SPECIFICATION FOR GARAGE TOOLS & EQUIPMENTS

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1 Dent Puller

1.1 Basic Indicative Diagram

1.2 Pneumatic Dent Puller with 1.1 Kg hammer face
1.3 Heavy duty suction cups
1.4 Kit should contain the following:
- 1.4.1 Suction Cup Ø 75 mm
- 1.4.2 Suction Cup Ø 100 mm
- 1.4.3 Suction Cup Ø 125 mm
- 1.4.4 Hook

1.5 Suitable compressed air will be provided by institute

2 Denting Hammer Kit

2.1 Basic Indicative Diagram

2.2 Tools should be inside the hard foam so that the tools are in its place when placed back after usage

2.3 Should consists of

- 2.3.1 Punch & Chisel – Set of 5 No.s
  - 2.3.1.1 Chrome plated for corrosion resistance,
  - 2.3.1.2 Should be heat treated
- 2.3.2 Ball pin hammer-200 grams
  - 2.3.2.1 Head material is medium carbon steel with black baked paint finish,
  - 2.3.2.2 Normal polished on striking face
- 2.3.3 Soft face hammer - 300 mm
  - 2.3.3.1 Combination steel and soft face dead blow,
  - 2.3.3.2 One-piece urethane or equivalent construction

2.4 The set should be in the hard plastic/ metal box

3 Denting Kit Set

3.1 Basic Indicative Diagram

3.2 Should consists of

- 3.2.1 Bumping Hammer - 1 No.
  - 3.2.1.1 Extra large faces for large area work
  - 3.2.1.2 Serrated for shrinking and smooth for finishing
- 3.2.2 Pick and Finish Hammer 1 No.:
  - 3.2.2.1 For bumping when filing or where metal is covered with sound-proofing material
- 3.2.3 Curve Dolly - 1 No.
  - 3.2.3.1 For dinging flat surfaces,
  - 3.2.3.2 Measures 4 3/4" x 2 1/4" x11/16", 1000 Grams
- 3.2.4 Double End Dolly - 1 No.
  - 3.2.4.1 For use in sharp corners and wide radii,
  - 3.2.4.2 Measures 3" x 2 1/4" x1 3/8"; 800 Grams
- 3.2.5 Shrinking Dolly - 1 No.
  - 3.2.5.1 For deep, skirted fenders and shrinking when using heat,
  - 3.2.5.2 Measures 3" x 2 1/4" x 1 3/8", 800 Grams
- 3.2.6 Utility Dolly – 1 No.
  - 3.2.6.1 Essential for supporting irregular shapes and contours on doors, fenders, and other body panels,
  - 3.2.6.2 Thin profile to get in tight areas, should not scratch surface; 3 3/4" W x 5 3/4" L

3.3 The set should be in the hard plastic/ metal box

4 Multi Scan Tool - Petrol and Diesel Engine

4.1 Basic Indicative Diagram

4.2 Multi Scan Tool with Android based operating system. Should have display of minimum size 10" sunlight readable touch screen with CPU of 1.2 GHZ quad core and 2GB Ram. Memory capacity should be of min 16 GB to accommodate entire diagnostic software application and diagnostic data. At least 7000 mAH lithium polymer Battery.

4.3 Should have front and rear camera for taking photo of components.

4.4 Should have wireless Connectivity with car.

4.5 Should have solid and rigid design.

4.6 Should have demo mode to teach students diagnostic functionality without actually connecting car with scanner.

4.7 Should connect with wireless printer supplied with scanner to print the trouble codes.

4.8 Should have a function of recording live data streaming which can be played at any time.

4.9 Should have actuation test functionality to test component without running the engine.

4.10 Should support freeze frame data function.

4.11 Should allow access to diagnostic community.

4.12 Customer management for the workshop.

4.13 Special functions: key matching, key coding, key programming, battery reset, break reset

4.14 Remote diagnosis & maintenance.

4.15 4 channel oscilloscope to show result of vehicle's sensor or actuator circuits and visualizes the signals in the graphic waveforms in scanner's hardware itself.

