

**TPMS service product range for tyre pressure control systems**

- The entire valve service set of the sensor must be replaced with every tyre change or tyre service
- Consists of valve insert and cap, gasket and sealing ring, union nut and (sometimes) marking ring
- Suitable for the most common European combinations of valve and TPMS sensor
- Assigned using the features of manufacturer, model and year
- All parts required for a repair are included
- Suitable for steel or aluminium rims
- In durable plastic storage case



149.0200	142 pcs	TPMS service product range for tyre pressure control systems	900
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consists of:

X			
149.1010	8	TPMS service set for tyre pressure control systems 10	8
149.1011	8	TPMS service set for tyre pressure control systems 11	5
149.1012	8	TPMS service set for tyre pressure control systems 12	5
149.1013	8	TPMS service set for tyre pressure control systems 13	6
149.1014	8	TPMS service set for tyre pressure control systems 14	6
149.1015	8	TPMS service set for tyre pressure control systems 15	5
149.1017	8	TPMS service set for tyre pressure control systems 17	6
149.1018	8	TPMS service set for tyre pressure control systems 18	9
149.1023	4	TPMS service set for tyre pressure control systems 23	17
149.1026	4	TPMS service set for tyre pressure control systems 26	22
149.1027	4	TPMS service set for tyre pressure control systems 27	17
149.1028	4	TPMS service set for tyre pressure control systems 28	16
149.1029	4	TPMS service set for tyre pressure control systems 29	19
149.1030	4	TPMS service set for tyre pressure control systems 30	19

**THREAD REPAIR**

**Thread fil , metric**

- For the restoration of defective internal and external threads
- Suitable for right and left handed threads
- Two sided serviceable
- Special steel

Suitable for thread pitch: 0.8 - 3.0 mm



150.1340	L mm	130
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**Thread fil , imperial**

- For the restoration of defective internal and external threads
- Suitable for right and left handed threads
- Two sided serviceable
- Special steel

Suitable for thread pitch: 24 - 10 pitch imperial



150.1345	L mm	130
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**Wheel bolt thread repair set**

- For re-cutting and cleaning damaged outer threads
- Ideal composition for wheel bolts
- Ideally suited for hard to reach areas
- Outer hexagonal head drive 24 mm
- Right hand cutting
- High performance steel
- In durable plastic storage case



150.1335	4 pcs	Wheel bolt thread repair set	250
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consists of:

150.1336	Drive tool	104
150.1337	Threading die M12 x 1.25	21
150.1338	Threading die M12 x 1.5	21
150.1339	Threading die M14 x 1.5	21

**Wheel nut thread repair set**

- For re-cutting and cleaning damaged inner threads
- Ideal composition for wheel nuts and wheel hub thread
- Ideally suited for hard to reach areas
- Outer hexagonal head drive SW 12
- Right hand cutting
- High performance steel
- In durable plastic storage case



150.1395	3 pcs	Wheel nut thread repair set	270
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consists of:

150.1397	Thread cutter M12 x 1.25	58
150.1398	Thread cutter M12 x 1.5	60
150.1399	Thread cutter M14 x 1.5	65

**Wheel bolt thread repair set**

- For the repair of internal and external threads
- Ideal for drive shafts, lambda probes, wheel bolts, etc.
- Correct thread repair for damaged or sliced threads
- Suitable for a wide range of applications
- Drive optional with t-handle or external hexagon drive
- In durable plastic storage case



150.1470	9 pcs	Thread repair set	1.37
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consists of:

150.1466	T bar, 8x80mm	30
150.1471	Thread chaser for M14 x 1.5 for male and female threads	150
150.1472	Thread chaser for M16 x 1.5 for male and female threads	80
150.1473	Thread chaser for M18 x 1.5 for male and female threads	90
150.1474	Thread chaser for M20 x 1.5 for male and female threads	120
150.1475	Thread chaser for M22 x 1.5 for male and female threads	150
150.1476	Thread chaser for M24 x 1.5 for male and female threads	170
150.1477	Thread chaser for M27 x 2.0 for male and female threads	180
150.1478	Thread chaser for M28 x 1.5 for male and female threads	200

**Thread tapping set for wheel screws and threads**

- For re-cutting and cleaning damaged inner and outer threads
- Ideal composition for wheel nuts and bolts
- Slim design
- Ideally suited for hard to reach areas
- Square drive as per DIN 3120/ISO 1174 with backstop groove
- Tolerance as per ISO 2/6H or 6g
- Right-cut
- With TIN-coated surface
- High performance steel
- In durable plastic storage case



150.1420	11 pcs	Thread tapping set for wheel screws and threads	1.20
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consists of:

150.1421	HSS TIN tap, M12 x 1.25	34
150.1422	HSS TIN tap, M12 x 1.50	36
150.1423	HSS TIN tap, M14 x 1.50	57
150.1424	HSS TIN threading die, M12 x 1.25	66
150.1425	HSS TIN threading die, M12 x 1.50	68
150.1526	HSS TIN threading die, MF14 x 1.50	68
150.1527	3/8" socket for tap, 7 mm	30
150.1428	3/8" socket for tap, 9 mm	34
150.1419	3/8" threading die adapter	280
301.0095	Thread gauge, metric, 20 blades	40
151.1240	Key wrench hex, long, 3mm	10

### Thread chaser for outside thread, Ø 25 - 140 mm

- For re-cutting and cleaning damaged outer threads Ø 25 - 140 mm
- Very large application range due to 6 supplied plates
- No damage to the thread due to soft support and guide jaw
- Suitable for right and left-handed thread
- Variable adjustment
- Can be used everywhere regardless of the thread length
- The chaser is well-guided due to the width of the jaw and does not tilt
- Quick conversion possible through threading die change
- Special steel

Metric: 1.0 - 1.25 - 1.5 - 1.75 - 2.0 - 2.5 - 3.0 - 3.5 mm  
 Imperial: 24 - 20 - 18 - 16 - 14 - 12 - 11,5 - 11 - 10 - 9 - 8 - 7,5 - 7 - 6 - 5 - 4 pitch/imperial



	Ø mm	Replacement jaws mm	Replacement jaws inch	Weight
150.1430	25,0 - 140,0	150.1431	150.1432	1,40

### PROFILE DEPTH MEASURER

#### Tyre profile depth gauge 0 - 30 mm

- Glare-free reading
- For depth measurements
- Reading 0.1 mm steps for accurate profile depth determination
- Very handy and light
- Sturdy design
- Made of hard brass



	Measuring range mm	L mm	Depth accuracy mm	Weight
300.0537	0 - 30	105,0	±0,01	62

#### Digital tyre profile depth gauge 0 - 25 mm

- In accordance with DIN 862
- Locking screw
- For depth measurements
- mm/imperial switching
- Reset (to zero) in every position possible
- Large LCD display figure height 8.0 mm
- Little energy consumption through automatic switching off
- Entirely hardened, finely engineered
- Stainless steel
- In durable plastic case



	Measuring range mm	A mm	L mm	Display accuracy mm	Weight
300.0550	0 - 25	40,0	125,0	±0,03	100

### Digital tyre pressure and thread gauge

- Precise and repeatable LCD measurement
- For depth measurements
- For tyre pressure measurements
- Measurement with acoustic signal
- Pressure measurement range can be switched between bar, kpa and PSI
- Low energy consumption due to automatic shutdown
- Includes batteries, key chain and belt clip



	Measuring range bar	Profile depth, made in mm	Weight
100.4060	0,15-9,50	0,0-15,0	90

### WHEEL FILLING GAUGE

#### Digital tyre pressure tester

- Precise and repeatable LCD measurement
- For tyre pressure measurements
- Measurement with acoustic signal
- Pressure measurement range can be switched between bar, kpa and PSI
- Low energy consumption due to automatic shutdown
- Includes batteries



	Measuring range bar	Length mm	Weight
100.4065	0,15-7,00	128,0	45

### Digital tyre pressure and thread gauge

- Precise and repeatable LCD measurement
- For depth measurements
- For tyre pressure measurements
- Measurement with acoustic signal
- Pressure measurement range can be switched between bar, kpa and PSI
- Low energy consumption due to automatic shutdown
- Includes batteries, key chain and belt clip



	Measuring range bar	Profile depth, made in mm	Weight
100.4060	0,15-9,50	0,0-15,0	90

### Tyre fill nipple with rocker arm

- For hose receptacle Ø 6 mm
- Nipples for tyre filling gauge with rocker arm
- Mounting via hose clamp



	Ø mm	Weight
100.5060	6,0	50

### Tyre filling gauge

- For one hand operation
- Rubber coated manometer
- Manometer with bar and psi scale
- Filling lever and pressure release button
- Tube with integrated locking male nipple
- Robust rubber coated housing



#### Technical data:

Working range: 0 - 11 bar  
 9 - 160 psi  
 Tube length: 490 mm  
 Operating pressure: max 6,3 bar (90 psi)  
 Connection thread: 1/4"PT

	Total length mm	Weight
515.1950	530,0	600

### Calibrated tyre filling gauge

- For one handed operation with ergonomic design
- Rubber coated manometer
- Manometer with bar scale
- With filling lever and pressure release button
- Tube with integrated locking male nipple
- Hanging hole
- Includes 1/4" coupling connector
- Robust rubber coated housing



#### Technical data:

Working range: 0 - 10 bar  
 Tube length: 400 mm  
 Operating pressure: max. 6,3 bar (90 psi)  
 Connection thread: 1/4"PT

	Total length mm	Weight
515.1960	600,0	450



**Tyre filling gauge**

- For one hand operation
- With rubber coated manometer
- Manometer with bar and psi scale
- With filling lever and pressure release button
- Tube with integrated locking male nipple
- Robust rubber coated housing



**Technical data:**

Working range: 0 - 15 bar  
0 - 220 psi  
Tube length: 350 mm  
Operating pressure: 11 bar (160 psi)  
Connection thread: 1/4"PT

Total length mm		Weight g
515.1905	500.0	120

**Digital tyre filling gauge**

- For one-handed operation
- With rubber coated display
- Manometer with digital display
- With filling lever and pressure release button
- Hose with integrated instant plug nipple
- With automatic switch-on and off
- Large LCD display
- Includes 1/4" coupling plug
- Switchable: Bar, PSI, KPA, Kg/cm<sup>2</sup>



**Technical data:**

Working range: 0 - 14 bar  
0 - 200 psi  
Battery: 2x 1.5V (AAA)  
Tube length: 500 mm  
Operating pressure: max. 6.3 bar (90 psi)  
Working temperature: -15°C to +60°C  
Connection thread: 1/4"PT

Total length mm		Weight g
515.1970	680.0	490

**MOUNTING LEVER**

**Tyre lever with aluminium grip**

- Lightweight and thin tyre lever for comfortable working
- With aluminium handle
- Matt finish



L mm		Weight g
911.8170	530.0	620

**Tyre and assembly lever**

- Sturdy design
- Double-T profile provides for stability
- For mounting and removing tyres
- Extra rounded lever end for application that is gentle on materials
- Matt finish
- Chrome vanadium



L mm		Weight g
911.8143	200.0	120
911.8144	240.0	170
911.8145	280.0	200
911.8146	370.0	400
911.8180	650.0	1100

**Tyre iron for installing and removing tyres with replaceable plastic coating**

- Damage-free assembly and disassembly
- With wear resistant and replaceable plastic protection
- Sturdy design
- Double-T profile provides for stability
- For mounting and removing tyres
- Extra rounded lever end for application that is gentle on materials
- Matt finish
- Chrome vanadium



L mm		Weight g	Replaceable plastic coating
911.8199	500.0	770	911.8157

**Tyre and assembly lever**

- Sturdy design
- For mounting and removing tyres
- Extra rounded lever end for application that is gentle on materials
- Phosphate
- Chrome vanadium



L mm		Weight g
911.8147	535.0	600

**BEAD HOLD-DOWN DEVICE**

**Bead hold-down device for tyre mounting machines**

- Assembly and disassembly aid that is gentle on the rims
- Universally applicable bead hold-down device
- Sturdy way to press the upper tyre bead down into the rim wheel by hand
- Can be used in connection with all tyre mounting machines
- Ideal for the assembly of run flat tyres
- Much easier work due to lever action
- With sturdy handle
- Sturdy plastic



L mm		Weight g
911.8198	300.0	560

**Tyre bead hold-down device for tyre assembly**

- Assembly and disassembly aid that is gentle on the rims
- Universally applicable bead hold-down device
- Sturdy way to press the upper tyre bead down into the rim wheel
- Can be used in connection with all tyre mounting machines
- Ideal for the assembly of run flat tyres and low profile tyres
- Much easier work
- With sturdy handle
- Sturdy plastic

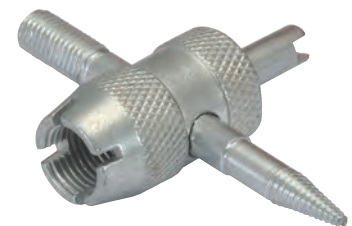


L mm		Weight g
911.8157	170.0	170

**VALVE BORING TOOLS**

**Valve thread repair tool**

- For the repair of damaged threads on external and internal valves
- Multi functional including ventilation and removal



L mm		Weight g
100.5050	Valve thread repair tool	20

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### Valve screw-in special profile socket for steel valves

- For the professional and easy installation and removal of steel valves
- Square drive as per DIN 3121/ISO 1174 with backstop groove
- With guide pin as safeguard against accidental slipping
- Fits perfectly in the counter contour of standard metal valves
- Tightening with torque is possible
- Phosphate
- Chrome molybdenum



	L mm	
150.2028	25.2	11

### Valve screwdriver

- Double-sided usable for short and/or long valves (VG5)
- Also suitable for use as a socket cap driver
- With plastic handle



	Suitable for	L mm	
150.2021	passenger cars and vans (VG5)	130.0	40

### Valve screwdriver

- Double-sided usable for short and/or long valves (VG8)
- Also suitable for use as a socket cap driver
- With plastic handle



	Suitable for	L mm	
150.2022	passenger cars, commercial vehicles and construction machines (VG8)	150.0	40

### Valve screwdriver, long

- Suitable for short and/or long valves usage (VG5)
- Also suitable for use as a socket cap driver
- With single component handle



	Suitable for	L mm	
150.2033	passenger cars and vans (VG5)	170.0	30

### Torque valve screwdriver 0,25 Ncm, long

- Ideal for short or long rubber sealing valve usage (VG5)
- Prevents the over tightening and damage of the rubber seal
- When torques is achieved, skips and can also be held audably
- Also suitable for use as a socket cap driver
- With single component handle



	Non	L mm	
150.2029	0,25	120.0	50

### Torque valve screwdriver 0,45 Ncm, long

- Ideal for short or long metal sealing valve applications (VG5)
- Prevents the over tightening and damage of the rubber seal
- When torques is achieved, skips and can also be held audably
- Also suitable for use as a socket cap driver
- With single component handle



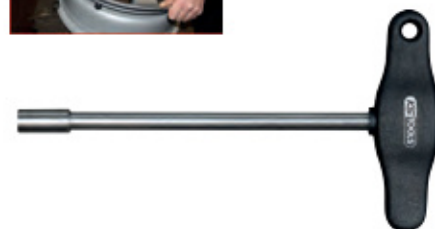
	Non	L mm	
150.2031	0,45	122.0	50



### VALVE LIFT

### Tyre valve puller

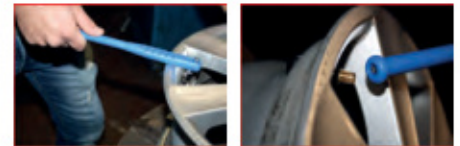
- For inserting rubber valves of all lengths in the rim hole
- Easy handling
- With dual component handle
- Prevents damage, since application without levers over the edge of the rim
- With T-handle
- Chrome plated and mirror polished
- Chrome vanadium



	L mm	
150.2139	180.0	95

### Plastic tyre valve mounting tool

- Easy handling
- For inserting rubber valves of all lengths in the rim hole
- Tilt joint prevents oblique insertion of the valve
- Snap-in notch for secure angle guidance
- Long lever arm for optimal force metering
- Soft plastic shaft prevents damage to aluminium rims
- Click mechanism of the head for quick screwing onto the valve
- Includes valve screw driver bit (VG5) on the handle end
- Plastic



	L mm	
150.2027	310.0	150

### Metal tyre valve mounting tool

- Easy handling
- For inserting rubber valves of all lengths in the rim hole
- Tilt joint prevents oblique insertion of the valve
- Snap-in notch for secure angle guidance
- Long lever arm for optimal force metering
- Protective rubber covering on the shaft prevents damage to aluminium rims
- Special steel

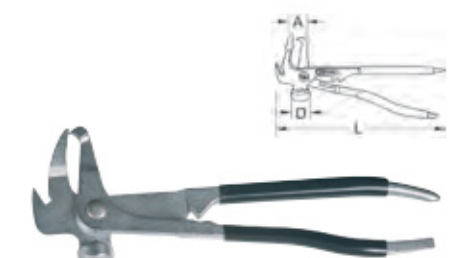


	L mm	
150.2032	330.0	310

### TYRE SERVICE PLIERS

#### Balancing weight pliers

- Sturdy design
- For fastening, loosening and cutting off the balance weights
- With 3 cm long blade for cutting wide adhesive weights
- Hammer head for striking the weights
- Also for expanding and compressing the retaining springs
- Handle ends suitable for discharging air or for removing hub caps
- With dip-insulated handles
- Matt finish
- Chrome vanadium

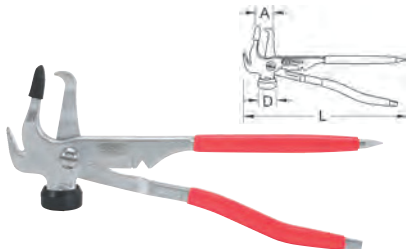


	A mm	D mm	L mm	
150.2025	26.0	22.0	250.0	450



**Balancing weight pliers with plastic protection**

- Sturdy design
- For fastening, loosening and cutting off the balance weights
- With 3 cm long blade for cutting wide adhesive weights
- Hammer head with plastic protection for striking the weights – especially painted weights
- Plastic protection cap prevents damage to aluminium rims
- Also for expanding and compressing the retaining springs
- Handle ends suitable for discharging air or for removing hub caps
- With dip-insulated handles
- Self-opening handle with internal spring
- Matt finish
- Chrome vanadium



	A mm	D mm	L mm	Weight icon
150.2024	32,0	28,0	250,0	380

**ADHESIVE WEIGHT REMOVER**

**Adhesive weight remover with saw blade**

- Ideal for protective disassembly of adhesive wheel weights on aluminium rims
- With flexible scraper and cutting edge
- Lever back flat side chisel form, cutting side with teeth
- Special lever for the removal of wheel weights
- Also suitable for the removal of labels, adhesive and type plates
- Surfaces are not damaged
- Sharpened with a file
- Solvent-resistant
- Special plastic



	L mm	B mm	Radius dimensions in mm	Weight icon
911.8111	200,0	25,0	38,0	20

**Adhesive weight remover set with saw cutting edge**

- Ideal for the gentle disassembly of adhesive weights on aluminium rims
- With flexible blunt scraper and cutting side
- Flat lever back, ground spade side, cutting side with saw radius
- Special lever for removing the adhesive weights
- Also for peeling off labels, adhesive signs and nameplate
- Surfaces are not damaged
- Re-grindable using a file
- Solvent resistant
- Special plastic



	Weight icon
911.8115 2 pcs 2 x 200 mm	800

**Adhesive weight remover**

- Ideal for the gentle disassembly of adhesive weights on aluminium rims
- With impact cap for light impacts
- Special shape of the bit handle ensures safe work
- With flexible blunt scraper and cutting side
- Special lever for removing the adhesive weights
- Also for peeling off labels, adhesive signs and nameplate
- Surfaces are not damaged
- Re-grindable using a file
- Solvent resistant
- Special plastic



	A mm	Weight icon
911.8131	19,0	130
911.8132	22,0	140
911.8133	26,0	150
911.8134	38,0	180

**Adhesive weight remover set**

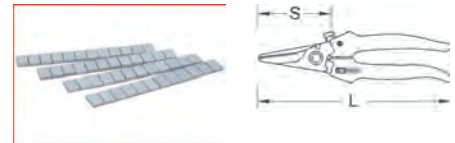
- Ideal for the gentle disassembly of adhesive weights on aluminium rims
- With impact cap for light impacts
- Special shape of the bit handle ensures safe work
- With flexible blunt scraper and cutting side
- Special lever for removing the adhesive weights
- Also for peeling off labels, adhesive signs and nameplate
- Surfaces are not damaged
- Re-grindable using a file
- Solvent resistant
- Special plastic



	Weight icon
911.8130 4 pcs 19 - 22 - 26 - 38 mm	570

**Adhesive weight shears with toothing**

- Toothing for cutting adhesive weights
- Self-opening
- With safety locking device
- Also for cutting gaskets
- With ergonomically shaped plastic handle



	Ø mm	L mm	S mm	Weight icon
118.0075	24,0	145,0	32,0	130



**Universal snap off blade knife**

- For right handed use
- Reinforcement eyelet
- Blade 9 x 80 mm
- 0.4 mm strong snap off blades
- Blade guide out of metal
- Housing made out of plastic
- Two component handle



	L mm	Weight icon
907.2152	140,0	907.2168 50

**TYRE FITTING GREASE**

**Round angled brush for tyre mounting paste**

- Screwed on brush
- 45° offset
- Ideal for mounting paste on the wheel rim
- Wood handle



	Ø mm	L mm	Weight icon
100.4020	45,0	400,0	250



You can find our wide range of knives and shears in our hand tool catalogue on page 536.

