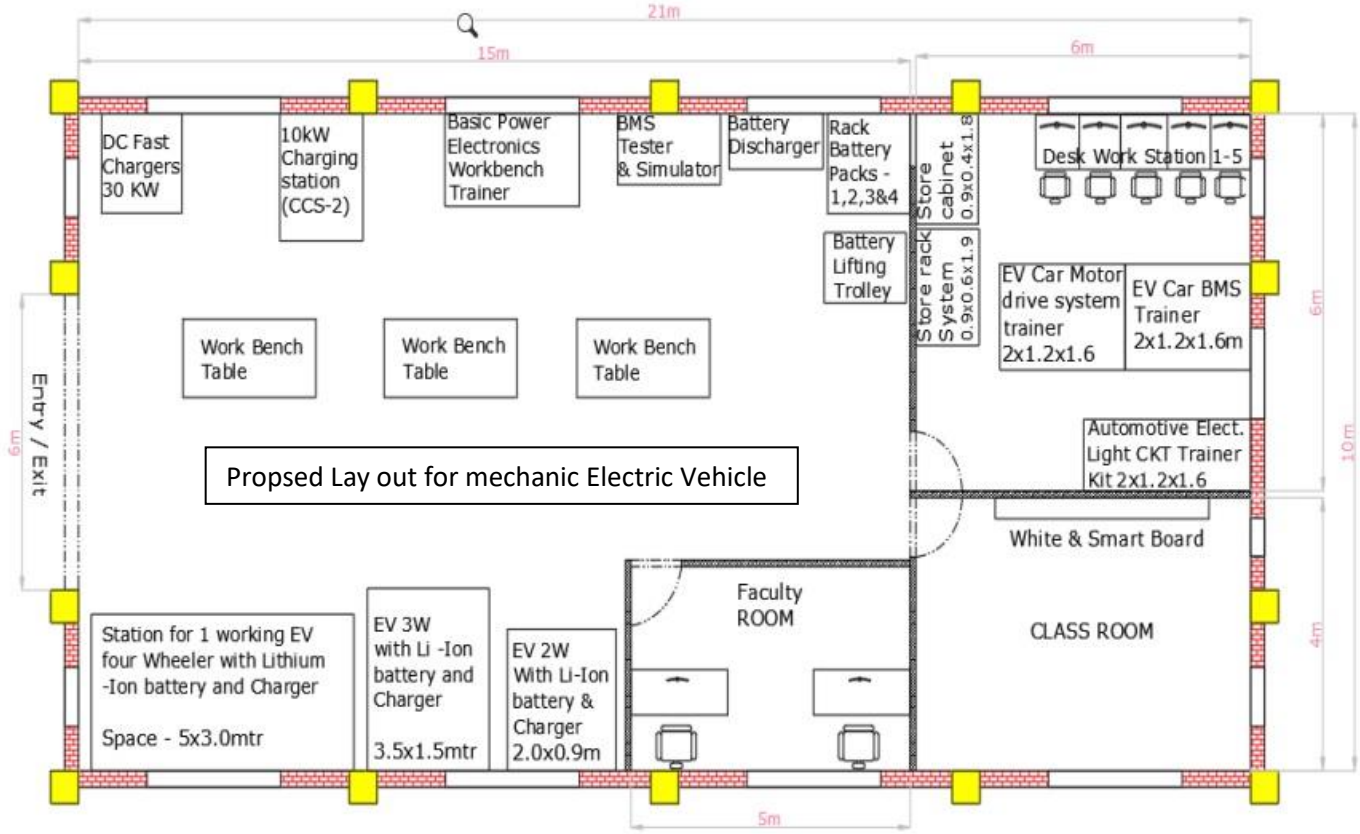


Power Supply

- 2- 20A, 2- 5A
- 1- 20A, 1- 5A

List Of Requirments

1) 3 Phase Power supply
2) False Ceiling
3) Air Conditioner
4) Black Board
5) 2 - Office Chairs
6) 64 Chairs
7) 2 Tables


21m
15m
6m
DC Fast Chargers 30 KW
10kW Charging station (CCS-2)
Basic Power Electronics Workbench Trainer
BMS Tester & Simulator
Battery Discharger
Rack Battery Packs - 1,2,3&4
Store cabinet 0.9x0.4x1.8
Desk Work Station 1-5
Battery Lifting Trolley
Store rack System 0.9x0.6x1.9
EV Car Motor drive system trainer 2x1.2x1.6
EV Car BMS Trainer 2x1.2x1.6m
Work Bench Table
Work Bench Table
Work Bench Table
Entry / Exit
6m
Propsed Lay out for mechanic Electric Vehicle
Automotive Elect. Light CKT Trainer Kit 2x1.2x1.6
White & Smart Board
Faculty ROOM
CLASS ROOM
Station for 1 working EV four Wheeler with Lithium -Ion battery and Charger
Space - 5x3.0mtr
EV 3W with Li -Ion battery and Charger
3.5x1.5mtr
EV 2W With Li-Ion battery & Charger 2.0x0.9m
5m
6m
10m
4m