4.16 Should have all diagnostic adaptor for all Asian, European and USA brands available in India

4.17 One click update online via Wi-Fi.

4.18 Built in car repair procedure data base and car repair tips application at least for Indian cars.

4.19 Should have digital multi meter function that performs the measurement of voltage, resistance, frequency and display it in scanner screen itself.

4.20 Should have function of sensor testing by sensor simulation test like manually drawn waveform simulation test, predefine sensor's waveform simulation test, DC voltage simulation test, frequency simulation test etc. to find engine sensor faults quickly.

4.21 Manual should be provided in English all Indian and Imports vehicles.

4.22 Fault finding manual all Indian and Imports vehicles.

5 Ultrasonic Injection Cleaning Equipment

5.1 Basic Indicative Diagram

5.2 Functions

5.2.1 Uniformity/ Sprayability Test: Should be able to test the uniformity of injecting amount of each injector, and to monitor the spraying status of each injector with the help of backlight.

5.2.2 Leakage Test: Should be able to test the sealing and dribbling conditions of injectors under system pressure.

5.2.3 Injecting flow test: Should be able to check the injecting amount of the injector in 15 seconds of constant injection.

5.2.4 Auto test: Should be able to test injectors by simulating different working conditions.

5.2.5 Ultrasonic cleaning: Should be able to perform simultaneous cleaning on several injectors and to remove the carbon deposits on the injector completely.

5.2.6 On-vehicle cleaning: The unit should be equipped with various adaptors and couplers that facilitate cleaning on the injectors on vehicle.

5.3 Features

5.3.1 It Should be suitable for all EGI (Exhaust Gas Ignition) vehicles and should help to achieve automatic cleaning and testing of injectors.

5.4 Working conditions:

5.4.1	Temperature:	-10 ～ +45 Degree Celsius
5.4.2	Relative humidity:	< 85%
5.4.3	Intensity of outer magnetic field:	< 400A/m
5.4.4	No naked flame within:	2 meter

5.5 Specifications:

5.5.1	Main unit power supply:	AC 220V ± 10%, 50 Hz
5.5.2	Ultrasonic cleaner power:	100W
5.5.3	Simulated RPM Range:	10 ～ 9990 RPM; Step: 10 RPM
5.5.4	Time range:	1～9999s
5.5.5	Pulse width:	0.5～25ms; Step 0.1 ms
5.5.6	Fuel tank capacity:	3500 to 4000ml (± 10%)
5.5.7	Dimensions:	400mm X 400mm X 600mm; (± 10%)
5.5.8	Weight:	30 Kg (± 10%)

6 Compression Testing Gauge - Suitable for Diesel Engine with Standard Accessories

6.1 Basic indicative diagram

6.2 Quick-connect adapter Push pressure scale: 0 <> 1000 PSI, 0 <> 7000 KPA
6.3 Reads pressure from 0 to 1000 PSI
6.4 2-9/16" diameter gauge
6.5 Thumb button air release
6.6 Should be supplied with adapters for Suzuki, Hyundai, GM, Ford, Isuzu, Mercedes, Toyota, Volkswagen & Peugeot.
6.7 All above items should be placed secured in a blow molded plastic box or metal box

7 Two Post Car Lift – Capacity 4 Ton, Electric Operated

7.1 Basic Indicative Diagram

7.2	Paint:	Powder coat mat finish
7.3	Mechanical lock:	Single point lock release
7.4	Arm Lock:	Spring loaded lock
7.5	Arm Adaptor:	Standard and 10" extension adaptor
7.6	Arm Design:	Symmetric design
7.7	Post Design:	Symmetric design
7.8	Piston:	Direct drive hydraulic piston for fast and steady operation