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### Tyre mounting paste 5 kg, white

- Ideally suitable for the dismantling and assembly of tyres with steel Light alloy and synthetic materials
- Preferred use with passenger cars and motor cycles
- Simply apply with a brush or a sponge on the wheel rim
- Optimal lubricating and bonding properties whilst protecting the tyre
- Releases the air out quickly which guarantees a strong bond in a short time the construction components
- Also suitable for wide tyres
- Supplied in a bucket

**Application range:** Passenger cars, small vans and motor-cycles



Article no.	Description	Weight
100.4010	Tyre mounting paste 5 kg, white	5.00

### Tyre mounting paste 5 kg, gold

- ideally suitable for the dismantling and assembly of tyres with Steel or aluminium rims
- For the dismantling and assembly of truck tyres with steel rims
- Simply apply with a brush or a sponge on the wheel rim
- Optimal lubricating and bonding properties whilst protecting the tyre
- Releases the air out quickly which guarantees a strong bond in a short time the construction components
- The professional black paste avoids staining as with the white paste
- Also suitable for wide tyres
- Supplied in a bucket

**Application range:** Trucks land and construction machines



Article no.	Description	Weight
100.4005	Tyre mounting paste 5 kg, gold	5.00

### Tyre mounting paste 5 kg, black

- Ideally suitable for the dismantling and assembly of tyres with steel or aluminium rims
- Preferred use with passenger cars and motor cycles
- Simply apply with a brush or a sponge on the wheel rim
- Optimal lubricating and bonding properties whilst protecting the tyre
- Releases the air out quickly which guarantees a strong bond in a short time the construction components
- The professional black paste avoids staining as with the white paste
- Also suitable for wide tyres
- Supplied in a bucket

**Application range:** Passenger cars, small vans and motor-cycles



Article no.	Description	Weight
100.4015	Tyre mounting paste 5 kg, black	5.00

### Crayon

- Smudge free
- Suitable to write on all surfaces
- Breakproof



Article no.	Colour code	Ø mm	L mm	Content	Weight
100.4050	Black	14.0	110.0	12	140
100.4045	Yellow	14.0	110.0	12	140

## TYRE REPAIR

### Tyre vulcanising repair set

- With 100 mm vulcanising thread
- Self-vulcanising material
- Easy handling
- Sturdy metal tool
- Ideal for the repair of stitch damage to treads of tubeless tyres
- Contains all tools needed for the repair
- Applicable in accordance with the valid guidelines for the repair of pneumatic tyres

**Application range:** passenger cars, motorcycles, vans, saloon cars



Article no.	Description	Weight
150.1070	5 pcs Tyre vulcanising repair set	900

consists of:

Article no.	Description	Weight
150.1071	Lubricant, 70 g	70
150.1072	60 Replacement strings 100 mm	190
150.1073	Needle short	110
150.1074	Rasp	110
150.1075	Break-off utility knife 9 mm	10

### Tyre vulcanising repair set

- With 178 mm vulcanising thread
- Self-vulcanising material
- Easy handling
- Sturdy metal tool
- Ideal for the repair of stitch damage to treads of tubeless tyres
- Contains all tools needed for the repair
- Applicable in accordance with the valid guidelines for the repair of pneumatic tyres

**Application range:** Vans, commercial vehicles, tractors, agricultural and construction machines



Article no.	Description	Weight
150.1080	5 pcs Tyre vulcanising repair set	900

consists of:

Article no.	Description	Weight
150.1071	Lubricant, 70 g	70
150.1082	30 Replacement strings 178 mm	190
150.1083	Needle long	110
150.1074	Rasp	110
150.1075	Break-off utility knife 9 mm	10

### SlimPOWER mini-pneumatic straight drill

- Straight design
- Air exhaust through the handle rear end
- For one handed operation with ergonomic design
- Not reversible
- With quick release chuck capacity 1 - 6.5 mm
- For hard to reach places
- Ideally suited for car bodywork and industrial working
- With stepless speed regulation
- Vibration dampened through double bearing guides
- Includes 1/4" coupling connector
- Robust housing



**Technical data:**

Chuck capacity:	1 - 6,5 mm
Chuck thread reception:	3/8" x 24 UNF
Capacity:	190 Watt
No load current:	6000 r.p.m.
Vibration:	< 0,7 ms <sup>2</sup>
Noise performance level:	95 dbA
Noise pressure level:	80 dbA
Air consumption:	240.66 l/min
Min. tube diameter:	1/4" - 4,8 mm
Operating pressure:	max. 5,5 bar (80 psi)
Connection thread:	1/4"NPT

Article no.	Ø mm	L mm	Weight
515.5020	35.5	145.0	400



**Pneumatic straight drill**

- Straight design
- Air exhaust through the handle rear end
- For one handed operation with ergonomic design
- Not reversible
- With quick release chuck capacity 0 - 10 mm
- For hard to reach places
- Ideally suited for car bodywork and industrial working
- With stepless speed regulation
- Number of revolutions adjustable through regulating screw
- Vibration dampened through double bearing guides
- Cold insulated handle
- Includes 1/4" coupling connector
- Ultra light robust housing from special plastic



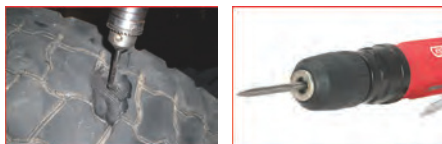
**Technical data:**

Chuck capacity: 1 - 10 mm  
 Chuck thread reception: 3/8" x 24 UNF  
 Capacity: 330 Watt  
 No load current: 2600 r.p.m.  
 Vibration: < 0,1 ms<sup>2</sup>  
 Noise performance level: 95 dbA  
 Noise pressure level: 82 dbA  
 Air consumption: 85 l/min  
 Min. tube diameter: 3/8" - 10 mm  
 Operating pressure: max. 6,3 bar (90 psi)  
 Connection thread: 1/4"NPT

	B mm	L mm	Weight
515.3025	44.0	215.0	750

**Steel core cutter**

- For exact damage preparation on radial and diagonal tyres
- Specially for the preparation and precision removal of the damaged area
- For the use with pneumatic drill
- Long life time
- Special tool steel

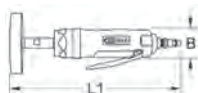


	Ø mm	L mm	Weight
331.0680	3,0	57,0	10
331.0681	5,0	58,0	10
331.0682	6,0	72,0	20
331.0683	9,0	100,0	40



**Pneumatic erasing machine**

- Straight design
- Air exhaust through the handle rear end
- For one handed operation with ergonomic design
- Ideal for removing of stickers glue and color remainders
- Includes neutral colored rubber eraser disc
- Stepless speed regulation
- Number of revolutions adjustable through regulating screw
- Vibration dampened
- Cold insulated handle
- Includes 1/4" coupling connector
- Ultra light robust housing from special plastic



**Technical data:**

Tool holder: 5/16" - 24  
 Capacity: 330 Watt  
 No load current: 2600 r.p.m.  
 Vibration acceleration: < 0,70 m/s<sup>2</sup>  
 Noise performance level: 95 dbA  
 Noise pressure level: 82 dbA  
 Air consumption: 85 l/min  
 Operating pressure: max. 6,3 bar (90 psi)  
 Min. tube diameter: 3/8" - 10 mm  
 Connection thread: 1/4"PT

	B mm	L mm	Eraser wheels	Weight
515.1244	40.0	225.0	515.1243	1.08

**Rubber eraser disc**

- For removing of stickers, glue and color remainders on varnished areas
- Includes neutral colored rubber eraser preventing a smearing on the surface
- Not suitable for pneumatic die grinders



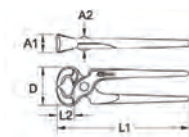
**Technical data:**

Speed: 4000 rpm  
 Shaft: M8

	B mm	D mm	Content	Weight
515.1243	15,0	90,0	1	110
515.1285	15,0	90,0	6	660

**Rabitz pliers**

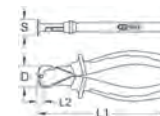
- In accordance to DIN / ISO 9242
- With PVC dipped handle
- Ground heads
- For cutting and twisting tie wire
- Oil-hardened
- Black surface
- Special tool steel



	A1 mm	A2 mm	D mm	L1 mm	L2 mm	Weight
116.1404	18,0	19,0	26,0	190,0	17,0	350
116.1401	20,0	19,0	29,0	220,0	17,0	400
116.1400	25,0	20,0	36,0	250,0	17,0	400
116.1403	26,0	20,0	37,0	280,0	17,0	500

**ERGOTORQUE® c utting pliers**

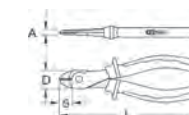
- In accordance to DIN ISO 5748
- Suitable for various types of wire
- Induction-hardened precision cutting
- With two component handle
- Matt chrome
- Special tool steel



	D mm	L1 mm	L2 mm	S mm	Weight
115.1015	31,0	160,0	7,0	24,0	270

**ERGOTORQUE® hi gh leverage side cutter**

- In accordance to DIN ISO 5749
- 30° angled head
- Long cutting edge
- Suitable for various types of wire
- Induction-hardened precision cutting
- With two component handle
- Matt chrome
- Special tool steel



	A mm	D mm	L mm	S mm	Weight
115.1013	12,0	29,0	180,0	21,0	260

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## WEDGES

### Underlaid sheet metal wedge (pair)

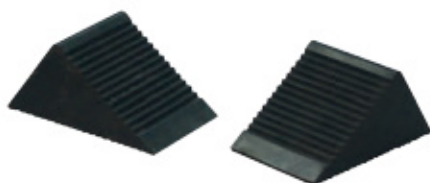
- For securing large vehicles and for load securing
- Optimal slip resistance
- Perforated support surface
- No deformation
- Delivery takes place in pairs
- Heavy version
- Made of sturdy sheet



	Length mm	Height mm	Width mm	
160.0381	230.0	220.0	125.0	700

### Underlaid rubber wedge (pair)

- For securing trailers, vehicles and for load securing
- Optimal slip resistance
- Gridded support surface
- No deformation, no rusting
- More durable than plastic or sheet metal wedge
- Delivery takes place in pairs
- Made of solid rubber



	Length mm	Height mm	Width mm	
160.0382	105.0	75.0	75.0	660

### Underlaid rubber wedge with handle

- For securing trailers, vehicles and for load securing
- Optimal slip resistance
- Incorporated handle for easy transport
- Gridded support surface
- No deformation, no rusting
- More durable than plastic or sheet metal wedge
- Delivery takes place in parts
- Heavy version
- Made of solid rubber



	Length mm	Height mm	Width mm	
160.0383	200.0	150.0	100.0	2.20

## LIFT TECHNOLOGY

### Hydraulic vehicle mover

- Universally applicable on driver and passenger side
- Casters allow for the manoeuvring of vehicles in the tightest spaces
- Ideal for manoeuvring vehicles on solid ground
- Easily rolled in any direction
- For the space-saving storage of vehicles in repair breaks
- Ideal for showrooms, body shops, towing companies, etc.
- Easy operation via foot pedal
- With self-lubricating ball bearings
- Four ball bearing solid rubber casters
- With plastic rollers



#### Technical data:

Tyre size: 13" - 19"  
Wheel diameter: 720 mm

	Max load 1 pos / kg	Max load 4 pos / kg	Clear tyre width mm	
160.0412	680	2720	228	16.60

### Hydraulic vehicle mover

- Universally applicable on driver and passenger side
- Casters allow for the manoeuvring of vehicles in the tightest spaces
- Ideal for manoeuvring vehicles on solid ground
- Easily rolled in any direction
- For the space-saving storage of vehicles in repair breaks
- Ideal for showrooms, body shops, towing companies, etc.
- Easy operation via foot pedal
- With self-lubricating ball bearings
- Four ball bearing solid rubber casters
- With plastic rollers



#### Technical data:

Tyre size: 13" - 19"  
Wheel diameter: 720 mm

	Max load 1 pos / kg	Max load 4 pos / kg	Clear tyre width mm	
160.0413	680	2720	305	16.60



### Hydraulic vehicle mover

- Universally applicable on driver and passenger side
- Casters allow for the manoeuvring of vehicles in the tightest spaces
- Ideal for manoeuvring vehicles on solid ground
- Easily rolled in any direction
- For the space-saving storage of vehicles in repair breaks
- Ideal for showrooms, body shops, towing companies, etc.
- Easy operation via foot pedal
- With self-lubricating ball bearings
- Four ball bearing solid rubber casters
- With aluminum rollers



#### Technical data:

Tyre size: 13" - 19"  
Wheel diameter: 720 mm

	Max load 1 pos / kg	Max load 4 pos / kg	Clear tyre width mm	
160.0414	680	2720	305	18.44

### Storage and Trolley for vehicle mover

- Universally applicable
- Casters allow for manoeuvring
- Easily rolled in any direction
- For the space-saving housing of hydraulic vehicle movers
- Suitable for 4 vehicle movers
- With self-lubricating ball bearings
- Four ball bearing solid rubber casters



	Length mm	Width mm	Height mm	
160.0415	800.0	470.0	230.0	9.64



**Wheel roller set**

- Direct rolls enable the movement in the narrowest of areas
- Ideally for the maneuvering of vehicles on firm round
- For the space saving storing of vehicles in repair workshops
- Four ball bearing solid rubber wheels



**Technical data:**

Max. tyre size: 13" - 16"  
 Wheel diameter: 90.0 mm

	Max load 1-punk-kg	Max load 4-punk-kg	Min tyre width mm	
160.0375	450,0	1800,0	360,0	10,00

**Aluminium axle stand set**

- Especially light and stable
- High level of stability due to the diameter of the base plate
- Safety locking bolt with chain
- Suits itself especially well in combination with jack for the safe bracing of a load
- Aluminium



	Max load t	Stroke way mm	Min total height mm	Max total height mm	
160.0315	3,0	140,0	260,0	400,0	2,20

**Steel chassis stand with quick lock**

- Solidly built
- For heavy vehicle weights
- High level of stability due to large sturdy base plate
- Support bar made of cast steel
- Quickly adjustable
- 13-stage quick clamping lever
- Particularly suitable in combination with car jacks for the safe bracing of a load
- Delivery takes place in parts
- Made of solid steel
- 160.0377 / 160.0378 with turnstile



	Max load t	Min total height mm	Max total height mm	
160.0373	10	450,0	750,0	21,50
160.0374	10	650,0	1100,0	26,50
160.0377	20	420,0	660,0	29,00
160.0378	20	665,0	1170,0	29,00
160.0379	25	415,0	640,0	25,50
160.0380	25	675,0	1050,0	35,50

**Steel axle stands with quick adjustment**

- 4 feet on each stand
- Solid construction
- For heavy vehicles weights
- High level of stability
- Lifting bar made from cast steel
- Quick adjustment
- Supplied in pairs
- Height adjustment has 13 stages
- Suits itself especially well in combination with jack for the safe bracing of a load
- Made from solid steel



	Max load t	Stroke way mm	Min total height mm	Max total height mm	
160.0370	3,0	130,0	295,0	425,0	8,00
160.0371	6,0	205,0	400,0	605,0	15,00
160.0372	12,0	250,0	480,0	730,0	26,00

**Spindle support stand**

- Variably adjustable via spindle
- 3-foot chassis stand
- Solidly built
- For heavy vehicle weights
- High level of stability
- Collapsible, so saves a lot of space
- Is particularly suitable in combination with jacks for securing and supporting a load
- Made of solid steel



	Max load t	Min total height mm	Max total height mm	
160.0441	12,0	456,0	710,0	17,00
160.0442	12,0	710,0	1065,0	25,00



**Hydraulic bottle jack 2 - 100 t**

- Security valve against overload
- Telescopic piston pole
- Additional spindle for extension (not in 30 and 50 t executions)
- Two piece lever arms
- For heavy vehicles weights
- Especially suitable for narrow hard to access areas
- High level of stability
- Ideally suited in combination with jack for the neutralizing and bracing of a load
- Heavy steel construction



	Max load t	Min total height mm	Max total height mm	Hydraulic lift mm	Screen extension mm	Dimension of base plate mm	
160.0350	2,0	181,0	345,0	116,0	48,0	88 x 92	2,90
160.0351	3,0	194,0	372,0	118,0	60,0	92 x 100	3,80
160.0352	5,0	216,0	413,0	127,0	70,0	96 x 112	5,10
160.0354	10,0	230,0	460,0	150,0	80,0	110 x 127	7,10
160.0356	15,0	230,0	460,0	150,0	80,0	113 x 136	9,30
160.0358	20,0	242,0	452,0	150,0	60,0	144 x 155	11,90
160.0359	30,0	285,0	465,0	180,0	-	190 x 155	21,70
160.0360	50,0	300,0	480,0	180,0	-	218 x 176	30,70
160.0349	100,0	335,0	515,0	180,0	-	240 x 260	35,50

**Hydraulic aluminium trolley jack**

- Especially light aluminium jack
- Shallow depth for comfortable working under the vehicle
- Large base for safe standing
- Controlled releasing through the turning of the pump lever
- Raising with small pump lifts to the maximum height
- Good maneuverability through two oil and acid resistant nylon direct castors
- Intergrated screw tray
- The lower area of the pump lever is coated with foam material
- Lifting plate diameter 120 mm
- Problem free movement due to lightweight and secure handling
- Ideally suited for the use in service vehicles and workshop use
- Extremely heavy aluminium construction



	Max capacity t	Stroke way mm	Min total height mm	Max total height mm	Total length mm	Spindle lifting plate	
160.0365	2,0	385,0	85,0	470,0	630,0	160.0361	20,00
160.0369	3,0	405,0	100,0	510,0	690,0	160.0361	26,00

**Hydraulic steel trolley jack 3 t**

- Large base for safe standing
- Controlled releasing through the turning of the pump lever
- Raising with small pump lifts to the maximum height
- Good maneuverability through two oil and acid resistant nylon direct castors
- Integrated screw tray
- The lower area of the pump lever is coated with foam material
- Lifting plate diameter 140 mm
- Overload protection through pressure relief valve
- Ideally suited for daily workshop use
- Heavy steel construction



Max capacity t	Stroke exp. mm	Min total height mm	Max total height mm	Total length mm	Open lifting plate	kg	
160.0366	3,0	410,0	125,0	535,0	720,0	160.0362	43,00



**Hydraulic steel trolley jack**

- Very shallow depth for comfortable working under the vehicle
- Large base for safe standing
- Raising with the pump lever and foot lever is possible
- Foot pedal for the bridging of the empty stroke
- Controlled releasing through the turning of the pump lever
- Raising with small pump lifts to the maximum height
- Good maneuverability through two oil and acid resistant nylon direct castors
- Integrated screw tray
- The lower area of the pump lever is coated with foam material
- Lifting plate diameter 120 mm
- Overload protection through pressure relief valve
- Ideally suited for daily workshop use
- Heavy steel construction



Max capacity t	Stroke exp. mm	Min total height mm	Max total height mm	Total length mm	Open lifting plate	kg	
160.0367	2,0	420,0	70,0	490,0	700,0	160.0363	43,00
160.0368	3,0	440,0	90,0	530,0	800,0	160.0363	54,00

**Hydraulic steel trolley jack**

- Slightly lower load depth for modern automobile car bodies
- Large base for safe standing
- Automatic ventilation of the hydraulic systems
- Overload protection through overload pressure valve
- Raising with the hand and foot lever is possible
- Foot pedal for the bridging of the empty stroke
- The lower area of the pump lever is coated with foam material
- Controlled releasing through the turning of the pump lever
- Lifting plate diameter 140 - 170 mm
- Good maneuverability through oil and acid resistant nylon direct castors
- Ideally suited for daily workshop use
- Durable steel construction



Max capacity t	Stroke exp. mm	Min total height mm	Max total height mm	Total length mm	Open lifting plate	kg	
160.0702	5,0	400,0	160,0	560,0	1481,0	160.0702-007	125,00
160.0703	10,0	400,0	170,0	570,0	1560,0	160.0703-007	170,00

**TYRE TRANSPORT**

**Tyres platform trolley**

- Solid construction of steel sheet
- Firmly fixed grasping handle made from steel tube
- Grasping handle is hinged and locked with safety security catches without any tools
- In minimal time
- Rubber surrounding edges protect the trolley and surroundings from damage
- For ball bearing rubber wheels
- Load area has a plastic covering



**Technical data:**  
 Wheel diameter: 100 mm  
 Total load capacity: 150 kg

	L mm	B mm	H mm	kg
800.0015	740,0	480,0	810,0	9,20

**Professional wheel trolley**

- Steel tubular structure with deep welded joints
- Light and agile transportation for use in smallest space
- For the easy stacking and transporting of tyres and wheels
- From round tubes welded together manufactured and solid
- 2 large pneumatic tyres
- 2 fixed rubber wheels
- Improved standing and prevention of tipping
- Optimal transportation due to traverse brake stop
- Perfectly suitable with the tyre trade or vehicle workshops



**Technical data:**

Large size fixed wheels: Ø 260 mm (pneumatic tyres)  
 Large size swivel wheels: Ø 125 mm (solid rubber)  
 Max. bucket dimensions: Ø 730 mm

	Max load kg	L mm	B mm	H mm	kg
160.0055	150,0	850,0	715,0	1610,0	15,00

**You can find our wide range of impact wrenches and battery-powered impact wrenches in our hand tool catalogue on page 382 and 396.**



# THE PREMIUM RANGE

## THE ALUMINIUM RIM FORCE SOCKETS

... WITH THE PROTECTIVE RING FOR INCREASED SERVICE LIFE!