7.9 **Technical specification**

7.9.1	Lifting Capacity:	4 Tons
7.9.2	Over all Height:	3500 mm ± 5 %
7.9.3	Over all Width:	3500 mm ± 5 %
7.9.4	Under Bar Clearance:	3300 mm ± 5 %
7.9.5	Inside Column Distance:	2800 mm ± 5 %
7.9.6	Load Distribution:	1: 1
7.9.7	Lifting Time:	< 45 seconds.
7.9.8	Drive through clearance:	2500 mm ± 5 %
7.9.9	Maximum lifting height:	1800 mm ± 5 %

7.10 **Lifting arm adjustment**

7.10.1	Max / Min Front:	780 / 1140mm ± 5 %
7.10.2	Max / Min Rear:	780 / 1140mm ± 5 %
7.10.3	Power Supply:	380 V AC, 3 Phase, 50Hz
7.10.4	Motors:	3.0 HP

8 Radiator Pressure Tester

8.1 Basic Indicative Diagram

8.2 Reduces system filling time, eliminates airlocks and checks for system leaks
8.3 Compact size allows access in restricted under hood areas
8.4 Cone adaptor ensures unit will work on most Indian passenger vehicles and light trucks
8.5 Push-button control valve should be provided to eliminates the need to interchange hoses
8.6 Shop air (90 PSI) to quickly draw a powerful vacuum
8.7 Should eliminates system bleeding and purging
8.8 All above items should be placed secured in a blow molded plastic box or metal box

9 Glow Plug Tester

9.1 Basic Indicative Diagram

9.2 Should enable fast diagnosis of glow plug failure or degradation without the need to disassemble the plug from the engine.

9.3 Suitable for any 12 Volt DC vehicle system.

9.4 Should connect directly to vehicle battery.

10 Tyre Changer Machine

10.1 Basic Indicative Diagram

10.2 Turn table

10.2.1	Inside clamping capacity:	12 - 24"
10.2.2	Outside clamping capacity:	10 - 22"
10.2.3	Maximum Tyre diameter:	1000 mm
10.2.4	Maximum Tyre width:	13"
10.2.5	Rotation Speed:	6.8 RPM
10.2.6	Bead Loosener Range:	70-340 mm
10.2.7	Clamping Cylinders:	2
10.2.8	Motor Power:	0.75 HP

10.3 Mounting Tool

10.3.1	Column:	Fixed
10.3.2	Head clamping:	Manual
10.3.3	Power Supply:	Single Phase, 230V
10.3.4	Operating Pressure:	8 -10 Bar
10.3.5	Number of Pedals	3

10.4 Accessories

10.4.1	Tyre Lever:	Yes
10.4.2	Plastic protection for Mounting Nose:	Yes
10.4.3	Manual Inflator:	Yes
10.4.4	FRL:	Yes

11 Tyre Pressure Gauge with Holding Nipple

11.1 Basic Indicative Diagram

11.2 Easy change chuck system
11.3 1 button operation
11.4 Auto shut-off for increased battery life
11.5 Displays KgF, BAR, PSI, KPA measurements
11.6 Large face LCD digital read-out
11.7 Unit covered with rubber sleeve for extra comfort and durability
11.8 ON power Button, auto shut off in 90 seconds if not in use
11.9 LCD backlight
11.10 2-position lever – 1st position deflates, 2nd position inflates
11.11 With 21" hose
11.12 2 AAA batteries

12 Wheel Alignment Machine - Computerized 3D

12.1 Basic Indicative Diagram

12.2	Measurement System:	True 3D modeling of vehicle spindle Plane
12.3	Camera support configuration:	Fixed Beam.
12.4	Installation Configuration:	Suitable in Wheel alignment PIT as well as the Alignment lift
12.5	Wheel Clamp Range:	Rim clamp - self centering clamp 11" to 22"
12.6	Measuring Range	
12.6.1	Track Width:	48 to 96"
12.6.2	Wheel Base:	79" to 180"
12.6.3	Individual Toe:	± 35 degree
12.6.4	Camber:	± 55 degree
12.6.5	Caster & SAI:	± 30 degree
12.7	Toe out on turns	
12.8	Hardware:	2 Camera version with PC
12.9	Software:	Window based application software
12.10	System Footprints:	Turn table center to camera system front 82" - 111"