Today, we are making tomorrow perfect; yesterday we created our starting point for today.



**SLIMPOWER Aluminium rim force sockets...**

With the protective ring for increased service life!

The world's first range featuring the protective ring with extra-long service life and extreme durability. The wait for progress is over!



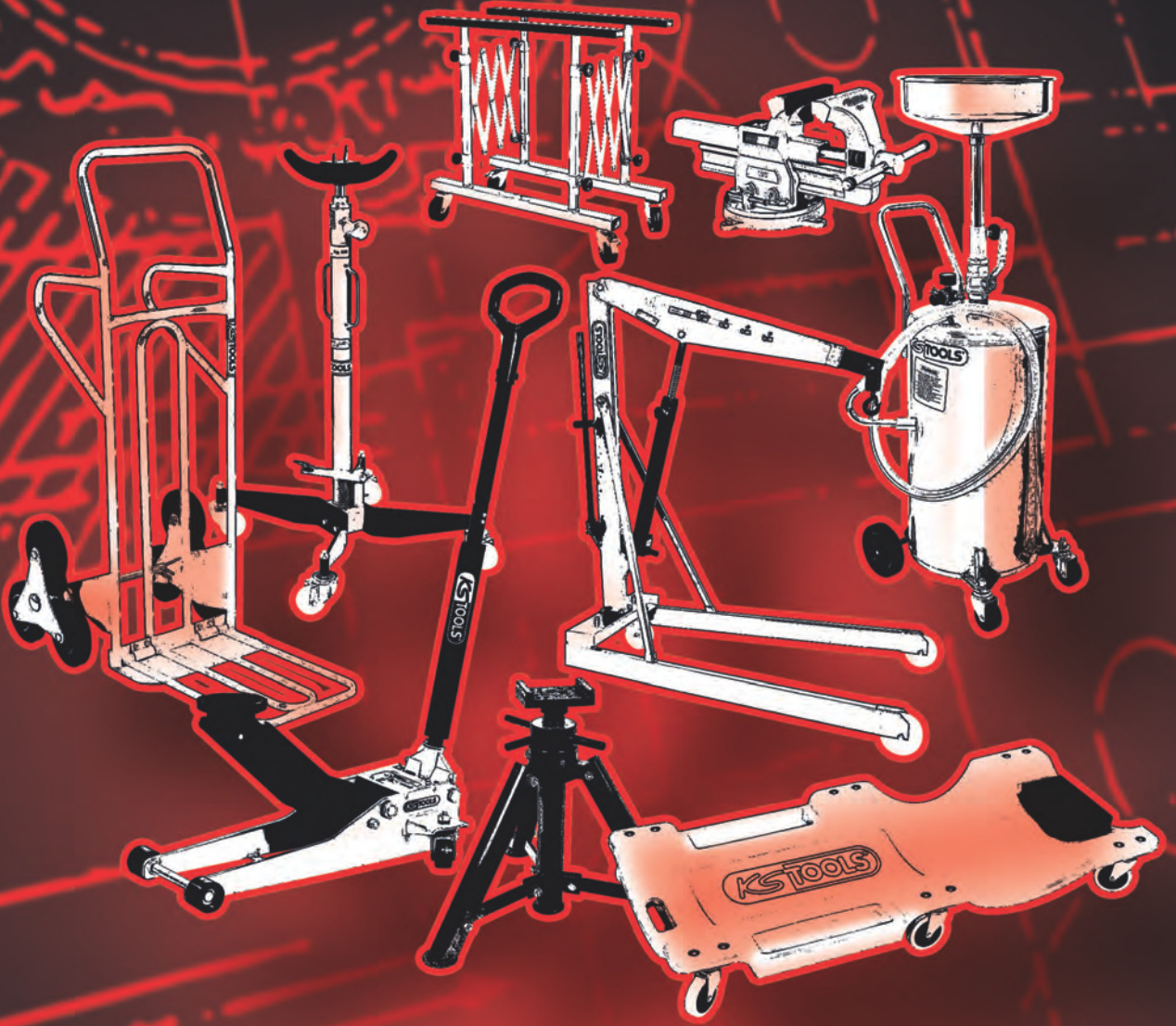
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*Innovation is our mission!*



GENERAL WORKSHOP REQUIREMENTS



Innovation is  
our mission!





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**VICES**

**Pipe vice**

- Hinged
- V-shaped support
- Special steel
- Ideal for working with hydraulics and pneumatic lines



	Clamping range mm	Clamping range	Weight
914.0010	10,0 - 60,0	1/8" - 2"	6.88
914.0011	10,0 - 89,0	1/8" - 3"	6.88

**Chain pipe vice**

- Hinged
- V shaped pipe rest with teeth
- Interchangeable jaws
- Special steel



	Clamping range mm	Clamping range	Weight
914.0012	10,0 - 76,0	1/8" - 2.1/2"	1.90
914.0014	10,0 - 114,0	1/8" - 4"	4.50
914.0016	10,0 - 165,0	1/8" - 6"	8.50

**Bench vice**

- Swivel base
- Interchangeable jaws
- Includes pipe vice attachment
- Absolutely parallel with adjustable centric drive
- Extra high possible clamping jaws shaped by large embossed casting
- Large anvil for straightening and compression work
- Induction hardened jaws and anvil
- Vise forward opening
- Ground jaws, anvil plate and slide corners
- Special steel



	Jaw length	Jaw length mm	Clamping range mm	Weight
914.0003	3"	75,0	100,0	7.50
914.0004	4"	100,0	120,0	8.70
914.0005	5"	130,0	140,0	11.00
914.0006	6"	150,0	170,0	14.50
914.0008	8"	200,0	200,0	20.50

**Bench vice**

- With adjusting screw and pipe clamps
- Forged front and rear jaws
- Extra high possible clamping jaws shaped by large embossed casting
- Durable prismatic guide
- With mounting screws for turntable
- Induction hardened jaws and anvil
- Double start trapezoidal thread for quick opening and closing
- Vise forward opening
- Ground jaws, anvil plate and slide corners
- Special steel



	Jaw length mm	Clamping range mm	T mm	H mm	L mm	Clamping force	Weight
914.0026	100,0	125,0	70,0	140,0	320,0	12,0	5,00
914.0031	125,0	155,0	80,0	180,0	395,0	14,0	11,00
914.0036	150,0	180,0	98,0	220,0	485,0	16,0	20,00
914.0041	175,0	205,0	110,0	240,0	550,0	18,0	29,00

**Turntable for bench vice**

- Ideal supplement for KS-vices 914.0027 - 914.0041
- Enables accurate positioning of the workpiece
- 360° freely rotatable
- Safe and quick locking via handle
- Flat and stable construction
- Inclusive fastening screws for vice



		Ø mm	Weight
914.0027	914.0026	100,0	1,40
914.0032	914.0031	125,0	2,80
914.0037	914.0036	150,0	3,75
914.0042	914.0041	175,0	4,85

**Bench vice with turntable**

- With adjusting screw and pipe clamps
- Forged front and rear jaws
- Extra high possible clamping jaws shaped by large embossed casting
- Durable prismatic guide
- With mounting screws for turntable
- Induction hardened jaws and anvil
- Double start trapezoidal thread for quick opening and closing
- Vise forward opening
- Ground jaws, anvil plate and slide corners
- Special steel



	Jaw length mm	Weight	
914.0025	2 pcs	100,0	6,40
914.0030	2 pcs	125,0	13,80
914.0035	2 pcs	150,0	23,75
914.0040	2 pcs	175,0	33,85

**Aluminium bench vice protective jaws with textured surface**

- Suitable for all bench vices
- The profile is right angled and level parallel
- Integrated special magnet hold the protective jaws safely on the vice
- For material protection and non slip grip on sensitive materials
- For coarse to medium fine work pieces
- Fine textured
- Aluminium



	Protective jaws mm	Weight
914.0080	100,0	170
914.0081	120,0	210
914.0082	140,0	240
914.0083	160,0	260
914.0084	175,0	290

**Aluminium bench vice protective jaws with trapezoid notches**

- Suitable for all bench vices
- The profile is right angled and level parallel
- Integrated special magnet hold the protective jaws safely on the vice
- For material protection and non slip grip on sensitive materials
- For different shaped materials
- For trapezoid use
- Aluminium



	Protective jaws mm	Weight
914.0085	100,0	145
914.0086	120,0	187
914.0087	140,0	210
914.0088	160,0	226
914.0089	175,0	248

**Aluminium bench vice protective jaws with rubber insert**

- Suitable for all bench vices
- The profile is right angled and level parallel
- Integrated special magnet hold the protective jaws safely on the vice
- For material protection and non slip grip on sensitive materials
- For thin walled wood and plastic parts
- Smooth
- Aluminium / rubber

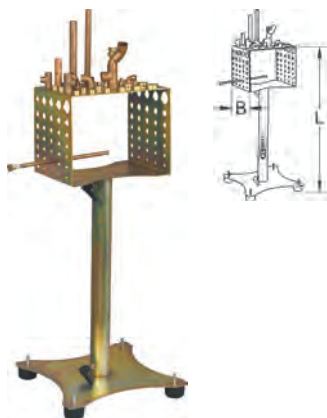


	Protective jaws mm	Weight
914.0090	100,0	163
914.0091	120,0	207
914.0092	140,0	224
914.0093	140,0	204
914.0094	175,0	276



**Soldering vice**

- Special steel



	B mm	L mm	kg
914.0020	255,0	990,0	13,20

**SERVICE TROLLEYS**

**Workshop service trolley**

- Made from robust sheet steel construction
- Non slip foam insert on the upper working surface
- Lower shelf with high retaining border
- 2 castor wheels 100 mm
- 2 castor wheels with brake 100 mm
- High level of stability



**Technical data:**  
Total load capacity: 200 kg

	L mm	B mm	H mm	kg
890.0002	697,0	489,0	836,0	19,10

**Workshop service trolley**

- Extremely substantial plastic construction
- Without screws easily constructed
- Distance between the ground 30 cm
- 2 castor wheels 100 mm
- 2 castor wheels with brake 100 mm
- High level of stability
- Light profile eight
- Columns made out of anodised aluminum



**Technical data:**  
Total load capacity: 200 kg

	L mm	B mm	H mm	kg
800.0020	860,0	480,0	1010,0	12,10

**Workshop service trolley with lining**

- Extremely substantial plastic construction
- Equipment lining
- Without screws easily constructed
- Distance between the ground 30 cm
- 2 castor wheels 100 mm
- 2 castor wheels with brake 100 mm
- High level of stability
- Light profile eight
- Columns made out of anodised aluminum



**Technical data:**  
Total load capacity: 200 kg

	L mm	B mm	H mm	kg
800.0021	860,0	480,0	1010,0	12,10

**Workshop service trolley with 2 drawers**

- Extremely robust plastic construction
- Easily constructed without screws
- Two ball bearing drawer runner guides
- 2 castor wheels 100 mm
- 2 castor wheels with brake 100 mm
- High level of stability
- Light profile eight
- Columns made out of anodised aluminum



**Technical data:**  
Drawer dimensions: H 85 x B 430 x T 520 mm  
Total load capacity: 200 kg  
Load capacity of each drawer: 35 kg

	L mm	B mm	H mm	kg
800.0030	860,0	480,0	1010,0	14,20

**Workshop service trolley with 2 drawers and lining**

- Extremely substantial plastic construction
- Without screws easily constructed
- Two ball bearing drawer runner guides
- 2 castor wheels 100 mm
- 2 castor wheels with brake 100 mm
- High level of stability
- Light profile eight
- Columns made out of anodised aluminum



**Technical data:**  
Drawer dimensions: H 85 x B 430 x T 520 mm  
Total load capacity: 200 kg  
Load capacity of each drawer: 35 kg

	L mm	B mm	H mm	kg
800.0031	860,0	480,0	1010,0	15,00

**PLATFORM TROLLEY**

**Tyres platform trolley**

- Solid construction of steel sheet
- Firmly fixed grasping handle made from steel tube
- Grasping handle is hinged and locked with safety security catches without any tools
- In minimal time
- Rubber surrounding edges protect the trolley and surroundings from damage
- With 4 ball bearing rubber wheels, 2 with steering
- Load area has a plastic covering



**Technical data:**  
Wheel diameter: 100 mm  
Total load capacity: 150 kg

	L mm	B mm	H mm	kg
800.0015	740,0	480,0	810,0	9,20

**PLATFORM**

**Aluminium work platform**

- With skid-proof profile on the running stage
- With chequer plate profile on the steps
- No tipping over through obliquely placed standing feet
- Double-sided access
- With large platform for safe standing
- With safety clips for added security
- Beams and steps made from aluminium
- Collapsible and therefore space saving when storing
- Rounded plastic feet protect the floor and the running stage
- Secure stand makes working easier
- Can be used to assemble screens, engine bay work, work on the roof, commercial vehicle pit work, etc.
- Universally usable for high vehicles such as camper vans, small transporters, wagons, buses and off-road vehicles
- Heavy aluminium construction



**Technical data:**

Platform dimensions: 1000 x 300 mm  
 Total load capacity: 150 kg

	L mm	B mm	H mm	kg
800.0960	1345.0	405.0	480.0	7.40

**Safety assembly step**

- No tipping over through obliquely placed standing feet
- Anti slip, hot dip galvanised, with the frame riveted lattice rustproof
- Step to DIN 50976
- Massive and distortion stiff steel tube construction
- Base frame plastic coated
- The gripped plastic feet protect the surface and add stability
- Applicable e.g. panel assembly, engine compartment works, roof works truck pit working
- Universal suitable in very high vehicles e.g. motor homes, small vehicles, truck and buses, terrain vehicles



**Technical data:**

Height 2nd step: 450.0 mm  
 Surface area: 690 x 620 mm  
 Steel grating: 590 x 290 mm  
 Total load capacity: 300 kg

	L mm	B mm	H mm	kg
450.0960	Safety assembly step			14.00

**SUPPORTS**

**Windscreen table with rubber protective pads**

- Ideally suited to holding the windscreen when removing, or removing adhesive material
- Four moveable rubber nipples hold the windscreen in place and prevent scratches
- Fully adjustable in width
- For nearly all windscreen sizes
- Foldable to save space during storage
- Robust construction
- Up to 80 kg capacity
- From zinc coated steel pipe



	L mm	H mm	Surface pad Ø mm	kg
140.2225	1030.0	1040.0	125.0	8.40

**Windscreen holder**

- Ideally suited to holding the windscreen when removing, or removing adhesive material
- Holding tube with non-slip, coated padding offer optimal grip and prevent scratches
- Fully adjustable in width
- For nearly all windscreen sizes
- Foldable to save space during storage
- Robust construction
- Up to 80 kg capacity
- From zinc coated steel pipe



	L mm	H mm	kg
140.2226	1030.0	940.0	6.60

**Universal Telescopic-Multi-purpose trolley**

- Ideally suited to bodywork restoration, in the painting area or for filling screens when removing, or applying adhesive material, etc.
- Holding tube with non-slip, coated padding offer optimal grip and prevent scratches
- The multi-talented universal use, since width and height are fully adjustable and lockable
- For nearly all windscreen sizes
- Can also be used as a work bench or for carrying parts
- Collapsible to save space during storage
- With 4 stable castors, 2 with locking brakes
- Simple handling
- Load capacity up to 100 kg
- Robust construction from square pipe



	B mm	H mm	kg
500.8100	257.0-1380.0	845.0-1320.0	23.50

**Windscreen worktable with castors**

- Ideally suited to holding the windscreen when removing, or removing adhesive material
- Holding tube with non-slip, coated padding offer optimal grip and prevent scratches
- For nearly all windscreen sizes
- Foldable to save space during storage
- With 4 stable castors, 2 with locking brakes
- Simple handling
- Load capacity up to 100 kg
- Robust construction from steel pipe



	L mm	H mm	hd	kg
140.2227	900.0	930.0	140.2228	8.00



**PAINT REQUIREMENTS**

**Single-use colour filter sieve**

- Ideal for filtering paints of mechanical impurities
- Paper filter with nylon filter insert
- Optimal for fine cleaning



	Micro	Content	Colour code	Weight
500.8062	125	250	○	1.50
500.8061	190	250	○	1.50

**Single-use colour mixer with cover**

- Single-use colour mixer for mixing all types of paint
- Solvent resistant plastic
- Cover for optimal storage
- With mix scale
- Also suitable for water-based paints



	Material	Colour code	Content	Capacity	Weight
500.8056	polypropylene	transparent	400	25	420
500.8057	polypropylene	transparent	650	25	620
500.8058	polypropylene	transparent	1300	25	1100
500.8059	polypropylene	transparent	2240	25	1700

**Single-use protective overall**

- Universal usage, e.g. during painting
- Breathable
- Hood with elastic band
- Arm, leg and waist bands
- Zip fastener with cover



	Colour code	Content	Weight
500.8006	S	white	1 220
500.8007	M	white	1 220
500.8008	L	white	1 220
500.8009	XL	white	1 220
500.8076	XXL	white	1 220

**PAINTING STANDS**

**Paint stand for wheel rims**

- Ideally suited to filling rims or wheels when grinding or painting
- Adjustable holding devices offer optimum grip and protect from scratches
- Multi-way adjustment: width, height and tilt
- For almost all sizes
- With four sturdy rollers, two of which have brakes
- Efficient, one-handed working
- Support rods and cone can be adjusted optimally
- Rims and wheels can be turned for optimum results
- No stopping work leading to a smoother finish
- Saves a lot of time when preparing for painting
- Better results
- Up to 90 kg capacity
- Robust construction from steel pipe



	L mm	B mm	H mm	Weight
140.2222	950,0	900	1350,0-1950,0	19,00

**Painting stands**

- Ideally suited to filling bonnets, tail gates, wings, bumpers and when grinding or painting
- Adjustable holding devices offer optimum grip and protect from scratches
- Multi-way adjustment: width, height and tilt
- For almost all sizes
- With 4 sturdy castors, 2 of which have brakes and steering
- Efficient, one-handed working
- No stopping work leading to a smoother finish
- Saves a lot of time when preparing for painting
- Better results
- Up to 35 kg capacity
- Robust construction from steel pipe



	L mm	B mm	H mm	Weight
140.2254	1100,0	780,0	1500,0	17,50

**Rotatable paint stands**

- Ideally suited to filling bonnets, tail gates, wings, bumpers and small parts when grinding or painting
- Adjustable holding devices offer optimum grip and protect from scratches
- Multi-way adjustment: width, height and tilt
- Can be turned 360° with foot lever
- For almost all sizes
- Includes lengthener which can be disassembled at any time
- With 6 universally adjustable holding arms
- Includes gun holder on one side
- With two sturdy wheels
- Efficient, one-handed working
- No stopping work leading to a smoother finish
- Saves a lot of time when preparing for painting
- Better results
- Up to 35 kg capacity
- Robust, galvanised construction



	L mm	B mm	H mm	Weight
140.2384	1900,0	800,0	1000,0	17,00

**Paper trolley with 2 shelves**

- Ideally suited to masking painting
- Mobile paper dispenser with 2 shelves for up to 2 paper rolls
- Suitable for covering paper and covering sheets up to 45 cm
- Supplied with adjustable tape pressure rollers
- Includes gun holder on one side
- Problem-free and graded separation with use of a sharp blade
- With practical storage compartments
- With two sturdy wheels
- Includes handle for easy movement in the workshop
- Robust construction from steel pipe