12.11	**Accuracy & Range**	**Accuracy**	**Range**
	12.11.1 Camber	0.05 deg	55 deg
	12.11.2 Caster	0.08 deg	30 deg
	12.11.3 Kingpin	0.08 deg	30 deg
	12.11.4 Toe	0.04 deg	35 deg
	12.11.5 Setback	2.5mm/0.1"	
	12.11.6 Thrust Angle	0.02 deg	35 deg
	12.11.7 Included Angle	0.13 deg	30 deg
	12.11.8 Lock Angle	0.06 deg	35 deg
	12.11.9 Toe out Turn	0.03 deg	measured at 20 deg

12.12	Power Supply:	230 VAC, 1Phase, 50 Hz
12.13	Display Type:	Monitor
12.14	Should be supplied with Printer, Set of 4 clamps and targets	
12.15	Machine Weight:	70 Kgs (± 10 %)
12.16	Suitable in Wheel alignment PIT will be provided by the institute.	
12.17	Supplier has to submit necessary drawing in advance.	
12.18	Fixed 3D Camera Beam - 3D Imaging Alignment technology,	
12.19	Four Wheel alignment	
12.20	Two camera technology	
12.21	Suitable to measure caster, camber, sai and rear toe and camber	

13 Wheel Balancing Machine

13.1 Basic Indicative Diagram

13.2	Max Wheel Weight:	60 Kg
13.3	Rim Diameter:	12” ~ 22”
13.4	Rim Width:	1.5” ~ 16”
13.5	RPM:	200 RPM
13.6	Accuracy:	2 Grams

13.7 Features

- 13.7.1 Optimization
- 13.7.2 Hidden Weight
- 13.7.3 5 Alloy Modes
- 13.7.4 Motorcycle Mode
- 13.7.5 Real plane imaging (RPI) technology
- 13.7.6 Required wheel guard

14 Air Conditioning Service Unit - Car

14.1 Basic indicative diagram

14.2	Service Processes	
14.2.1	Refrigerant Extraction and Recycling:	Fully Automatic
14.2.2	Draining Old Oil :	Automatic
14.2.3	Evacuation/ Creating Vacuum:	Automatic
14.2.4	Vacuum Check / Leak Check:	Automatic
14.2.5	Fresh Oil Filing:	Automatic
14.2.6	Refrigerant Filing:	Automatic
14.3	Operation and Display	
14.3.1	Process Control:	User friendly display
14.3.2	Display:	LCD 98X39
14.3.3	Pressure Gauge for HP/LP (100 mm):	Should be available
14.3.4	Manual Evacuation Time Adjustment:	Should be available
14.3.5	Status Display:	72 A/audio
14.3.6	Maintenance Tasks Display:	Static Diagnosis
14.3.7	Printer:	Should be provided
14.3.8	UV dye injection should be provided	
14.4	Recovery/ Recycling/ Recharge	
14.4.1	Refrigerant:	R134a
14.4.2	Internal Reservoir (Refrigerant Bottle):	12 liters
14.4.3	Compressor:	1/3HP
14.4.4	Vacuum Pump Power:	72 L/min
14.4.5	Refrigerant Filling Accuracy:	± 10 gm
14.5	General Equipment Data	
14.5.1	Power Supply:	230 V
14.6	Standard Accessories	
14.6.1	Service Hoses HP/LP	
14.6.2	Quick Connectors HP/LP	
14.6.3	Oil Bottles - 2 Nos.	