	L mm	B mm	H mm	Weight
140.2382	660,0	600,0	920,0	11,00

### Paper trolley with 4 shelves

- Ideally suited to masking painting
- Mobile paper giver with 4 shelves for up to 4 paper rolls
- Suitable for covering paper and covering sheets up to 45 cm
- Two shelves for max. 30 cm and two shelves for max. 45 cm
- Supplied with adjustable tape pressure rollers
- Problem-free and graded separation with use of a sharp blade
- With two sturdy wheels
- Includes handle for easy movement in the workshop
- Robust construction from steel pipe



	L mm	B mm	H mm	kg
140.2383	580,0	560,0	1080,0	11,00

### Paper trolley with 3 shelves

- Ideally suited to masking painting
- Mobile paper giver with 4 shelves for up to 6 paper rolls
- Suitable for covering paper and covering sheets up to 90 cm
- Supplied with adjustable tape pressure rollers
- Simple replacing of paper rolls
- Multi-adjustable for different lengths
- Includes gun holder on both sides
- With 4 sturdy, steerable castors
- Includes handle for easy movement in the workshop
- Robust construction from steel pipe



	L mm	B mm	H mm	kg
140.2350	1240,0	540	1130,0	29,00

### PALLET CAGE TROLLEY

#### Pallet cage trolley

- For universal use in the workshop
- Ideal for transporting body parts, screens, etc.
- With 4 steering castors
- Load capacity up to 80 kg
- Robust construction from steel pipe



	Length mm	Width mm	Height mm	kg
160.0260	900,0	600,0	1965,0	40,86

### TRANSPORT TROLLEY

#### Telescopic sack trolley with pneumatic wheels

- Steel tubular structure with deep welded joints
- Light and agile transportation for use in smallest space
- Effortless receiving and transporting of packages, carton and all other objects
- From round tubes welded together manufactured and solid
- Fold away shovel base
- High quality telescopic pole
- Equipped with 2 fixed wheels with pneumatic tyres
- Safety handles and slip protection
- Perfectly suitable in industry and business



**Technical data:**

Tyre size: Ø 260 x 80 mm

Shovel/base dimensions: B 300 x T 350 mm

Min. dimensions: 810,0 mm

Max. dimensions: 1140,0 mm

	Max load kg	L mm	B mm	H mm	kg
160.0224	120,0 kg	630,0	480,0	1140,0	10,00

### Transport sack trolley with pneumatic wheels

- Steel tubular structure with deep welded joints
- Light and agile transportation for use in smallest space
- Effortless receiving and transporting of packages, carton and all other objects
- From round tubes welded together manufactured and solid
- Very wide shovel base
- Equipped with 2 fixed wheels with pneumatic tyres
- Safety handles and slip protection
- Perfectly suitable in industry and business



**Technical data:**

Tyre size: Ø 260 x 85 mm

Shovel/base dimensions: B 400 x T 170 mm

	Max load kg	L mm	B mm	H mm	kg
160.0225	250,0 kg	430,0	550,0	1100,0	10,00

### Transport sack trolley with full rubber tyres

- Steel tubular structure with deep welded joints
- Light and agile transportation for use in smallest space
- Effortless receiving and transporting of packages, carton and all other objects
- From round tubes welded together manufactured and solid
- Equipped with 2 fixed full rubber wheels
- Safety handles and slip protection
- Perfectly suitable in industry and business



**Technical data:**

Tyre size: Ø 255 x 46 mm

Shovel/base dimensions: B 400 x T 170 mm

	Max load kg	L mm	B mm	H mm	kg
160.0228	250,0 kg	430,0	560,0	1100,0	17,00



**Transport sack trolley with pneumatic wheels**

- Steel tubular structure with deep welded joints
- Light and agile transportation for use in smallest space
- Effortless receiving and transporting of packages, carton and all other objects
- From round tubes welded together manufactured and solid
- Fold away shovel base
- Equipped with 2 fixed wheels with pneumatic tyres
- Safety handles and slip protection
- Perfectly suitable in industry and business



**Technical data:**

Tyre size: Ø 260 x 85 mm  
 Shovel/base dimensions: W 400 x D 170 mm  
 Platform: W 330 x D 520 mm

Max load kg	L mm	B mm	H mm	kg	
160.0226	250.0	775.0	550.0	1100.0	10.00

**Sack trolley with full rubber three staged wheels**

- Steel tubular structure with deep welded joints
- Light and agile transportation for use in smallest space
- Effortless receiving and transporting of packages, cartons and all other objects
- From round tubes welded together manufactured and solid
- Fold away shovel base
- Problem free overcoming of stairs
- Full rubber three staged wheels
- Perfectly suitable in industry and business



**Technical data:**

Tyre size: Ø 160 x 30 mm  
 Shovel/base dimensions: W 400 x D 170 mm  
 Platform: W 330 x D 520 mm

Max load kg	L mm	B mm	H mm	kg	
160.0227	250.0	850.0	610.0	1285.0	15.00

**Professional wheel trolley**

- Steel tubular structure with deep welded joints
- Light and agile transportation for use in smallest space
- For the easy stacking and transporting of tyres and wheels
- From round tubes welded together manufactured and solid
- 2 large pneumatic tyres
- 2 fixed rubber wheels
- Improved standing and prevention of tipping
- Optimal transportation due to traverse brake stop
- Perfectly suitable with the tyre trade or vehicle workshops



**Technical data:**

Large size fixed wheels: Ø 260 mm (pneumatic tyres)  
 Large size swivel wheels: Ø 125 mm (solid rubber)  
 Max. bucket dimensions: Ø 730 mm

Max load kg	L mm	B mm	H mm	kg	
160.0095	150.0	850.0	715.0	1610.0	15.00

**Transport trolley for barrels**

- Steel tubular structure with deep-welded joints
- With pneumatic tyres
- Light and agile transportation for use in smallest space
- Suitable for all common 200 litre barrels (GGVS, UNO)
- With barrel rim holder for secure grip
- Thanks to adjustable height other barrel sizes may be transported safely



**Technical data:**

Tyre size: Ø 260 x 85 mm

Max load kg	B mm	H mm	kg	
160.0223	250.0	700.0	1600.0	13.40

**Transport trolley with full rubber tyres**

- Steel tubular structure with deep welded joints
- Light and agile transportation for use in smallest space
- Effortless receiving and transporting of packages, carton and all other objects
- From round tubes welded together manufactured and solid
- Fold away shovel base
- Equipped with 2 fixed full rubber wheels
- Safety handles and slip protection
- Perfectly suitable in industry and business



**Technical data:**

Tyre size: Ø 255 x 46 mm  
 Shovel/base dimensions: W 400 x D 170 mm  
 Platform: W 330 x D 520 mm

Max load kg	L mm	B mm	H mm	kg	
160.0229	250.0	775.0	560.0	1100.0	19.00

**Bottle trolley**

- Steel tubular structure with deep-welded joints
- Ideal for the storage of 10 litre nitrogen bottles
- With safety chain for transport
- Includes hose attachment
- Integrated tray for accessories
- Stable fully-rubber wheels
- Secure and easy to use
- Special steel



Length mm	Width mm	Height mm	kg	
160.0247	275.0	305.0	1170.0	4.46

## KEY CHAIN

### Key chain, blank

- Ideal for identifying car keys
- With blank area for writing
- Easy to write with a marker
- From stable PVC
- With re-closeable band



Colour code	Content		
500.8018	500	420	

### Key chain with loop

- Ideal for identifying car keys
- With lined area for writing
- Easy to write with a marker
- From stable PVC
- With re-closeable band



Colour code	Content		
500.8093	500	1.00	
500.8094	500	1.00	
500.8019	500	1.00	

### Key chain set

- Optimal work shop set for organising customers and vehicles
- With 1 x key chain with loop, 1 x customer collection ticket, 1 x mirror hanger and 1 x sticker for the order book
- Numbered from 1-300
- From stable PVC
- Saves time when looking for vehicles



Colour code	Content		
500.8017	300	1.20	
500.8016	300	1.20	
500.8015	300	1.20	



## DOCUMENT POCKETS

### Workshop order pocket DIN A4 with key pocket

- Made out of transparent film with protection entry cover
- High quality meaning the document stay clean and are in closed storage with all working papers
- Key has a special compartment with hook and loop fastener
- The front made out of clear plastic means the working papers are readable without removal
- The reinforced back can be used simultaneously as a letter document
- Stable execution with hanging cord serves also as a letter document



Colour code	L mm	B mm		
500.8095	340,0	240,0	190	
500.8096	340,0	240,0	190	
500.8097	340,0	240,0	190	
500.8098	340,0	240,0	190	
500.8099	340,0	240,0	190	

## SEAT AND VEHICLE COVERS

### Tape dispenser for steering wheel wrapping foil

- For using the steering wheel wrapping foil
- Simple handling
- Robust PP plastic



Colour code	Length mm		
500.8023	260,0	60	
500.8024	260,0	60	

### Steering wheel wrapping foil, transparent

- Suitable for wrapping the steering wheel
- Suitable for all steering wheel sizes
- Prevents dirt on the steering wheel
- Easy to use



Material strength µm	L mm	Content		
500.8089	150,0	40	12,80	

### Single-use steering wheel cover

- For covering the steering wheel
- Suitable for almost all steering wheel sizes
- With elasticated band
- Prevents dirt on the steering wheel
- Supplied in a practical storage case



Colour code	Content		
500.8087	250	2,50	

### Single-use gear stick cover

- Ideal for protecting the gear stick
- Fits well with the elastic band
- Ideal for test driving and stays in the work shop
- LDPE plastic
- Supplied in a practical storage case



Colour code	Length mm	Width mm	Content		
500.8092	140,0	145,0	500	2,50	

### Single-use hand brake cover

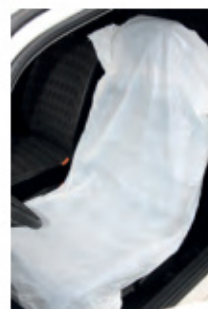
- Ideal for protecting the hand brake
- Fits well with the elastic band
- Ideal for test driving and stays in the work shop
- LDPE plastic
- Supplied in a practical storage case



Colour code	Length mm	Width mm	Content		
500.8071	90,0	160,0	500	2,50	

### Single-use seat cover

- For covering the driver or passenger seat
- For seat sizes 820 x 1300 mm
- Ideal for test driving and stays in the work shop
- Prevents dirt on the original seats
- LDPE plastic
- Supplied on a perforated roll



Colour code	Material strength µm	Content		
500.8081	13	500	5,00	



**Single-use dual-seat cover**

- For covering the rear seats
- For seat sizes 1500 x 1300 mm
- Ideal for test driving and stays in the work shop
- Prevents dirt on the original seats
- LDPE plastic
- Supplied on a perforated roll



Colour code	Material strength µm	Content	kg	
500.8084	white	13	200	6.00

**Single-use, foot mat**

- Suitable for covering the foot well
- Ideal for test driving and stays in the work shop
- Slip-proof
- Prevents the original foot mats from getting dirty
- Material made from 70 g/m<sup>2</sup> paper and 10 g/m<sup>2</sup> PE
- Supplied on a perforated roll



Length cm	Width cm	Content	kg	
500.8086	380.0	500.0	500	5.00

**Tire bags**

- Protects the vehicle interior when transporting tires
- Ideal for storage in the garage or workshop
- LDPE plastic
- Delivery on perforated roll



Length mm	Width cm	Height mm	Colour code	Content	kg	
500.8088	700.0	350.0	900.0	white	100	4.00

**Wheel bolt bag**

- Ideal for the storage of wheel bolts
- With handy drawstring for closing
- Made from 100% cotton



Content	kg	
500.8032	Wheel bolt bag	20

**Interior protector set 5 in 1**

- Optimal interior protection for customer vehicles
- Easy to use and good fit using elasticated drawstring
- 5 pcs set packed in practical polythene bag
- Footwell protector made from strong, coated material
- Seat, steering wheel, gear knob and handbrake lever protectors made from sturdy single-use film



Content	kg	
500.8110	100	10,00

**Plastic garage, transparent**

- Ideal for protecting paint against rain
- Suitable for painting in halls
- With elasticated band
- Easy to use
- LDPE plastic



Colour code	Material strength µm	L m	B m	kg	
500.8073	transparent	300	6.50	3.5	460

**Steering wheel protective cover**

- For covering the steering wheel
- Suitably for almost all steering wheel sizes
- Prevents dirt on the steering wheel
- Made out of machine washable nylon material



Content	kg	
500.8075	Steering wheel protective cover	20

**Gear stick protective cover**

- For covering the gear stick
- Suitably for almost all vehicles
- Prevents dirt on the gear stick
- Made out of machine washable nylon material



Content	kg	
500.8070	Gear stick protective cover	10

**Hand brake protection cover**

- For covering the hand brake
- Suitably for almost all hand brakes
- Prevents dirt on the hand brake
- Made out of machine washable nylon material



Content	kg	
500.8080	Hand brake protection cover	10

1  
2  
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26

### Seat protection cover for single seats

- One piece seat cover
- Made out of machine washable nylon material to cover a front seat
- Suitable for almost all vehicles
- Prevents dirt on the original seat
- Allowed for vehicles with seat airbags
- Therefore also ideal for road tests



		U
500.8065	Seat protection cover for single seats	125

### Double protection cover for front or rear seats

- One piece seat cover
- For covering the front seats, the middle console, the door covers and the foot area
- No glass splinters or dirt on the seats, therefore also ideal for glass repairs
- Suitable for almost all vehicles
- Prevents dirt on the original seat
- Made out of machine washable nylon material



		U
500.8085	Double protection cover for front or rear seats	455

### Seat cover set

- For covering the steering wheel, gear stick and front seats
- Protection against soiling
- Suitable for almost all vehicles
- Allowed for vehicles with seat airbags
- Ideal for road tests
- Made out of machine washable nylon material



		U
500.8025	3 pcs. Seat cover set	1.13

consists of:

		U
500.8065	Seat protection cover for single seats	125
500.8070	Gear stick protective cover	10
500.8075	Steering wheel protective cover	20

### Universal vehicle front end protection cover

- Covers both wings, grill, bumper and lamps therefore protecting during the repair and/or maintenance works
- Universal size therefore suitable for small and medium size vehicles
- Elasticated in the border band
- Wheel cut out for working on the wheels, brakes etc.
- Generous transparent cover for headlamps that enables vehicle lamps testing
- The cut away over the grill permits a trial run whilst the cover is still mounted
- Fleece lamination on one side and easy to clean on the other
- The wing area is reinforced with additional internal protection mat
- Reinforcement over mirror and/or bonnet hinge possible



		U
500.8035	Universal vehicle front end protection cover	1.00

### Universal wing cover with sewn-in magnets

- Outer and under side made from high quality nylon
- Grips on car body sheet metals due to the magnet
- Safe protection against scratches, dirt, oil, etc.
- For protecting the wings during repair and maintenance work



	Length mm	Width mm	U
500.8051	1000.0	640.0	500

### Bodywork protector with sewn-in magnets

- Outer and under side made from high quality nylon
- Grips on car body sheet metals due to the magnet sewn in
- Ideally for the use as the wing protection
- Also as protection against tools for example windscreen replacement



	L mm	B mm	U
500.8050	1070.0	600.0	900

### Bodywork protector with anti slip matting

- Outer side made from high quality nylon
- Under side made from a special anti slip matting
- Grips on car body sheet metals
- Ideally for the use as the wing protection
- Also as protection against tools for example windscreen replacement



	L mm	B mm	U
500.8055	900.0	500.0	0.31
500.8060	1200.0	500.0	2.05

### KNEE AND LIE DOWN MATS

#### Mechanics protection mat

- Helps the mechanic to work easier and safer whilst working in the lower area of vehicles on uneven surfaces
- Moisture and dirt resistant
- Work garments and knees stay dry, clean and protected
- 3 layered padded construction from soft material
- Integrated hand grip
- Petrol and oil resistant
- Universal use in workshops, service and breakdown service vehicles



	L mm	B mm	H mm	U
500.8040	480.0	320.0	36.0	200
500.8045	1220.0	550.0	36.0	750



**Mechanic mat with handle**

- Guarantees safety-conscious working when working under vehicles
- On a flat surface
- Moisture and dirt resistant
- Work clothes and knees remain dry, clean and don't cool down
- Insulated
- Can be folded together
- With integrated carry handle
- Petrol and oil resistant
- Universal use in workshops, service and breakdown service vehicles



	L mm	B mm	H mm	Weight kg
500.8002	1022.0	440.0	40.0	1.05

**CREEPERS / STOOLS**

**Mobile workshop stool**

- Robust and mobile stool
- Storage area for the protection of tools and small parts
- Washable cushion
- Four ball bearing solid rubber wheels
- Maximum capacity up to 90 kg
- Construction from robust steel square tube



	L mm	B mm	H mm	Weight kg
500.8020	440.0	360.0	360.0	4.00

**Mobile and height adjustable workshop stool**

- Robust and mobile stool
- Storage area for the protection of tools and small parts
- Washable cushion
- Hydraulic height adjustment
- Five ball bearing solid rubber wheels
- Maximum capacity up to 90 kg
- Durable metal construction



	B mm	H mm	Weight kg
500.8030	370.0	540.0	4.00

**Workshop creeper**

- Padded head support
- Shaped arm areas for optimal movement freedom
- Includes safe tool recesses
- Six low sound, oil and acid resistant solid rubber direct wheels
- Easy to clean
- Ideal for comfortable working under the vehicle
- Maximum capacity up to 120 kg
- Solid construction made from plastic



	L mm	B mm	H mm	Weight kg
500.8090	1030.0	480.0	115.0	5.00

**Workshop creeper and folding seat**

- For the use of lying and sitting
- Interlocking mechanism against accidental loosening
- Padded execution for fatigue free working
- Tool storage tray in the foot well
- Washable cushion
- Shallow depth for comfortable working under the vehicle
- Adjustable head rest
- Seven low sound, oil and acid resistant solid rubber direct wheels
- Black powder coated metal frame



	L mm	B mm	H mm	Weight kg
500.8000	1200.0	430.0	145.0	12.40



**VEHICLE TROLLEYS**

**Wheel roller set**

- Direct rolls enable the movement in the narrowest of areas
- Ideally for the maneuvering of vehicles on firm ground
- For the space saving storing of vehicles in repair workshops
- Four ball bearing solid rubber wheels



**Technical data:**

Max. tyre size: 13" - 16"  
Wheel diameter: 90.0 mm

	Max load 1 pers./kg	Max load 2 pers./kg	Wheel tyre width mm	Weight kg
160.0375	450.0	1800.0	360.0	10.00

**Hydraulic vehicle mover**

- Universally applicable on driver and passenger side
- Casters allow for the manoeuvring of vehicles in the tightest spaces
- Ideal for manoeuvring vehicles on solid ground
- Easily rolled in any direction
- For the space-saving storage of vehicles in repair breaks
- Ideal for showrooms, body shops, towing companies, etc.
- Easy operation via foot pedal
- With self-lubricating ball bearings
- Four ball bearing solid rubber casters
- With plastic rollers



**Technical data:**

Tyre size: 13" - 19"  
Wheel diameter: 720 mm

	Max load 1 pers./kg	Max load 2 pers./kg	Wheel tyre width mm	Weight kg
160.0412	680	2720	228	16.60

**Hydraulic vehicle mover**

- Universally applicable on driver and passenger side
- Casters allow for the manoeuvring of vehicles in the tightest spaces
- Ideal for manoeuvring vehicles on solid ground
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- For the space-saving storage of vehicles in repair breaks
- Ideal for showrooms, body shops, towing companies, etc.
- Easy operation via foot pedal
- With self-lubricating ball bearings
- Four ball bearing solid rubber casters
- With plastic rollers



**Technical data:**

Tyre size: 13" - 19"  
Wheel diameter: 720 mm

	Max load 1 pos./kg	Max load 4 pos./kg	Wheeler tyre width mm	
160.0413	680	2720	305	16.60

**Hydraulic vehicle mover**

- Universally applicable on driver and passenger side
- Casters allow for the manoeuvring of vehicles in the tightest spaces
- Ideal for manoeuvring vehicles on solid ground
- Easily rolled in any direction
- For the space-saving storage of vehicles in repair breaks
- Ideal for showrooms, body shops, towing companies, etc.
- Easy operation via foot pedal
- With self-lubricating ball bearings
- Four ball bearing solid rubber casters
- With aluminum rollers



**Technical data:**

Tyre size: 13" - 19"  
Wheel diameter: 720 mm

	Max load 1 pos./kg	Max load 4 pos./kg	Wheeler tyre width mm	
160.0414	680	2720	305	18.44

**Storage and Trolley for vehicle mover**

- Universally applicable
- Casters allow for manoeuvring
- Easily rolled in any direction
- For the space-saving housing of hydraulic vehicle movers
- Suitable for 4 vehicle movers
- With self-lubricating ball bearings
- Four ball bearing solid rubber casters



	Length mm	Width mm	Height mm	
160.0415	800.0	470.0	230.0	9.64

**WHEEL CHOCKS**

**Underlaid sheet metal wedge (pair)**

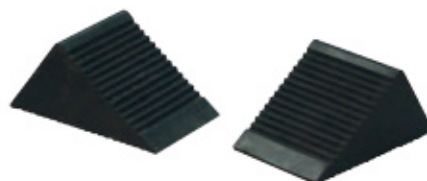
- For securing large vehicles and for load securing
- Optimal slip resistance
- Perforated support surface
- No deformation, no rusting
- Delivery takes place in pairs
- Heavy version
- Made of sturdy sheet



	Length mm	Height mm	Width mm	
160.0381	230.0	220.0	125.0	700

**Underlaid rubber wedge (pair)**

- For securing trailers, vehicles and for load securing
- Optimal slip resistance
- Gridded support surface
- No deformation, no rusting
- More durable than plastic or sheet metal wedge
- Delivery takes place in pairs
- Made of solid rubber



	Length mm	Height mm	Width mm	
160.0382	105.0	75.0	75.0	660

**Underlaid rubber wedge with handle**

- For securing trailers, vehicles and for load securing
- Optimal slip resistance
- Incorporated handle for easy transport
- Gridded support surface
- No deformation, no rusting
- More durable than plastic or sheet metal wedge
- Delivery takes place in parts
- Heavy version
- Made of solid rubber



	Length mm	Height mm	Width mm	
160.0383	200.0	150.0	100.0	2.20

**AXLE STANDS AND RAMPS**

**Aluminium axle stand set**

- Especially light and stable
- High level of stability due to the diameter of the base plate
- Safety locking bolt with chain
- Suits itself especially well in combination with jack for the safe bracing of a load
- Aluminium



	Max load t	Stroke adjust mm	Min. total height mm	Max. total height mm	
160.0315	3.0	140.0	260.0	400.0	2.20

**Steel chassis stand with quick lock**

- Solidly built
- For heavy vehicle weights
- High level of stability due to large sturdy base plate
- Support bar made of cast steel
- Quickly adjustable
- 13-stage quick clamping lever
- Particularly suitable in combination with car jacks
- For the safe bracing of a load
- Delivery takes place in parts
- Made of solid steel
- 160.0377 / 160.0378 with turnstile



	Max load t	Min. total height mm	Max. total height mm	
160.0373	10	450.0	750.0	21.50
160.0374	10	650.0	1100.0	26.50
160.0377	20	420.0	660.0	29.00
160.0378	20	665.0	1170.0	29.00
160.0379	25	415.0	640.0	25.50
160.0380	25	675.0	1050.0	35.50



**Spindle support stand**

- Variably adjustable via spindle
- 3-foot chassis stand
- Solidly built
- For heavy vehicle weights
- High level of stability
- Collapsible, so saves a lot of space
- Is particularly suitable in combination with jacks for securing and supporting a load
- Made of solid steel



	Max load t	Min total height mm	Max total height mm	kg
160.0441	12,0	456,0	710,0	17,00
160.0442	12,0	710,0	1065,0	25,00

**Steel axle stands with quick adjustment**

- 4 feet on each stand
- Solid construction
- For heavy vehicles weights
- High level of stability
- Lifting bar made from cast steel
- Quick adjustment
- Supplied in pairs
- Height adjustment has 13 stages
- Suits itself especially well in combination with jack for the safe bracing of a load
- Made from solid steel



	Max load t	Stroke way mm	Min total height mm	Max total height mm	kg
160.0370	3,0	130,0	295,0	425,0	8,00
160.0371	6,0	205,0	400,0	605,0	15,00
160.0372	12,0	250,0	480,0	730,0	26,00

**Cars ramp with 185 mm tyre width**

- Robust welded, stable and painted steel construction
- For flexible use
- Can be loaded with 1 t individually or 2 t in pairs
- Design with 185 mm ramp width
- Supplied in pairs
- For all common passenger cars and small transporters



**Technical data:**

max. load capacity / 1 piece: 1.000 kg  
 max. load capacity / 2 pieces: 2.000 kg  
 Max. Tyre width: 185 mm

	Length mm	Width mm	Height mm	kg
160.0314	950,0	290,0	265,0	5,20

**Cars ramp with 225 mm tyre width**

- Robust welded, stable and painted steel construction
- For flexible use
- Can be loaded with 1 t individually or 2 t in pairs
- Design with 225 mm ramp width
- Supplied in pairs
- For all common passenger cars and small transporters



**Technical data:**

max. load capacity / 1 piece: 1.000 kg  
 max. load capacity / 2 pieces: 2.000 kg  
 Max. Tyre width: 225

	Length mm	Width mm	Height mm	kg
160.0319	950,0	340,0	265,0	7,90



**Foldable ramps**

- Robust steel design
- Anti-slip with holes in the surfaces with lateral grooves
- Can be folded together
- Easy to transport with carry handle
- Supplied in pairs
- Can be folded out for loading small items such as lawn mowers, motorcycles, etc.
- Usable as car ramp when folded

**Technical data:**

Ramp height in trestle position with brake block: 160 mm  
 Support wheel surface in trestle position: L 430 x W 250 mm  
 Total length in loading position: 1.95 m  
 Max. load in trestle position/pair: 1.600 kg  
 Max. load as ramp/pair: 520 kg



	Length mm	Width mm	Height mm	kg
160.0318	580,0	250,0	160,0	31,00

**LIFT TECHNOLOGY**

**Scissor steel jack with lever**

- Robust steel spindle
- For all common passenger cars and small transporters
- Light and compact shape



**Technical data:**

max. load: 1500 kg  
 Travel: 330,0 mm

	Length mm	Width mm	Height mm	kg
160.0704	420,0	85,0	110,0	2,26

**Hydraulic bottle jack 2 - 100 t**

- Security valve against overload
- Telescopic piston pole
- Additional spindle for extension (not in 30 and 50 t executions)
- Two piece lever arms
- For heavy vehicles weights
- Especially suitable for narrow hard to access areas
- High level of stability
- Ideally suited in combination with jack for the neutralizing and bracing of a load
- Heavy steel construction



	Max load t	Min total height mm	Max total height mm	Hydraulic lift mm	Screw extension mm	Dimension of base plate mm	kg
160.0350	2,0	181,0	345,0	116,0	48,0	88 x 92	2,90
160.0351	3,0	194,0	372,0	118,0	60,0	92 x 100	3,80
160.0352	5,0	216,0	413,0	127,0	70,0	96 x 112	5,10
160.0354	10,0	230,0	460,0	150,0	80,0	110 x 127	7,10
160.0356	15,0	230,0	460,0	150,0	80,0	113 x 136	9,30
160.0358	20,0	242,0	452,0	150,0	60,0	144 x 155	11,90
160.0359	30,0	285,0	465,0	180,0	-	190 x 155	21,70
160.0360	50,0	300,0	480,0	180,0	-	218 x 176	30,70
160.0349	100,0	335,0	515,0	180,0	-	240 x 260	35,50

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**Hydraulic vehicle mover**

- Universally applicable on driver and passenger side
- Casters allow for the manoeuvring of vehicles in the tightest spaces
- Ideal for manoeuvring vehicles on solid ground
- Easily rolled in any direction
- For the space-saving storage of vehicles in repair breaks
- Ideal for showrooms, body shops, towing companies, etc.
- Easy operation via foot pedal
- With self-lubricating ball bearings
- Four ball bearing solid rubber casters
- With plastic rollers



**Technical data:**

Tyre size: 13" - 19"  
Wheel diameter: 720 mm

	Max load 1 pos./kg	Max load 4 pos./kg	Wheeled width mm	kg
160.0412	680	2720	228	16.60

**Hydraulic vehicle mover**

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- Easy operation via foot pedal
- With self-lubricating ball bearings
- Four ball bearing solid rubber casters
- With aluminum rollers



**Technical data:**

Tyre size: 13" - 19"  
Wheel diameter: 720 mm

	Max load 1 pos./kg	Max load 4 pos./kg	Wheeled width mm	kg
160.0414	680	2720	305	18.44

**Storage and Trolley for vehicle mover**

- Universally applicable
- Casters allow for manoeuvring
- Easily rolled in any direction
- For the space-saving housing of hydraulic vehicle movers
- Suitable for 4 vehicle movers
- With self-lubricating ball bearings
- Four ball bearing solid rubber casters



	Length mm	Width mm	Height mm	kg
160.0415	800.0	470.0	230.0	9.64

**Hydraulic aluminium trolley jack**

- Especially light aluminum jack
- Shallow depth for comfortable working under the vehicle
- Large base for safe standing
- Controlled releasing through the turning of the pump lever
- Raising with small pump lifts to the maximum height
- Good maneuverability through two oil and acid resistant nylon direct castors
- Integrated screw tray
- The lower area of the pump lever is coated with foam material
- Lifting plate diameter 120 mm
- Problem free movement due to lightweight and secure handling
- Ideally suited for the use in service vehicles and workshop use
- Extremely heavy aluminium construction



	Max capacity t	Stroke exp. mm	Min total height mm	Max total height mm	Total length mm	Clearance lifting plate	kg
160.0365	2.0	385.0	85.0	470.0	630.0	160.0361	20.00
160.0369	3.0	405.0	100.0	510.0	690.0	160.0361	26.00

**Hydraulic steel trolley jack 3 t**

- Large base for safe standing
- Controlled releasing through the turning of the pump lever
- Raising with small pump lifts to the maximum height
- Good maneuverability through two oil and acid resistant nylon direct castors
- Integrated screw tray
- The lower area of the pump lever is coated with foam material
- Lifting plate diameter 140 mm
- Overload protection through pressure relief valve
- Ideally suited for daily workshop use
- Heavy steel construction



	Max capacity t	Stroke exp. mm	Min total height mm	Max total height mm	Total length mm	Clearance lifting plate	kg
160.0366	3.0	410.0	125.0	535.0	720.0	160.0362	43.00



**Hydraulic steel trolley jack**

- Very shallow depth for comfortable working under the vehicle
- Large base for safe standing
- Raising with the pump lever and foot lever is possible
- Foot pedal for the bridging of the empty stroke
- Controlled releasing through the turning of the pump lever
- Raising with small pump lifts to the maximum height
- Good maneuverability through two oil and acid resistant nylon direct castors
- Integrated screw tray
- The lower area of the pump lever is coated with foam material
- Lifting plate diameter 120 mm
- Overload protection through pressure relief valve
- Ideally suited for daily workshop use
- Heavy steel construction



	Max capacity kg	Stroke way mm	Min total height mm	Max total height mm	Total length mm	Span along plate mm	Weight kg
160.0367	2,0	420,0	70,0	490,0	700,0	160.0363	43,00
160.0368	3,0	440,0	90,0	530,0	800,0	160.0363	54,00

**Hydraulic steel trolley jack**

- Slightly lower load depth for modern automobile car bodies
- Large base for safe standing
- Automatic ventilation of the hydraulic systems
- Overload protection through overload pressure valve
- Raising with the hand and foot lever is possible
- Foot pedal for the bridging of the empty stroke
- The lower area of the pump lever is coated with foam material
- Controlled releasing through the turning of the pump lever
- Lifting plate diameter 140 - 170 mm
- Good maneuverability through oil and acid resistant nylon direct castors
- Ideally suited for daily workshop use
- Durable steel construction



	Max capacity kg	Stroke way mm	Min total height mm	Max total height mm	Total length mm	Span along plate mm	Weight kg
160.0702	5,0	400,0	160,0	560,0	1481,0	160.0702-007	125,00
160.0703	10,0	400,0	170,0	570,0	1560,0	160.0702-007	170,00

**Hydraulic transmission jack**

- Ideal for installing and removing motors, transmissions, couplings, etc.
- Uncomplicated lifting with hydraulic foot pump
- Continuous adjustment allows for precise positioning
- Slow release of the load possible with hand wheel
- Includes overload valve
- With integrated safety stop handle
- High stability due to wide wheel spacing
- Good maneuverability through four oil and acid resistant nylon direct castors
- Extra-large covering for lifting
- Wide wheel spacing ensures more stability and manoeuvrability when loaded
- Robust shape



	Max load kg	Min total height mm	Max total height mm	Width mm	Weight kg
160.0327	300	1200,0	2040,0	610,0	32,00
160.0324	500	1200,0	2040,0	610,0	34,00
160.0329	1000	1200,0	2040,0	610,0	48,00

**Hydraulic transmission lever with adjustable and inclining table**

- Ideal for the safe installing and removing of motors, transmission, couplings, etc.
- Tough design
- Uncomplicated lifting with hydraulic foot pump
- Continuous adjustment allows for precise positioning
- Especially wide working area
- Slow release of the load possible with the foot pump
- Includes overload valve
- With integrated safety stop handle
- Ground plate can be inclined -10°/+20°
- Includes 420 mm wide support rail with support chains for secure tensioning
- Chains can be adjusted from 130-430 mm
- High stability due to wide wheel spacing
- Transmission holder attached to the piston rod
- Includes transmission holder
- Good manoeuvrability through four oil and acid resistant nylon direct castors
- Extra-large covering for lifting
- Wide wheel spacing ensures more stability and manoeuvrability when loaded
- Robust shape



	Max load kg	Min total height mm	Max total height mm	Length mm	Width mm	Weight kg
160.0334	500	880,0	1870,0	700,0	800,0	67,00

**Hydraulic aluminium trolley jack 3 t**

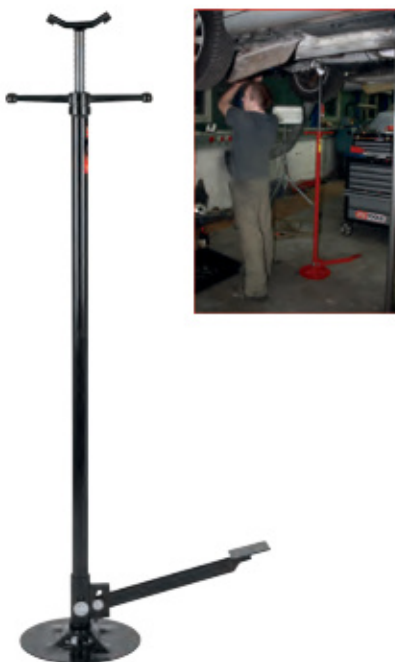
- Especially light aluminium jack
- Shallow depth for comfortable working under the vehicle
- Large base for safe standing
- Controlled releasing through the turning of the pump lever
- Raising with small pump lifts to the maximum height
- Good maneuverability through two oil and acid resistant full steel direct castors
- Integrated screw tray
- The lower area of the pump lever is coated with foam material
- Lifting plate diameter 120 mm
- Problem free movement due to lightweight and secure handling
- Ideally suited for the use in service vehicles and workshop use
- Extremely heavy aluminium construction



	Max capacity kg	Stroke way mm	Min total height mm	Max total height mm	Total length mm	Span along plate mm	Weight kg
160.0305	3,0	360,0	105,0	465,0	680,0	160.0317	33,00

**Underhoist stand with pedal**

- Ideal for all work under the vehicle when extra support is needed
- Stable trapeze threaded spindle
- Secure stand thanks to the large foot
- Fully adjustable
- Smooth-operating with axial bearings
- Foot pedal for precise adjustments (20 mm)
- The ideal work shop assistant in many situations



	Load capacity kg	Min total height mm	Max total height mm	Weight kg
160.0342	750	1360,0	2030,0	15,00

**ENGINE STAND**

**Engine stand**

- Ideally suited to working on removed engines
- 4 pickup points are adjustable in angle and distance
- Pickup plates mounted at 360°
- Stable construction
- Secure stand in 4 steel castors
- Good manoeuvrability thanks to 2 swivelling castors with clamp brakes
- Less space required when folded



**Technical data:**

max. load: 680 kg

	Length mm	Width mm	Height mm	
160.0364	803.0	688.0	968.0	35.30

**WORKSHOP WINCHES**

**Workshop crane with fixed chassis**

- Hand lever pump for lifting
- Finely controllable reduction valve
- Made out of rectangle pipe, welded frame
- Stable construction
- Safety load hooks
- Telescopic crane jib with 4 sided adjustment of the length
- 2 fixed and 2 controllable castors (due to this there is problem-free positioning over the load to be lifted)
- Flat feet enable a simple access under low vehicles
- Good manoeuvrability due to the ball bearing metal castors
- Adjustable load capacity
- Chassis in slightly splayed form and can be folded away
- Ideal for lifting works in the motor vehicle workshop
- For the removal and replacement engines
- Raising of motorcycles in special works



	Max load kg	H mm	L mm	A mm	
160.0011	1000	1750.0	1550.0	620.0 - 1250.0	100.00

**Folding workshop crane**

- Hand lever pump for lifting
- Finely controllable reduction valve
- Made out of rectangle pipe, welded frame
- Stable construction
- Safety load hooks
- Telescopic crane jib with 4 sided adjustment of the length
- 2 fixed and 2 controllable castors (due to this there is problem-free positioning over the load to be lifted)
- Flat feet enable a simple access under low vehicles
- Good manoeuvrability due to the ball bearing metal castors
- Adjustable load capacity
- Chassis in slightly splayed form and can be folded away
- Ideal for lifting works in the motor vehicle workshop
- For the removal and replacement of engines
- Raising of motorcycles in special works



	Max load kg	H mm	L mm	A mm	
160.0015	1000	1440.0	1550.0	1006.0 - 1330.0	71.00

**Load positioning device**

- Makes balancing the load on the crane easier depending on the shape of the parts to be lifted during installation and assembly
- Easy balance adjustment with the hand lever
- Supplied with 4 load chains
- Axle distance 330 mm
- Can be combined with workshop crane for units like the engine block, transmission, etc.