15 Automotive Battery Charger

15.1 Basic Indicative Diagram

15.2	Input:	230 V AC / 50 HZ
15.3	Charging Mode:	Manual
15.4	Output:	6/12 V
15.5	Charging current:	2/10/40 A
15.6	Boost/Start:	200 A
15.7	Meter Display should be available	
15.8	Adapter battery capacity range:	4-400 AH
15.9	Adapter battery:	GEL/AGM/STD lead battery
15.10	12V FUL detection	
	15.10.1 GEL Model:	Voltage > 13.8 ± 0.2V & Current < 0.8 ± 0.5A, FUL
	15.10.2 AGM Model:	Voltage > 14.8 ± 0.2V & Current < 0.8 ± 0.5A, FUL
	15.10.3 STD Model:	Voltage > 14.5 ± 0.2V & Current < 0.8 ± 0.5A, FUL
15.11	6V FUL detection	
	15.11.1 GEL Model:	Voltage > 6.9 ± 0.3V & Current < 0.8 ± 0.5A, FUL
	15.11.2 AGM Model:	Voltage > 7.4 ± 0.3V & Current < 0.8 ± 0.5A, FUL
	15.11.3 STD Model:	Voltage > 7.2 ± 0.3V & Current < 0.8 ± 0.5A, FUL

16 Automotive Battery Tester/ Analyser

16.1 Basic Indicative Diagram

16.2 Should have integrated thermal printing facility.
16.3 Should be designed for testing all types of 6V and 12V starter batteries, including Lead Acid, Gel and AGM,
16.4 Bad cell detection capability.
16.5 Should have voltmeter mode for testing both the Starter and the Charging System, Anti-sparking clamps for safe operation.
16.6 Should have Back-Lit Display, 4 Lines 16 Characters LCD for easy viewing.
16.7 Button layout and housing design should allow for one-handed operation.
16.8 Test Range: 100-1400 CCA (Cold Cranking Amps)
16.9 Starter system testing: Pressing the down arrow should display the captured voltage from cranking the engine.
16.10 Charging system testing: Pressing the up arrow should display the captured high voltage from the alternator.
16.11 Detachable Test Lead: 50cm/2”
16.12 Screen Size: 75mm x 40mm (± 5%)
16.13 Voltmeter: 7.6V ~ 17V via Battery Clamp
16.14 Clamp Size: 90 mm
16.15 Weight: 500 Grams (± 5%)

17 Battery Terminal Cleaner Tool

17.1 Basic Indicative Diagram

17.2 Length: 3 - 3/8 inch
17.3 Stiff wire bristles

18 Air Blow Gun with accessories

18.1 Basic Indicative Diagram

18.2 Die Cast Al construction
18.3 Extended 9 inch X ø 6.2mm(ID) long aluminum tube
18.4 1/2 inch rubber tip
18.5 5m polyurethane coil Hose, Kink resistant & lightweight
18.6 Hose ID ø 5mm, Hose OD ø 8mm; ¼ inch Threads
18.7 Hose material PUR - Ester
18.8 Hose Hardness 98 Shore 'A'
18.9 Polyacetal bend restrictors
18.10 Burst Pressure 508PSI (35 Bar)
18.11 Crimped with solid brass swivel (360°) with quick change connector of Steel construction with standard seal material suitable for air application
18.12 Compressed air pressure less than 30 PSI when outlet blocked
18.13 Solid Brass swivel fittings at both ends offer 360° rotation
18.14 Noise level should be <85dBA
18.15 Each gun should includes hanging hook and paddle-type air control lever
18.16 Variable flow trigger for precise air flow control
18.17 Six-outlet "star tip" delivers an even distribution of air
18.18 4" Full Flow tube and ergonomic handle for increased comfort
18.19 Triggers regulate airflow from partial to full line pressure
18.20 Maximum Working Pressure: 175 PSI (12 bar)
18.21 Should comply with OSHA safety standards
18.22 Valve should have no cutoff and no restrictions
18.23 Each tip should be side vented
18.24 Air Inlet: 1/4" NPT