**Technical data:**

max. load: 500 kg

	Height mm	Width mm	
160.0018	545.0	520.0	5.60

**ENGINE AND TRANSMISSION ENGINES**

**Engine assembly jig**

- The 2 spindles are on specially stored also under load are movable and detectable
- Fast adaptation on the desired engine compartment width due to the adjustable support feet
- Conformity to the strong engine compartment inclination through revolving electro galvanized support feet
- Quick safe and problem free positioning of the engine take off and installation of the transmission without additional exclusion from below
- Locking screw
- Electrostatic powder coating



	Max load kg	Max width mm	
160.0145	400	1460.0	15.20

**Universal engine supporting beam**

- Highest flexibility thanks to adjustable and flexibly positionable construction
- Universal usage
- Simple handling and quick repair
- Hooks rotatable and adjustable in longitudinal direction
- Supporting plates height adjustable with non slip feet
- Secure supporting of engine or transmission
- Assembly and access unhindered below possible, through it to the engine compartment
- Special steel

**Application range:** Timing belt changing, clutch changing, etc.



	L1 mm	L2 mm	H mm	
160.0090	1020.0	510.0	300.0	8.60





**Universal assembly stool**

- Ideal for installing and removing engines, transmission and support frames
- Suitable for transmission jacks with an attachment diameter of 25, 30 and 35 mm
- With four arms that can swivel sideways and can be adjusted in length
- For up to 75 kg
- Support plate height-adjustable with anti-slip support
- Simple handling and quick assembly
- Stable construction
- Special steel



Length mm	Weight kg
160.0146	700.0 - 960.0
	13.00

**USED OIL RUN OFF DEVICE**

**Flexible funnel with aluminium body**

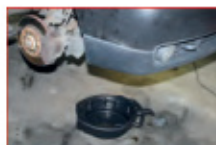
- Ideally suited to a clean and control draining of all fluid, e.g. oil, coolant, brake fluid, fuel, etc.
- Resistant to petrol, diesel, oil, coolant, hydraulic and brake fluid
- Also suitable as a funnel for filling
- Shape is maintained and can be altered at any time
- Free malleable, therefore can be adapted for extremely tight spaces
- Problems with draining fluids are a thing of the past
- The heavy-duty construction can be fitted to any desired shape and used again
- Easy to clean
- Temperature resistance of -34 to +232 °C
- Aluminium frame
- Outer skin made from nitrile rubber



Length mm	Width mm	Weight kg
150.9303	372.0	170.0
		240

**Oil drain pan 7.5 litres**

- With three carry handles
- Safe and clean pouring with the self-contained overflow edge and spout
- Ideally suited to collecting different fluid
- Suitable for oil, chemicals, petrol, acid and anti-freeze fluid
- Also suitable for cleaning parts
- Practical, quick and friendly to the environment
- Shock-proof



	Ø mm	H mm	Weight kg
150.9359	385.0	130.0	620

**Oil drain pan 8 litres**

- With three carry handles
- Safe and clean pouring with the spout
- Ideally suited to collecting different fluid
- Suitable for oil, chemicals, petrol, acid and anti-freeze fluid
- Also suitable for cleaning parts
- Practical, quick and friendly to the environment
- Screwed connection with rubber seal for safe transport
- Shock-proof



	B mm	H mm	L mm	Weight kg
150.9357	340.0	120.0	600.0	1.06

**Oil drain pan 17 litres**

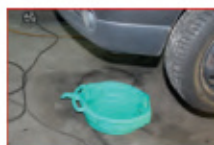
- With three carry handles
- Safe and clean pouring with the self-contained overflow edge and spout
- Ideally suited to collecting different fluid
- Suitable for oil, chemicals, petrol, acid and anti-freeze fluid
- Also suitable for cleaning parts
- Practical, quick and friendly to the environment
- Shock-proof



	Ø mm	H mm	Weight kg
150.9360	445.0	145.0	1.16

**Oil drain pan 17 litres**

- With three carry handles
- Safe and clean pouring with the self-contained overflow edge and spout
- Ideally suited to collecting different fluid
- Suitable for oil, chemicals, petrol, acid and anti-freeze fluid
- Also suitable for cleaning parts
- Practical, quick and friendly to the environment
- Shock-proof



	Ø mm	H mm	Weight kg
150.9361	445.0	145.0	1.16



**Mobile oil drain pan, 30 litres, extra flat with castors**

- With three carry handles
- 12.0 cm high, extra flat edges
- Safe and clean pouring with the closed contained and spout
- Ideally suited to collecting different fluid
- Suitable for oil, chemicals, petrol, acid and anti-freeze fluid
- Also suitable for cleaning parts
- With four steerable castors
- Practical, quick and friendly to the environment
- Includes removable sieve
- Screwed connection with rubber seal for safe transport
- Shock-proof



	B mm	H mm	L mm	Weight kg
150.9354	600.0	120.0	850.0	5.60



**Oil drain pan 55 litres, extra fill**

- With four carry handles
- 11.0 cm high, extra fill edges
- Safe and clean pouring with the self-contained overflow edge and spout
- Ideally suited to collecting different fluid
- Suitable for oil, chemicals, petrol, acid and anti-freeze fluid
- Also suitable for cleaning parts
- Practical, quick and friendly to the environment
- Shock-proof
- Polyethylene



	L mm	B mm	H mm	kg
150.9358	1030.0	724.0	110.0	6.80

**Vacuum fluid extractor suction pump 9.5 litre**

- Ideal for quick, clean and simple suction, intake and emptying of fluid
- Suitable for engine oil, transmission oil, hydraulic oil, brake fluid, water, etc.
- For pneumatic use with a compressor or manual use with the integrated hand pump
- Select a suitable probe and suck easily using the vacuum principle
- Suction process automatically stopped when housing is full, preventing fluids from spilling over
- With integrated pressure relief valve for more safety
- With high-quality pump housing and strengthened pump head
- Includes 4 probes for different uses
- Ideally suited to hard-to-reach places thanks to the included, long suction hose
- The suction hose is resistant to petrol and oil
- Polyethylene

**Application range:** Passenger cars, transporters and MPVs, commercial vehicles, tractors, agricultural and construction machinery, industrial uses



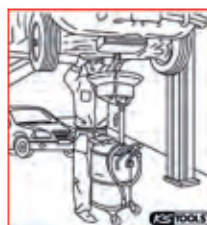
**Technical data:**

Work pressure:	5-11.5 bar
Capacity:	9.5 l
Operating temperature:	+0°C to +55°C
Filling tube length:	1.5 m
Max. fill rate:	125 l/min

	kg
160.0790 5 pcs Vacuum fluid extractor suction pump 9.5 litre	5.00

**Mobile oil draining device 60 litre**

- Basic unit for old oil capture and re-fill
- Pneumatic pressure emptying with manometer and safety valve
- Emptying takes approximately 3 minutes at 0.8 bar
- Heavy deposits can also be removed via a plate on the underside
- Mobile and connectible container with extra-large plastic wheels
- With carry handle
- Stop cock and clamping screws to release pressure
- Extremely manoeuvrable and ideal for workshop design
- Centrally mounted and height-adjustable round drip pan
- Side filling display with measuring scales
- Includes clear fabric hose for draining



**Technical data:**

Capacity of container:	60 l
Capacity of catch:	ca. 16 l
Collection container dimensions:	490 x 580 x 1040 mm
Collection pan dimensions:	Ø 380 mm
Height adjustment:	1040 - 1700 mm

	kg
160.0001 60	32.00

**WORKSHOP EQUIPMENT**

**Mobile cleaning station for small parts**

- Mounted metal reservoir with 60 l tank capacity
- Includes compressed air operated drying pistol
- Cleaning brush with strong bristles
- Emptying of the collecting container by means of pneumatic air
- Includes level indicator display
- Safety valve for the vacuum production and pressure emptying
- High quality 2 m tube and compressed air pistol
- Good maneuverability due to the two solid rubber direct castors
- Storage compartment for small parts
- Includes stop handles
- Especially suitable for use in the car industry
- Ideally suited for removing of stubborn soiling
- Base unit made out of cast iron



**Technical data:**

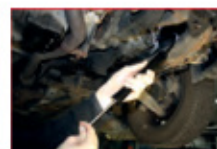
Operating pressure:	6,3 bar (90 psi)
Collecting tank:	500 x 810 x 130 mm

	L mm	B mm	H mm	kg
160.0040	490.0	580.0	1040.0	54.00

**TRANSMISSION OIL FILLING DEVICE**

**Syringe for fluid change 0.2 l**

- Ideal tool for decanting, removing or dosing liquids to transmissions, power steering, hydraulics, engines, etc.
- Suitable for fuel oil, water and antifreeze
- Fine dosing
- Overflowing material can be pumped back problem-free
- Includes rubber hose
- Robust metallic design



	kg
150.1684 0.2	365

**Syringe for fluid change 0.2 l**

- Ideal tool for decanting, removing or dosing liquids to transmissions, engines (sic) power steering, hydraulics, engines, etc.
- Suitable for fuel oil, water and antifreeze
- Fine dosing
- Overflowing material can be pumped back problem-free
- Includes rubber hose with fill stop cap
- Robust PP design



	kg
150.9221 0.2	245

**Syringe for fluid change 1.5 l**

- Ideal tool for decanting, removing or dosing liquids to transmissions, engines (sic) power steering, hydraulics, engines, etc.
- Suitable for fuel oil, water and antifreeze
- Fine dosing
- Overflowing material can be pumped back problem-free
- Includes rubber hose with fill stop cap
- Robust PP design



	kg
150.9222 1.5	900



**DSG transmission oil filli g hose for VAG**

- Ideal for problem-free, simple and clean filli g and refilli g
- Exact dosing
- For different direct shift gearboxes
- The return valve prevents dirtying from unintentional oil spills
- The oil fill a apter is screwed directly onto the 1 litre oil container tank
- Suitable for many manufacturers and industry standard oil container tanks (VAG G 052 182 A2)
- Robust aluminium connection adapter

**Application range:** Audi, Seat, Škoda and Volkswagen with DSG transmission



Transmission thread	Hose length mm	Weight g
150.9220 M24x1,5mm	1500	270

**CVT transmission oil filli g hose for VAG**

- Ideal for problem-free, simple and clean filli g and refilli g
- Exact dosing
- For different stage-free transmission
- The return valve prevents dirtying from unintentional oil spills
- The oil fill a apter is screwed directly onto the 1 litre oil container tank
- Suitable for many manufacturers and industry standard oil container tanks (VAG G 052 180 A2)
- Robust aluminium connection adapter

**Application range:** Audi, Seat, Škoda and Volkswagen with CVT transmission (Multitronic)



Transmission thread	Hose length mm	Weight g
150.9223 M22x1,5mm	2000	360

**Haldex transmission filli g hose for VAG**

- Ideal for problem-free, simple and clean filli g and refilli g
- Exact dosing
- For various Haldex transmissions
- The return valve prevents dirtying from unintentional oil spills
- The oil fill a apter is screwed directly onto the 1 litre oil container tank
- Suitable for many manufacturers and industry standard oil container tanks (VAG G 055 175 A2)
- Robust aluminium connection adapter

**Application range:** Audi, Seat, Škoda and Volkswagen with Haldex transmission



Transmission thread	Hose length mm	Weight g
150.9224 M10x1,0mm	2000	260

**DSG transmission oil filli g hose for Audi**

- Ideal for problem-free, simple and clean filli g and refilli g
- Exact dosing
- For different direct shift gearboxes
- The return valve prevents dirtying from unintentional oil spills
- The oil fill a apter is screwed directly onto the 1 litre oil container tank
- Suitable for many manufacturers and industry standard oil container tanks (VAG G 052 529 A2)
- Robust aluminium connection adapter

**Application range:** Audi (>2008) with DSG transmission



Transmission thread	Hose length mm	Weight g
150.9229 M24x1,5mm	2000	360

**Universal transmission oil filli g system set incl. 15 piece adapter set**

- Ideal for filli g transmission, distributor transmission and differentials of different vehicle manufacturers with oil
- Large coverage of many vehicle manufacturers in particular with universal adapter
- Many transmission cannot be filled wi hout this tool
- Optimal for narrow places or hard-to-reach places
- Includes 15 piece adapter set with various angle tails for correct and economic filli g
- Quick filli g by unscrewing the pump units is possible
- Precise hand pump
- Includes return fl w function
- For diffi ult-to-access areas
- Secure stand thanks to large base
- Container with filli g level scale
- Easy to use and saves time

**Application range:** Audi, Ford, BMW, Mercedes, Volkswagen, Škoda, Volvo, Toyota, Lexus, Nissan, Infiniti y etc.



**Technical data:**  
 Capacity: 7,5  
 Tube length: 1600,0 mm  
 Tube diameter: 1/2"  
 Quantity per stroke: 80 cc  
 Viscosity: - SAE 140

Part number	Description	Weight g
150.9275 16 pcs	Universal transmission oil filli g system set incl. 15 piece adapter set	4.80

**consists of:**

Part number	Description	Weight g
150.9258	Transmission oil filli g device without adapter	3,50
150.9279	Transmission oil filli g adapter set 15 piece	1,30

**Universal transmission oil filli g adapter set**

- Ideal for filli g transmission, distributor transmission and differentials of different vehicle manufacturers with oil
- Large coverage of many vehicle manufacturers in particular with universal adapter
- Many transmission cannot be filled wi hout this tool
- Optimal for narrow places or hard-to-reach places
- With various angle tails for correct and economic filli g
- For diffi ult-to-access areas
- Easy to use and saves time
- In durable plastic storage case

**Application range:** Audi, Ford, BMW, Mercedes, Volkswagen, Škoda, Volvo, Toyota, Lexus, Nissan, Infiniti y etc.



Part number	Description	Weight g
150.9279 15 pcs	Universal transmission oil filli g adapter set	1,30

**consists of:**

Part number	Description	Weight g
150.9261	Adapter pipe straight, Ford, Ø 10 GL=120 x AL = 110 with thread	43
150.9262	Angled adapter pipe, universal, Ø 10 GL = 140 x 45 mm	65
150.9263	Angled adapter pipe, VAG, Ø 10 GL = 150 x 18 mm	58
150.9264	Angled adapter pipe, VAG, Ø 10 GL = 150 x 30 mm	61
150.9265	Adapter pipe straight, VAG, Ø 10 GL = 100 x AL = 85 with thread	33
150.9267	Screw adapter, Mercedes transmission number 722,9, M12 x 1,5	53
150.9268	Screw adapter, VAG DSG, M24 x 1,5	110
150.9269	Screw adapter, VAG CVT, M22 x 1,5	90
150.9271	Screw adapter, Škoda, M18 x 1,5	65
150.9272	Screw adapter, Škoda/VAG, M30 x 1,5	150
150.9273	Flexible universal adapter, 300 mm	35
150.9274	Adapter line for Volvo, 5/16"-24"	22
150.9276	Adapter line for Toyota/Lexus, M18 x 1,5	89
150.9277	Adapter line for Nissan/Infiniti y, M8 x 1,0	25
150.9278	Angled ATF adapter for Volkswagen Passat	93

**OILER**

**Pneumatic tool oil**

- For the lubrication of pneumatic tools
- With lockable nozzle
- Contents 100 ml



Part number	B mm	L mm	Weight g
515.3361	60,0	148,0	250

### Precision oiler

- In ball point pen form
- Practical pocket clip
- Protective cap
- Oil dosage through pushing a button
- Smallest angles and corners reached
- Suitable for a wide range of applications
- Light aluminium housing



	D mm	L1 mm	L2 mm	Weight
550.1035	15.0	140.0	50.0	50

### Metal oil can with pump

- The oil can also be supplied by a pressure lever with a single working pump
- The pump station allows for a dosed drip delivery
- The front curved injection pipe (145 mm) is made from aluminium
- With chrome plated pump handle
- 300 ml capacity
- Ergonomic construction
- Red lacquer



	Content	Height mm	Ø mm	Weight
150.9204	300	100.0	70.0	220

### GREASE GUN

#### Grease nipple cleaner

- For cleaning clogged grease nipples, slides and guides
- Suitable for pressing out of old and hardened grease
- No changing of the grease nipple necessary
- Includes flexible extension
- In durable plastic storage case



	Total length mm	Tube length mm	Weight
980.1015	355.0	145.0	550

### Mini grease gun

- Grease gun for maintenance work
- Precise, exact dosage per pressure button with return spring
- For tubes
- Includes long, rigid nozzle
- Tube contents 100 g



	Replacement tube	Weight
980.1070	980.1075	205

### Mini grease gun set

- Grease gun for maintenance work
- Precise, exact dosage per pressure button with return spring
- For exchangeable cartridges and bucket goods
- Includes long, rigid nozzle and an additional nozzle extension
- Tube contents 110 g



	Content	Weight
980.1095	3 pcs. Mini grease gun set	265

#### accessories:

	Content	Weight
980.1096	Lubricant 110 g	110
980.1097	Replacement tip for mini grease gun, 1 mm	1
980.1098	Replacement tip for mini grease gun long execution	30

### Manual lever grease gun with flexible tube

- For cartridges and buckets and/or also for loose grease
- Fill capacity 400 g
- Flexible tube
- Chrome plated and mirror polished



	D mm	L mm	Weight
980.1010	57.0	370.0	1.30

### Single handed grease gun with rigid grease tube

- Perfect single handed usage
- For cartridges and buckets and/or also for loose grease
- Fill capacity 400g
- Rigid grease tube
- Chrome plated and mirror polished



	D mm	L mm	Weight
980.1020	57.0	350.0	1.80

### Two-hand grease gun

- For working with grease up to NLGI2
- Grease gun piston diameter 10.0 mm
- Quick and clean cartridge changes
- Clean and complete emptying of the cartridge
- Fill levels can be checked at all times
- Ergonomic anti-slip handle



#### Technical data:

Connection thread:	M10 x 1,0
Operating pressure:	400 bar
Burst pressure system (bar):	850 bar
Burst pressure grease gun head (bar):	1200 bar
NLGI class:	< 2
Output per stroke cm <sup>3</sup> :	2.10 cm <sup>3</sup>
Capacity:	500g

	Total length mm	Tube length mm	Weight
980.1021	650.0	300.0	1.06





**Pneumatic grease gun**

- Air exhaust through the handle
- For one handed operation with balanced ergonomic design
- For cartridges and bucket goods and/or also for loose grease
- Includes flexible hose and nozzle
- Cold insulated handle
- Includes 1/4" coupling connector



**Technical data:**

Output pressure:	260 bar
Hauling capacity:	288 cm <sup>3</sup> /min
Capacity:	400g
Air consumption:	170 l/min
Operating pressure:	6,3 bar (90 psi)
Connection thread:	1/4"PT

	B mm	L mm	Weight
515.3900	165.0	400.0	1.50

**Flexible hose with nozzle**

- Made from rubber
- Includes four-jaw nozzle
- For use with the manually operated grease gun



	Thread	Total length mm	Weight
980.1011	M10x1,0	300.0	60
980.1012	M10x1,0	500.0	70

**Nozzle**

- Made from metal
- Four-jaw nozzle
- For use with the manually operated grease gun



	Thread	Weight
980.1013	M10x1,0	30

**Nozzle extension**

- Made from metal
- Includes four-jaw nozzle
- For use with the manually operated grease gun



	Thread	Total length mm	Weight
980.1014	M10x1,0	160.0	70

**Grease gun adaptor set**

- For standard hand, cordless and pneumatic grease guns
- Adaptor with sliding sleeve for break-proof connection
- Straight and angled grease nipple
- For grease nipples out of steel, brass and stainless steel

**Application range:** Cone, funnel, ball and fl t grease nipples



	Weight
980.1100 7 pcs Grease gun adaptor set	1.90

consists of:

	L mm	Weight
980.1101 90° Lubricant adaptor	114.0	150
980.1102 Tube extension, 300 mm	390.0	240
980.1103 Straight extension	155.0	230
980.1104 90° fl t nipple adaptor	135.0	160
980.1105 Rubber grease tip	155.0	150
980.1106 Needle shaped tip	135.0	143
980.1107 360° Adaptor, adjustable	185.0	265

**Cordless grease gun 400 ml**

- Handy and ergonomic dual component housing
- For standard grease cartridges or direct filling
- Ideal for heavy greasing with counter pressure
- With flexible 750 mm filling tube
- Carbon brushes interchangeable
- With lithium ion high performance rechargeable battery
- With a rechargeable battery that can be processed up to 15 cartridges
- Longer running time through higher load capacity
- Fast charging function (1 hour)
- Automatic turn off charging station
- In durable plastic storage case



**Technical data:**

Operating pressure:	420 bar / 42 MPa
NLGI class:	< 2
Grease fill g:	75 g / min
Capacity of the unit:	400 ml
No load current:	3 A
Operating current:	2,0 - 5,5 A
Charging time:	1 hour
Rechargeable battery:	18 V - 3,0 Ah

	L mm	B mm	H mm	Speed carbon brushes set	Battery pack	Number of Charge cycles	Weight
515.3559	237.0	80.0	487.0	515.3596	515.3599	0	5.40
515.3560	237.0	80.0	487.0	515.3596	515.3599	1	6.70
515.3561	237.0	80.0	487.0	515.3596	515.3599	2	7.50

**SUCTION AND FILLING HAND PUMPS**

**Battery cell filler**

- Ideal aid for the drip-free filling or aspiration of battery acid
- Suitable for battery acid and distilled water
- With rubber ball and rubber tube
- Special plastic
- Resistant to oil, petrol and acid



	L1 mm	L2 mm	Weight
160.0738	245.0	130.0	92

**Battery filler bottle**

- Ideal aid for drip-free filling
- Suitable for battery acid and distilled water
- Acid-resistant
- With flexible rubber tube
- Special plastic



	Capacity	Weight
550.1701	1 l	300

**Automatic battery cell filler , 2 litres**

- Ideal aid for drip-free filling
- Stops automatically if the optimal filling level is reached
- With automatic closure
- The built-in special valve in the cylinder head automatically stops the flow when the filling level is reached
- Suitable for battery acid and distilled water
- Acid-resistant
- Special plastic



	Capacity	Weight
550.1683	2 l	300

**Mini transfer pump**

- Ideal aid for transferring in emergencies
- Suitable for battery acid, fuels, oils and distilled water
- The hoses are attached to the balloon holder using supplied hose clamps
- Acid-resistant
- Special plastic



	Tube inner Ø mm	Tube length mm	Weight kg
150.1665	8.0	2 x 900	320

**Transfer pump**

- Ideal aid for easy transferring and pumping
- Suitable for battery acid, fuels, oils and distilled water
- Acid-resistant
- With high quality pump body and reinforced pump handle
- Special plastic



	Tube inner Ø mm	Tube length mm	Weight kg
150.1660	12.0	2 x 1.300	465

**Syringe for fluid change 0.2 l**

- Ideal tool for decanting, removing or dosing liquids to transmissions, power steering, hydraulics, engines, etc.
- Suitable for fuel oil, water and antifreeze
- Fine dosing
- Overflowing material can be pumped back problem-free
- Includes rubber hose
- Robust metallic design



	Tube inner Ø mm	Rubber external Ø mm	Tube length mm	Flowing length mm	Weight kg	
150.1684	0.2	8	10	290	290	365

**Syringe for fluid change 0.2 l**

- Ideal tool for decanting, removing or dosing liquids to transmissions, engines (sic) power steering, hydraulics, engines, etc.
- Suitable for fuel oil, water and antifreeze
- Fine dosing
- Overflowing material can be pumped back problem-free
- Includes rubber hose with flow stop cap
- Robust PP design



	Tube inner Ø mm	Rubber external Ø mm	Tube length mm	Flowing length mm	Weight kg	
150.9221	0.2	6	8	210	210	245

**Syringe for fluid change 1.5 l**

- Ideal tool for decanting, removing or dosing liquids to transmissions, engines (sic) power steering, hydraulics, engines, etc.
- Suitable for fuel oil, water and antifreeze
- Fine dosing
- Overflowing material can be pumped back problem-free
- Includes rubber hose with flow stop cap
- Robust PP design



	Tube inner Ø mm	Rubber external Ø mm	Tube length mm	Flowing length mm	Weight kg	
150.9222	1.5	14	16	320	320	900

**2 direction suction and filling hand pump**

- Ideal for bleeding and filling of fluid
- With ball valve to select between suction and pressure
- Suck and press with every way
- Wear-resistant and temperature resistant
- For difficult to reach openings
- With 2 tubes
- Suction tube clear Ø 1 x E: 10x16 mm, length 600 mm
- Pressure tube fabric-reinforced Ø 1 x E: 16x21mm, length 600 mm
- For brake fluid, motor / transmission oil, petrol, diesel, fuel oils, spirit, petroleum, antifreeze etc.
- Robust aluminum piping

**Application range:** Vehicle/trucks workshops, land and construction machines, municipally and forestry technology, etc.