19 Air Impact Wrench with Impact Sockets

19.1 Basic Indicative Diagram

19.2 ½ Inch Sq. drive Impact Wrench,
19.3 Handle Housing Material: Aluminum, Front case material: Steel
19.4 Max. Torque-745 Nm (@15s)
19.5 Air Inlet ¼ inch , Net Weight 2.3 kg max (± 10%)
19.6 Air consumption 4 CFM max.
19.7 Twin hammer mechanism with front Exhaust
19.8 3 speed position control to adjust tool speed
19.9 ½ Inch 14 Piece Cr Mo impact socket set: 10mm, 11mm, 12mm, 13mm, 14mm, 15mm, 16mm, 17mm, 18mm, 19mm, 21mm, 22mm, 24mm
19.10 Impact sockets in Blow Mould Case
19.11 Hardness of Impact sockets 38 - 55 HRC with Super Grip Profile
19.12 Black Oxide Finish
19.13 Torque: 1.5X ANSI/1.3X DIN
19.14 Brand & Size etched on each individual socket to ensure quick & convenient identification
19.15 ½ Inch (F) to 3/8 inch (M) impact reducer adaptor with same material construction as of impact sockets.

20 Engineers Stethoscope

20.1 Basic Indicative Diagram

20.2 Should be able to locate noises in engines or bearings and other moving parts
20.3 High quality surgical grade PVC and rubber parts for increased sound definition
20.4 Plastic ear pieces to minimize outside noise with aluminium alloy probe / needle for finding exact location of specific noises
20.5 Sensor clamp helps to detect noises during test drives that can not be duplicated in the work bay
20.6 Sensor tip mounted on 6” flexible shaft allows access to hard-to-reach areas
20.7 5" inductive metal probe allows user to pinpoint source of noise or vibration
20.8 Ultra sensitive microphone provides a full range of sound
20.9 Rotary volume control allows easy adjustment
20.10 Ear-bud style earphones provide excellent sound quality

21 Grease Gun - 500 grams

21.1 Basic Indicative Diagram

21.2 150 mm rigid Steel extension & 4 jaw coupler
21.3 Aluminium die Cast grease gun head with built - in release wall
21.4 Soft Rubber grip on lever handle
21.5 Powder Coated Body
21.6 Delivers: Upto 1 Gram/ Stroke
21.7 Develops: Upto 6,000 PSI
21.8 500 gms Bulk Capacity/ 400gms with Cartridge

22 Oil Can - 500 ml

22.1 Basic Indicative Diagram

22.2 Metal Oil can with 500ml Capacity
22.3 150 mm rigid Steel spout
22.4 Tin coated Steel body with premium powder coated finish
22.5 Steel pump with double ball check
22.6 Discharge of 16 - 18 ml per 10 strokes with general Mobil oil