	Stroke mm	Connect	L mm	Ø mm	Weight kg
150.9255	208.0	256	808.0	40	662
150.9256	255.0	720	855.0	60	884

**Dispense hand pump PVC, 1,000 ml with tube**

- For the controlled bleeding and filling of fluid
- Exact dosage per scale
- High suction
- For difficult to reach openings
- For brake fluid, motor / transmission oil, petrol, diesel, fuel oils, spirit, petroleum, antifreeze etc.
- Fabric-reinforced PVC tube
- PVC cylinder

**Application range:** Vehicle/trucks workshops, land and construction machines, municipally and forestry technology, etc.



**Technical data:**  
 Lift volume: 1,000 ml  
 Stroke: 420.0 mm  
 Scale division: 25 ml  
 Connection thread: M15x1.5IG

	Ø mm	L mm	Weight kg
150.9250	60	465.0	931

**PVC Tube**

- Fabric-reinforced
- For 150.9250



	L mm	Inner Ø mm	Outer Ø mm	Weight kg
150.9253	600.0	10.0	16.0	110

**PVC Tube with curved outlet pipe**

- For difficult to reach openings
- With wing nut and sealing for locking
- With external thread M15 x 1.5
- Robust, curved aluminum piping
- Fabric-reinforced
- Ideal for use with KS dispense hand pump 150.9250

**Application range:** For brake fluid, motor / transmission oil, petrol, diesel, fuel oils, spirit, petroleum, antifreeze etc.



	L mm	Ø mm	Bend radius	Weight kg
150.9252	750.0	10	120*	125



**Metal pipe, flexible with outlet head**

- For difficult to reach openings
- With wing nut and sealing for locking
- With external thread M15 x 1.5
- Durable, flexible steel pipe
- Ideal for use with KS dispense hand pump 150.9250

**Application range:** For brake fluid, motor / transmission oil, petrol, diesel, fuel oils, spirit, petroleum, antifreeze etc.



	L mm	Ø mm	Weight kg
150.9251	250.0	10	82

**PRESSURE PUMP VAPORISER**

**Pressure pump vaporiser**

- Made from high-quality polyethylene
- For various chemicals such as detergents, releasing and cleaning fluid, etc.
- Adjustable and closable brass spray head
- Viton seal



	Weight kg
150.8251	250
150.8252	330

**Pressurised pump vaporiser with carry strap**

- Made from high-quality PE plastic
- For various chemicals such as detergents, releasing and cleaning fluid
- With practical carry strap
- Hose length 1.25 m
- Adjustable and closable spray head
- Spray head made from PP and PE plastic



	Weight kg
150.8261	1.14
150.8262	1.38



**MEASURING BEAKER, JUG AND FUNNEL**

**Measuring cup set**

- Configuration of practical measuring cup sizes
- Versatile application possibilities
- Transparent
- Break-proof
- Red primed scale division
- Resistant to oil, petrol and acid
- With handle and spout
- PE (polyethylene)

**Scales:** L/ml, cups, Oz, quart



L  
ml



	Weight kg
150.9205 3 pcs 250 - 500 - 1000 ml	227

**Single-use colour mixer with cover**

- Single-use colour mixer for mixing all types of paint
- Solvent resistant plastic
- Cover for optimal storage
- With mix scale
- Also suitable for water-based paints



	Material	Colour code	Content	Weight kg
500.8056	polypropylene	transparent	400	25 420
500.8057	polypropylene	transparent	650	25 620
500.8058	polypropylene	transparent	1300	25 1100
500.8059	polypropylene	transparent	2240	25 1700

**Oil can with flexible outlet spout**

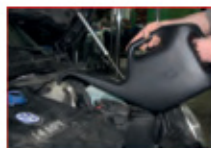
- For a wide range of uses
- Flexible, funnel-shaped spout allows for a clean drainage
- Suitable for oil, chemicals, petrol, acid, anti-freeze fluid and non-acidic fluid
- Break-resistant
- Steady
- Graduated scale
- With practical carry handle
- Special plastic



	Weight kg
150.9234 1	150.9236 150
150.9235 2	150.9236 250

**Water can**

- For a wide range of uses
- Break-resistant
- With 2 carry handles
- Pouring spout enables clean emptying
- Suitable for water and coolant fluid
- Special plastic



	Weight kg
150.9239 9	920

**Funnel set**

- Configuration of practical funnel sizes
- Versatile application possibilities
- Red
- Break-proof
- Resistant to oil, petrol and acid
- Grip strap for convenient use
- HDPE (high density polyethylene)



	Weight kg
150.9240 5 pcs Ø 50 - Ø 75 - Ø 95 - Ø 115 - Ø 150 mm	251

**Universal funnel set**

- Special flexible funnel for hard-to-reach places
- For a wide range of uses
- With bayonet connection and seal
- Direct connection to the oil fill opening
- No more lengthy and time-consuming pouring
- Includes clear hose with sealing plug on the end of the hose
- Bottle with handle for comfortable use
- Reduces loss and dirtying of oily engines
- Special plastic



	Ø Tube mm	Ø mm	Tube length mm	Weight kg		
150.9230	3 pcs	14x16	1	160	400	240



**Polyethylene barrel funnel with sieve**

- Ideal for safely filling 200 litre steel barrels with liquids via the 2" bung hole
- On the contoured surfaces cans or filters can be placed to drain
- The funnel volume of 30 litres allows for quick pouring also of large liquid volumes
- With cover and a sieve to collect coarse particles
- Large diameter, barrel remains clean
- High sides, spray protection
- 100% UV-stable polyethylene, does not corrode



	Height mm	Ø mm	Weight kg	
150.9209	30	150.0	590.0	1.70

**PAPER STANDS**

**Wall bracket for paper cleaning roll**

- For all common paper cleaning rolls
- Wide 220-280 mm roll attachment
- Stable steel pipe frame



	Width mm	Height mm	Depth mm	Weight kg
800.0160	350.0	265.0	230.0	0.93

**Floor stand for paper cleaning roll**

- For all common paper cleaning rolls
- Wide roll attachment of max. 300 mm
- Stable steel pipe frame



	Weight kg	
800.0158	350 x 735 x 390 mm	2.14

**MAGNETIC HOLDERS**

**Metal magnetic holder**

- Creates an organised working area
- Positive and safe mounting
- With 2 exceptionally strong magnets (Ø each 80 mm)
- Has reinforcement on the elevated section
- Impact wrench, sockets and a torque wrench can all be left in their set place



	L mm	Weight kg
800.0190	390.0	1.46

**Plastic magnetic bowl**

- Oblique opening
- For holding screws and other small parts
- Magnetic plate is covered with rubber
- Plastic



	Ø mm	Weight kg
800.0156	150	750

**Stainless steel magnetic tray**

- 1 magnet
- For holding screws and other small parts such as wheel nuts
- Magnetic plate is covered with plastic
- Stainless steel



	Ø mm	Weight kg
800.0150	150.0	430

**Stainless steel magnetic tray**

- 2 magnets
- For holding screws and other small parts such as wheel nuts
- Magnetic plate is covered with plastic
- Stainless steel



	L mm	B mm	Weight kg
800.0151	240.0	140.0	850

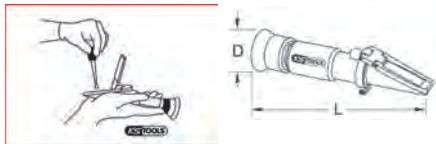




**OPTICAL TEST DEVICE**

**Refractometer - optical tester for battery fluid and antifreeze**

- For the quick and accurate testing of acidity in the battery fluid and the antifreeze content
- Can also be used for coolant and windscreen wiper fluid
- Adjustable eye piece with rubber viewing rest
- With automatic temperature compensation (ATC)
- Also suitable in ambient temperatures of less than 10°C
- Reading correction function by means of bimetallic measurement
- High quality design made from aluminium
- Good readability due to defined dividing lines
- Recalibration possible
- Includes calibration screwdriver and pipette
- In practical plastic case



**Technical data:**

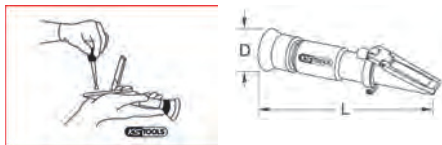
Battery acid:	acid density (measuring range 1.1 to 1.4 kg/l)
Coolant water Propylene:	temperature resistance (measuring range 0° to -50°C)
Coolant water Ethylene:	temperature resistance (measuring range 0° to -50°C)
Windscreen water:	antifreeze (measuring range 0° to -40°C)

	D mm	L mm	Glass face mm	Weight kg
550.1290	40,0	149,0	40 x 13	630

**Refractometer - optical tester for battery fluid, antifreeze and AdBlue® additives**

- For the quick and accurate testing of the acidity of the battery fluid, the antifreeze content and the AdBlue® additives
- Can also be used for coolant and windscreen wiper fluid
- Adjustable eye piece with rubber viewing rest
- With automatic temperature compensation (ATC)
- Also suitable in ambient temperatures of less than 10°C
- Reading correction function by means of bimetallic measurement
- High quality design made from aluminium
- Good readability due to defined dividing lines
- Recalibration possible
- Includes calibration screwdriver and pipette
- In practical plastic case

\*AdBlue® is a registered trademark of the Verband der Automobilindustrie e.V (VDA).



**Technical data:**

Battery acid:	acid density (measuring range 1.1 to 1.3 kg/l)
Coolant water Propylene:	temperature resistance (measuring range -25° to -50°C)
Coolant water Ethylene:	temperature resistance (measuring range -25° to -50°C)
Windscreen water:	antifreeze (measuring range -10° to -40°C)
for AdBlue® additives (VRA):	urea content (measuring range 30% - 35%)

	D mm	L mm	Glass face mm	Weight kg
550.1285	40,0	160,0	40 x 13	480

**BARREL PUMP**

**Chemical barrel pump**

- For water soluble, lightly abrasive types such as anti-freeze, mild acids, glass cleaner, soaps and alkalis
- Pump body made from robust PP
- Seal made from NEOP
- Usable for 200 and 220 litre barrels
- For filling measuring jugs, beakers, canisters, etc.



**Technical data:**

Output per stroke cm³:	200.00 cm³
Output per stroke l/min:	20.0 l/min

	Barrel screw connection	Length of suction pipe mm	Tube length mm	Weight kg
150.8253	G2" a	840,0	1350,0	340



**Steel pipe barrel pump**

- Pump body made from die-cast zinc
- Pump bodies from steel
- All steel parts with galvanised surfaces
- With PVC and NBR seal
- Steel outlet manifold
- For all oils up to SAE90, self-lubricating, non-abrasive types, transmission oil, fuel oil, diesel, etc.



**Technical data:**

Output per stroke cm³:	300.00 cm³
Output per stroke l/min:	16.0 l/min

	Barrel screw connection	Length of suction pipe mm	Weight kg
150.8254	G2" a	480-900	1.73

**Hand cylinder, barrel pump**

- Pump housing made from die-cast zinc
- Suction tube in two parts, can be adjusted
- For 60/200/220 litre containers
- Seal material NBR
- With flexible OVC exhaust hose
- For oils up to SAE 50, self-lubricating, non-abrasive types such as engine oil, machine oil, cutting oil, undiluted anti-freeze fluid



**Technical data:**

Output per stroke cm³:	120.00 cm³
Output per stroke l/min:	12.0 l/min

	Barrel screw connection	Length of suction pipe mm	Tube length mm	Weight kg
150.8255	G2" a / M64x4	1200,0	1000,0	960

**Handle barrel pump**

- Pump housing made from stable grey cast iron
- With sturdy steel outlet manifold
- Suction pipe adjustable via barrel screw
- For 60/200/220 litre containers
- Seal material NBR
- For filling measuring jugs, beakers, canisters, etc.
- For all oils up to SAE90, self-lubricating, non-abrasive types, fuel oil, diesel, petroleum



**Technical data:**

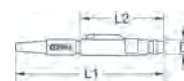
Output per stroke cm³:	250.00 cm³
Output per stroke l/min:	25.0 l/min

	Barrel screw connection	Length of suction pipe mm	Weight kg
150.8256	G2" a	980,0	4.90

**AIR BLOW OUT TOOLS**

**Compressed blow out pen**

- In ball point pen form
- With practical pocket clip
- Controllable air volume
- With 2,5 mm nozzle
- With Euro connection
- Direct air coupling suitable for connection
- Light aluminium housing



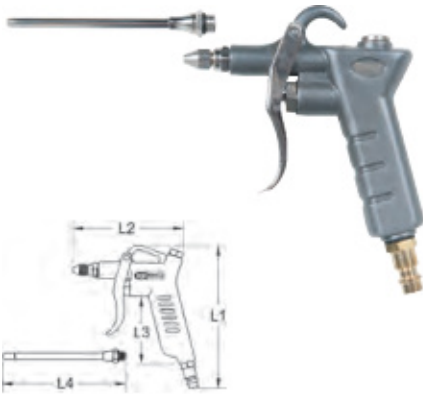
**Technical data:**

Input pressure:	max. 12 bar
Operating pressure:	max. 6,3 bar (90 psi)
Max. flow rate:	360 l/min
Noise pressure level:	90 dbA
Connection thread:	1/4"PT

	D mm	L1 mm	L2 mm	Weight kg
515.1908	10,0	110,0	70,0	150

### Pneumatic blow out pistol with extension

- Ergonomic handle
- Controllable air volume
- With 2,5 mm nozzle
- Direct air coupling suitable for connection
- Easily operated
- With hanging hole
- Includes 1/4" coupling connector
- Solid metal base body
- Robust metal housing



#### Technical data:

Input pressure: max. 15 bar  
 Operating pressure: max. 6,3 bar (90 psi)  
 Max. fl w rate: 130 l/min  
 Noise pressure level: 90 dbA  
 Connection thread: 1/4"PT

	L1 mm	L2 mm	L3 mm	L4 mm	Weight g
515.1930	125.0	110.0	75.0	125.0	180

### Pneumatic blow out pistol with fl w regulation

- With universal mouth piece
- Ideal for cleaning and removing of foreign objects
- Ergonomic handle
- Controllable air volume
- With hanging function
- Direct air coupling suitable for connection
- Easily operated
- Slip proof handle
- Includes 1/4" coupling connector
- Ultra light robust housing from special plastic



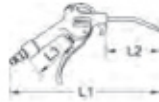
#### Technical data:

Input pressure: max. 15 bar  
 Operating pressure: max. 6,3 bar (90 psi)  
 Max. fl w rate: 300 l/min  
 Noise pressure level: 90 dbA  
 Connection thread: 1/4"PT

	L1 mm	L2 mm	L3 mm	Weight g
515.1901	235.0	100.0	75.0	150

### Universal pneumatic blow out pistol

- Ideal for cleaning and removing of foreign objects
- Ergonomic handle
- Controllable air volume
- With hanging function
- Direct air coupling suitable for connection
- Easily operated
- Slip proof handle
- Includes 1/4" coupling connector
- Ultra light robust housing from special plastic



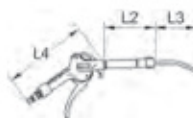
#### Technical data:

Input pressure: max. 15 bar  
 Operating pressure: max. 6,3 bar (90 psi)  
 Max. fl w rate: 300 l/min  
 Noise pressure level: 90 dbA  
 Connection thread: 1/4"PT

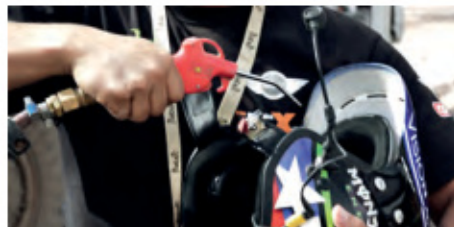
	L1 mm	L2 mm	L3 mm	Weight g
515.1902	235.0	95.0	75.0	170
515.1903	470.0	330.0	75.0	240
515.1904	650.0	510.0	75.0	280

### Telescopic pneumatic blow out pistol

- With stepless extendable nozzle
- Telescopic blast pipe in length and angle adjustable 65 - 280 mm / 360°
- Ideal for cleaning and removing of foreign objects
- Ergonomic handle
- Controllable air volume
- With hanging function
- Direct air coupling suitable for connection
- Easily operated
- Slip proof handle
- Includes 1/4" coupling connector



	L2 mm	L3 mm	L4 mm	Weight g
515.1907	110.0	55.0	140.0	230



### Pneumatic blow out pistol set

- Ideal for cleaning and removing of foreign objects
- Ergonomic handle
- Controllable air volume
- With hanging function
- Direct air coupling suitable for connection
- Easily operated
- Slip proof handle
- Includes 1/4" coupling connector
- Ultra light robust housing from special plastic



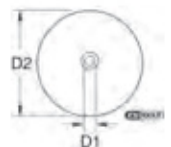
	Weight g
515.1921 3 pcs Pneumatic blow out pistol set	690

#### consists of:

	Weight g
515.1902 Universal pneumatic blowing pistols, 95 mm	170
515.1903 Universal pneumatic blowing pistols, 325 mm	240
515.1904 Universal pneumatic blowing pistols, 500 mm	280

### Protective shield for compressed-blowing pistols

- Optimal protection for fluids spraying back or particles when blowing
- Suitable to be attached on the compressed-air blowing pistol
- Ideal for models with 6 mm nozzle diameter
- Stable protection shield made from see-through plastic
- Safe and easy use



	D1 mm	D2 mm	Weight g
515.1912	6.0	100.0	50

### THERMOMETER

#### Rod thermometer

- Controls temperature of air streams through air channels
- Controls the water temperature
- With long and narrow measuring instruments
- Scale with °C and °F measurements



	L mm	Working range °C	Working range °F	Weight g
150.1963	210.0	0 - 200	0 - 400	27



**Digital rod thermometer**

- Controls temperature of air streams through air channels
- Controls the water temperature
- With long, narrow measuring instruments
- Good readability
- Includes 9V block battery
- Includes hold function
- Includes LCD display



	Length mm	Working range °C	Weight
150.1968	125.5	-50 - 150	145

**Infrared thermometer**

- Laser pistol for non contact temperature measurement
- Ideally suited for the automotive sector, industrial, and construction usage
- Chemical and foodstuffs industry
- Laser measuring beam with a red measuring point
- Illuminating Display
- LCD Digital display
- Automatic switching off
- Includes 9V block battery
- Stable plastic housing

**Application range:** In turning motors, difficult to access places, fluid, under current line directions, in heating appliances, gas and, air-conditioning, coolant systems, brake discs aggressive chemicals and groceries



**Technical data:**

- Switchable: °C / °F
- Working range: -50° - 500 °C
- Emission factor: adjust to 0,95
- Power output max: 1mW
- Power requirement: 9V block battery

	Weight
150.3040	Infrared thermometer 250

**AIR PURIFIER**

**Plasma air-cleaner with ionisator technology**

- Eliminates odours and disinfects the interior of the vehicle
- Compact, lightweight, and high ozone emission
- For use in closed passenger compartments
- In odour elimination mode, it switches off automatically after 60 minutes
- In disinfection mode, it automatically switches off after 30 minutes and immediately switches to odour elimination mode for 30 minutes
- Works without chemical additives, guaranteed to leave no residue
- It leaves no traces, even on sensitive surfaces
- Removes mould, bacteria, fungus and mites
- Includes an active carbon HEPA technology replacement filter
- Simple operation



**Technical data:**

- Dimensions: 173x122x49 mm
- Battery type: Lithium-ion
- Rechargeable battery: 850 mAh
- Operational voltage: DC 12-24V / AC 100-240V / 50/60 Hz
- Power consumption: 5 W
- Ozone transformation: 5 mg/h
- Negative ion concentration: 3000 pcs/cm<sup>3</sup>
- Covering scope: 15m<sup>2</sup>

	Replacement filter	Standard code	Weight
550.1183	550.1199	550.1189	360

**HEAT GUNS**

**Heat blow gun set**

- High-performance hot-air gun with two supply levels
- Seamless temperature regulation
- Adjustment wheel with marking for 6 temperature settings
- Stand for high up-right assembly
- Includes 4 different replacement nozzles

**Application range:** Removing paint, soldering pipes, shrinking PVS, welding and bending plastics, drying, thawing, etc.