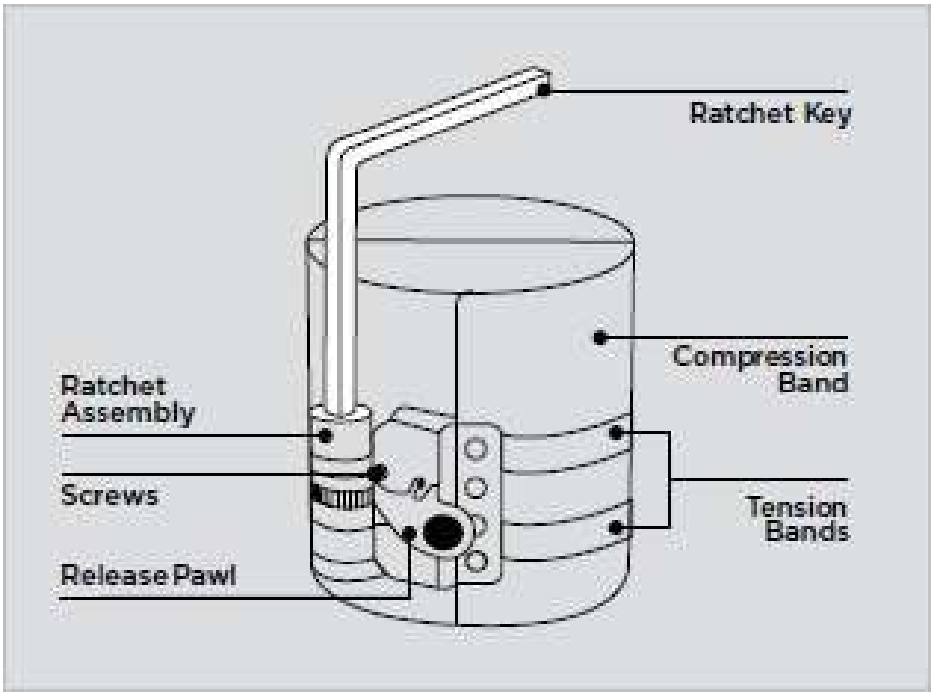
23 Oil Filter Wrench - upto 500 mm

23.1 Basic Indicative Diagram

23.2 Oil filter wrench with strap Length 500mm min.
23.3 Comfortable Vinyl Grip
23.4 Compatible for Engine oil filter upto ø 4 inch (100mm)
23.5 Should be Plated Steel body

24 Piston Ring Compressor - 50 - 100 mm

24.1 Basic Indicative Diagram



24.2	Material:	High Grade Spring Steel
24.3	Minimum Ring Diameter:	50 mm
24.4	Maximum Ring Diameter:	125 mm
24.5	Height:	75 mm
24.6	Comes with Ratchet key	
24.7	Friction proof edges	

25 Piston Ring Expander and Remover - 50 - 100 mm

25.1 Basic Indicative Diagram

25.2	Capacity:	ø 50 - 100 mm
25.3	Overall Length:	215mm
25.4	Material:	High Grade Special Tool Steel
25.5	Finish:	Bright Nickel Plated

26 Piston Ring Groove Cleaner

26.1 Basic Indicative Diagram

26.2 Handles pistons ø 1 inch to 5 inch

26.3 For pistons with grooves of sizes i.e. cutter wheel sizes

- 26.3.1 5/64 inch
- 26.3.2 3/32 inch
- 26.3.3 1/8 inch
- 26.3.4 5/32 inch
- 26.3.5 3/16 inch

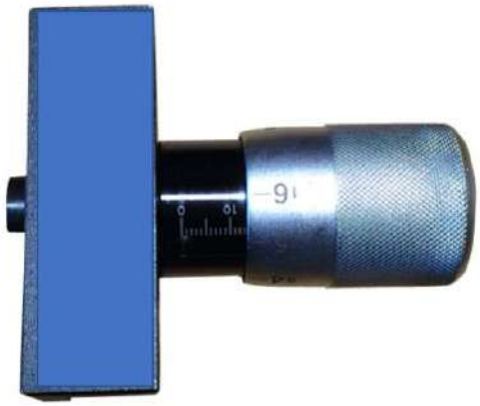
27 Suspension Coil Spring Compressor - Pair

27.1 Basic Indicative Diagram

27.2 Drop forged Cr Mo Steel jaws and lead screws (370mm)
27.3 CR - MO Construction
27.4 Should be able to use with 21mm wrench or 1/2 inch square drive tools
27.5 Should be able to wrap coil claws for safety

28 Belt Tensioner Gauge

28.1 Basic Indicative Diagram



28.2 Should be used to measure and set the tension of the cam belt
28.3 Should be used on vehicle belts where the manufacturer specifies the timing belt tension to be set at a specific location on the belt span between pulleys
28.4 Should have clear incremental markings with knurled knob for accurate measurement
28.5 Should speed up timing belt installation
28.6 Readings should be provided in Nm
28.7 Should be suitable for belts with a widths between 2 and 8 mm
28.8 Should be supplied in a foam inlay box
28.9 Length: 95 mm (± 10%)
28.10 Width: 80 mm (± 10%)
28.11 Height: 40 mm (± 10%)
28.12 Weight: 0.35 Kg (± 10%)