**Technical data:**

- Performance: 2000 Watt
- Amperage: 8A
- Operating voltage: 220/240 V (50 Hz)
- Temperature settings: 1=50°C/2=100°C/3=200°C/4=350°C/5=550°C/6=650°C
- Level 1: 200-300 l/min (max. 450°C)
- Level 2: 350-500 l/min (max. 650°C)



	Weight
960.1190	5 pcs Heat blow gun set 1110

**consists of:**

		Weight
960.1191	Heat blow gun	670
960.1192	Wide nozzle 75 mm	20
960.1193	Reflector nozzle	20
960.1194	Reduction nozzle 45 mm	20
960.1195	Reduction nozzle 14 mm	50

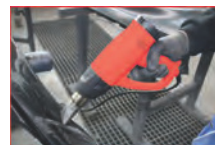
**Digital heat blow gun set**

- High-performance hot-air gun with two supply levels
- Digital seamless temperature regulation
- Includes jig for up-right assembly
- 10 blower levels
- Includes 4 different replacement nozzles
- LCD display

**Application range:** Removing colours, soldering pipes, shrinking PVS, welding and bending plastics, drying, thawing, etc.

**Technical data:**

- Performance: 2000 Watt
- Amperage: 10A
- Operating voltage: 220/240 V (50 Hz)
- Temperature settings: 50-650 °C
- Level 1: 200-300 l/min (max. 450°C)
- Level 2: 350-500 l/min (max. 650°C)



	Weight
960.1175	5 pcs Digital heat blow gun set 850

**consists of:**

		Weight
960.1176	Heat blow gun, digital	740
960.1192	Wide nozzle 75 mm	20
960.1193	Reflector nozzle	20
960.1194	Reduction nozzle 45 mm	20
960.1195	Reduction nozzle 14 mm	50





Innovation is  
our mission!







<b>A</b>		
ABS rotor tool	525	
Accessories for rechargeable-booster packs	395	
Acidimeter for battery fluid	390	
Adapter	539	
Adapter for glow plug bores	247	
Adapter for hydraulic cylinder	506, 520	
Adapter, insulated	432 - 435	
AdBlue refractometer	390	
Adhesive weight remover	667	
Adjustable spanner, VDE	437	
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Air chisel injector pump puller	249	
Air condition leak detector	382	
Air conditioning system tools	382 - 383	
Air purifier	701	
Air vent device	204	
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Alfa Romeo, fastening clips	91	
Alfa Romeo, oil drain plugs	605	
Alfa Romeo, seal rings	605	
Alternator wrench	284	
Ampere meter, digital	399 - 400	
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Assembly spatula	572	
Audi - Engine timing tools	293 - 302	
Audi, fastening clips	91 - 94	
Audi, oil drain plugs	605	
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Automatic wire stripper	421	
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Auxiliary assembly ring	477	
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Axle joint support device	486	
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Axle tracking adjustment tools	487	
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Ball joint ejector	496 - 497	
Ball joint separator	496 - 497	
Ball joint splitter	485	
Ball joint splitter set	499	
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Ball joint system PP II	506 - 508	
Ball joint system PP III	508	
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Battery cell filler	389 - 390, 695	
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Battery chargers	393 - 394	
Battery clamp cleaning brush	388	
Battery plug tools	389	
Battery pole cleaning brush	388	
Battery tester	390 - 393	
Bead hold-down device	665	
Bearing ring tool	527	
Belt disc wrench	167	
Belt sander	77 - 78	
Belt tension checker	286	
Belt tension checker - Engine timing tools	369	
Belt wrench	280	
Bending iron	40	
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Blind rivet tools	69 - 71	
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BMW, oil drain plugs	605 - 607	
BMW, seal rings	605 - 607	
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Bodywork files	60	
Bodywork slitting chisel	41 - 42	
Booster	395	
Booster packs	395	
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Bore jigs	217	
Bores adapter for glow plugs	247	
Boring tools	649	
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Brake assembly sleeves	590	
Brake bleed wrenches	592 - 594	
Brake bleeder	594 - 596	
Brake calliper cleaning	586 - 587	
Brake calliper repair tool	592	



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Brake disc scraper	589	Clamp screws ejector	498
Brake fluid ester	592	Clamping yoke	47, 460
Brake lights removal fork	36	Cleaning brush	80
Brake maintenance tool	596 - 597	Cleaning devices	384
Brake measuring tool	597 - 599	Cleaning guns	80
Brake pedal locking device	586	Cleaning tools	404
Brake pipe bending tool	591	Click and cobra hose clamps	181 - 182
Brake pipe cutter	590	Clip remover	149 - 150
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Brake pipe flaring tool	591 - 592	Clutch aligner tools	472 - 475
Brake pipe tester	585	Clutch centring tools	474 - 475
Brake piston reset tool	576 - 579	Clutch pressure plates	478
Brake saddle fil	587 - 588	Clutch pre-tension jack	474
Brake sensor cleaning tool	579 - 580	Coil spring compressor	487 - 488
Brake spring pliers	585 - 586	Compressor belt disc wrench	167
Brake spring tool	584 - 585	Cone test adapter for cooling systems	161
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<b>C</b>		Coolant water tester	167 - 168
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Cable knife	421	Cooling system cone test adapter	161
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Centring tools	472 - 473	Crank shaft facing tools	218
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Digital precision dial indicator gauge	476	Engine timing tools - Iveco	322 - 323
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Disassembly and assembly tools	404	Engine timing tools - Lancia	324 - 325
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Document pockets	682	Engine timing tools - Mercedes	328
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Drill out tools for glow plugs	272 - 273	Engine timing tools - Peugeot	336 - 339
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985.7029	73				23
985.7034	72				
985.7035	72				
985.7036	72				24
985.7037	72				
985.7038	72				
985.7039	72				25
985.7040	72				
985.7041	72				26



# PRE-TENSIONING FORCE AND TIGHTENING VALUES FOR REGULAR TYPE SCREW HEADS

M (screws ma.)	S (6 pt.)	S2 (Ø screw head)	line threads	stress area	friction coeff. client	quality of setscrews (headless screws) metric standard threads											
						4.8		5.8		6.8		8.8		10.9		12.9	
						pre-tensioning force	torque	pre-tensioning force	torque	pre-tensioning force	torque	pre-tensioning force	torque	pre-tensioning force	torque	pre-tensioning force	torque
						N	Nm	N	Nm	N	Nm	N	Nm	N	Nm	N	Nm
M2	1,5	4	0,40	2,07	0,10	488,0	0,15	610,6	0,19	732,7	0,23	976,9	0,31	1373,8	0,43	1648,6	0,52
						0,14	449,5	0,19	561,9	0,23	674,3	0,28	899,0	0,37	1264,3	0,52	1517,1
M2,5	2	5	0,45	3,39	0,10	813,5	0,31	1016,9	0,39	1220,2	0,47	1627,0	0,63	2288,0	0,88	2745,6	1,06
						0,14	749,9	0,38	937,4	0,48	1124,9	0,58	1499,8	0,77	2109,1	1,08	2531,0
M3	2,5	5,5	0,50	5,03	0,10	1219,9	0,54	1524,9	0,68	1829,9	0,82	2439,9	1,09	3431,0	1,53	4117,2	1,84
						0,14	1125,9	0,60	1407,4	0,83	1688,9	1,00	2251,9	1,34	3166,7	1,88	3800,0
M3,5	-	6	0,60	6,78	0,10	1638,2	0,84	2047,8	1,05	2457,3	1,26	3276,4	1,68	4607,5	2,36	5528,9	2,84
						0,14	1511,3	1,03	1889,2	1,28	2267,0	1,54	3022,6	2,05	4250,6	2,89	5100,7
M4	3	7	0,70	8,78	0,10	2115,4	1,25	2644,3	1,56	3173,1	1,88	4230,8	2,50	5949,6	3,52	7139,5	
						0,14	1950,9	1,53	2438,7	1,91	2926,4	2,29	3901,9	3,06	5487,0	4,30	6584,4
M5	4	8	0,80	14,2	0,10	3461,6	2,46	4327,0	3,08	5192,3	3,70	6923,1	4,93	9735,7	6,93	11682,8	8,32
						0,14	3196,8	3,02	3996,0	3,78	4795,2	4,53	6393,7	6,04	8991,1	8,50	10789,3
M6	5	10	1	20,1	0,10	4874,7	4,24	6093,4	5,30	7312,1	6,35	9749,4	8,47	13710,1	11,92	16452,2	14,30
						0,14	4499,1	5,19	5623,9	6,48	6748,6	7,78	8998,2	10,37	12653,7	14,59	15184,4
M7	-	11	1	28,9	0,10	7134,5	6,97	8918,2	8,71	10701,8	10,45	14269,1	13,94	20065,9	19,60	24079,1	23,52
						0,14	6599,6	8,60	8249,5	10,76	9899,4	12,90	13199,2	17,21	18561,4	24,20	22273,6
M8	6	13	1,25	36,6	0,10	8944,7	10,20	11183,9	12,75	13420,7	15,30	17894,2	20,41	25163,7	28,70	30196,5	34,44
						0,14	8265,6	12,54	10332,0	15,67	12398,4	18,80	16531,2	25,07	23247,0	35,26	27896,5
M10	8	16	1,50	58	0,10	14244,5	20,11	17805,6	25,14	21366,8	30,16	28489,0	40,22	40062,7	56,56	48075,3	67,87
						0,14	13167,4	24,76	16459,2	30,95	19751,1	37,14	26334,8	49,52	37033,3	69,64	44439,9
M12	10	18	1,75	84,2	0,10	20766,6	34,43	25958,3	43,03	31149,9	51,64	41533,2	68,86	58406,1	96,83	70087,3	116,20
						0,14	19204,0	42,42	24005,0	53,03	28806,0	63,63	38408,0	84,84	54011,2	119,31	64813,5
M14	12	21	2	115	0,10	28389,9	54,77	35487,4	68,46	42584,9	82,15	56779,8	109,53	79846,6	154,03	95816,0	184,84
						0,14	26261,2	67,56	32826,5	84,45	39391,8	101,34	52522,4	135,13	73859,6	190,02	88631,5
M16	14	24	2	157	0,10	39242,1	85,14	49052,7	106,43	58863,2	127,72	78484,3	170,29	110368,5	239,47	132442,2	287,36
						0,14	36364,2	105,80	45455,3	132,26	54546,3	158,71	72728,5	211,61	102274,4	297,58	122723,3
M18	14	27	2,50	192	0,10	47533,0	117,48	59416,3	146,85	71299,6	176,22	95066,1	234,96	133686,7	330,41	160424,1	396,49
						0,14	43986,1	145,16	54982,7	181,45	65979,2	217,74	87972,3	290,32	123711,0	402,26	148453,2
M20	17	30	2,50	245	0,10	61238,0	166,08	76547,5	207,61	91857,0	249,13	122476,0	332,17	172231,9	467,11	206678,2	560,54
						0,14	56747,1	206,39	70933,9	257,98	85120,6	309,58	113494,2	412,78	156601,2	580,47	191521,5
M22	17	34	2,50	303	0,10	76305,2	227,22	95381,5	284,02	114457,8	340,82	152610,4	454,43	214608,3	639,05	257530,0	766,85
						0,14	70791,9	283,79	88489,8	354,74	106187,8	425,69	141583,7	567,58	199102,1	798,16	238922,5
M24	19	36	3	353	0,10	88232,4	287,16	110290,5	358,94	132348,6	430,73	176464,9	574,31	248153,7	807,63	297784,4	969,15
						0,14	81761,8	356,84	102202,2	446,05	122642,7	535,26	163523,6	713,68	229955,1	1003,61	275946,1
M27	19	41	3	459	0,10	115778,8	420,04	144723,5	525,05	173668,2	630,06	231557,6	840,08	325627,9	1181,36	390753,4	1417,63
						0,14	107441,5	525,08	134301,9	656,35	161162,2	787,62	214883,0	1050,16	302179,2	1476,79	362615,0
M30	22	46	3,50	561	0,10	140999,5	572,83	176249,4	716,03	211499,3	859,24	281999,0	1145,65	396561,1	1611,08	475873,4	1933,29
						0,14	130770,6	714,49	163463,3	893,11	196155,9	1071,73	261541,2	1428,97	367792,3	2009,49	441350,8
M33	24	50	3,50	694	0,10	175618,1	774,65	219522,6	968,32	263427,1	1161,98	351236,2	15549,31	493925,8	2178,72	592711	2614,46
						0,14	163058,0	970,43	203822,5	1213,03	244587,0	1455,64	326115,9	1940,86	458600,5	2729,33	550320,6
M36	27	55	4	817	0,10	206081,7	998,60	257602,2	1248,25	309122,6	1497,89	412163,5	1997,19	579604,8	2808,55	695525,8	3370,26
						0,14	191241,8	1248,41	239052,3	1560,51	286862,7	1872,61	382483,6	2496,81	537867,6	3511,14	645441,1
M39	-	60	4	976	0,10	247520,0	1291,81	309400,0	1614,77	371279,9	1937,72	495039,9	2583,63	696149,8	3633,23	835379,8	4359,88
						0,14	229902,6	1620,96	287378,3	2026,20	344853,9	2431,44	459805,2	3241,92	646601,0	4558,96	775921,3
M42	32	65	4,5	1120	0,10	283225,0	1601,25	354031,2	2001,57	424837,4	2401,88	566449,9	3202,51	796570,1	4503,53	955884,2	5404,23
						0,14	262939,0	2005,46	328673,8	2506,83	394408,5	3008,20	525878,0	4010,93	739516,0	5640,37	887419,2
M45	-	70	4,5	1310	0,10	332751,5	2005,51	415939,4	2506,89	499127,3	3008,26	665503,0	4011,02	935863,6	5640,50	1120336,0	6768,60
						0,14	309151,8	2519,55	386439,7	3149,43	463727,7	3779,32	618303,6	5039,09	869489,3	7086,23	1043387,0
M48	36	75	5	1470	0,10	372429,3	2406,51	465536,6	3008,14	558644,0	3609,77	744858,6	4813,03	1047457,0	6768,32	1256949,0	8121,98
						0,14	345862,9	3018,11	432328,7	3772,64	518794,4	4527,17	691725,8	6036,23	972739,4	8488,45	1167287,0
M52	-	80	5	1760	0,10	448108,9	3099,96	560136,1	3874,95	672163,4	4649,93	896217,8	6199,91	1260306,0	8718,63	1512368,0	10462,36
						0,14	416499,0	3900,52	520623,8	4875,65	624748,5	5850,78	832998,0	7801,04	1171404,0	10970,21	1405684,0
M56	41	85	5,5	2030	0,10	516202,9	3838,14	645253,6	4797,68	774304,4	5757,21	1032406,0	7676,29	1451821,0	10794,78	1742185,0	12953,73
						0,14	479683,4	4824,40	599604,2	6030,50	719525,1	7236,60	959366,8	9648,80	1349110,0	13568,63	1618931,0
M60	-	90	5,5	36,6	0,10	602498,5	4754,64	753123,1	5943,30	903747,8	7131,96	1204997,0	9509,28	1694527,0	13372,43	2033432,0	1604691
						0,14	560267,5	5992,71	700334,4	7490,88	840401,2	8989,06	1120535,0	11985,42	1575752,0	16854,49	1890903,0
M64	46	95	6	2680	0,10	683339,5	5746,71	854174,4	7182,71	1025009,0	8619,25	1366679,0	11492,34	1921892,0	16161,10	2306271,0	19393,32
						0,14	635299,9	7235,13	794124,9	9043,92	952949,8	10852,70	1270600,0	14470,27	1786781,0	20348,82	2144137,0
M68	-	100	6	3060	0,10	782799,9	6939,64	978499,8	8674,55	1174200,0	10409,46	1565600,0	13879,28	2201625,0	19517,74	2641950,0	23421,29
						0,14	728201,8	8758,24	910252,2	10947,80	1092303,0	13137,36	1456404,0	17516,48	2048		



# PRE-TENSIONING FORCE AND TIGHTENING VALUES FOR FINE THREADS

M (screws ma.)	S (6 pt.)	S2 (Ø screw head)	fine threads	stress area	friction coefficient	quality of setscrews (headless screws) metric fine threads											
						4.8		5.8		6.8		8.8		10.9		12.9	
						pre-tensioning force	torque	pre-tensioning force	torque	pre-tensioning force	torque	pre-tensioning force	torque	pre-tensioning force	torque	pre-tensioning force	torque
						N	Nm	N	Nm	N	Nm	N	Nm	N	Nm	N	Nm
M8	6	13	1	39,2	0,10	9798,1	10,87	12247,6	13,59	14697,1	16,31	19596,1	21,75	27557,1	30,58	33068,5	36,70
					0,14	9079,5	13,53	11349,4	16,91	13619,3	20,29	18159,1	27,05	25536,2	38,04	30643,4	45,65
M10	8	16	1,25	61,2	0,10	15296,9	21,13	12247,6	26,41	22945,3	31,69	30593,8	42,25	43022,5	59,42	51627,0	71,30
					0,14	14175,0	26,27	11349,4	32,84	21262,6	39,41	28350,1	52,55	39867,3	73,89	47840,8	88,67
M10	8	16	1	64,5	0,10	16383,6	22,12	20479,5	27,66	24575,4	33,19	32767,2	44,25	46078,8	62,23	55294,6	74,67
					0,14	15221,6	27,80	19027,0	34,75	22832,5	41,70	30443,3	55,61	42810,8	78,20	51373,0	93,84
M12	10	18	1,50	88,1	0,10	22020,7	35,83	27525,9	44,79	33031,0	53,75	44041,4	71,67	61933,2	100,78	74319,8	120,94
					0,14	20405,8	44,53	25507,2	55,66	30608,7	66,79	40811,6	89,06	57391,3	125,24	68869,5	150,29
M12	10	18	1,25	92,1	0,10	23333,7	37,26	29167,1	46,57	35000,6	55,88	46667,4	74,51	65626,1	104,78	78751,3	125,74
					0,14	21669,2	46,70	27086,5	58,38	32503,8	70,06	43338,4	93,41	60944,6	131,36	73133,5	157,63
M14	10	21	1,50	125	0,10	31610,0	59,04	39512,5	73,80	47415,0	88,57	63220,0	118,09	88903,1	166,06	106683,7	199,27
					0,14	29345,9	73,92	36682,4	92,40	44018,9	110,89	58691,9	147,85	82535,4	207,91	99042,5	249,49
M16	14	24	1,50	167	0,10	42581,3	89,78	53226,6	112,33	63871,9	134,67	85162,5	179,56	119759,8	252,51	143711,8	303,02
					0,14	39587,8	113,06	49484,7	141,32	59381,6	169,59	79175,5	226,12	111340,6	317,98	133608,7	381,57
M18	14	27	2	204	0,10	51457,2	124,03	64321,5	155,03	77185,8	186,04	102914,4	248,06	144723,3	348,83	173668,0	418,59
					0,14	47751,7	155,02	59689,6	193,78	71627,5	232,53	95503,3	310,05	134301,6	436,00	161161,9	523,20
M18	14	27	1,50	216	0,10	55415,1	130,17	69268,9	162,72	83122,7	195,26	110830,3	260,35	155855,1	366,12	187026,1	439,34
					0,14	51577,6	164,67	64472,0	205,84	77366,4	247,01	103155,2	329,35	145062,1	463,15	174074,5	555,77
M20	17	30	2	258	0,10	65534,1	173,72	81917,7	217,16	98301,2	260,59	131068,3	347,45	184314,8	488,60	221177,8	586,32
					0,14	60886,2	218,17	76107,8	272,71	91329,3	327,26	121772,4	436,34	171242,5	613,61	205491,0	736,33
M20	17	30	1,50	272	0,10	70114,7	181,58	87643,3	226,97	105172,0	272,36	140229,3	363,15	197197,5	510,68	236637,0	612,82
					0,14	65319,1	230,55	81648,4	288,19	97978,6	345,82	130638,1	461,10	183709,9	648,42	220451,9	788,10
M22	17	34	2	318	0,10	81220,8	236,88	101526,0	307,53	121831,2	369,04	162441,5	492,05	228433,4	691,94	274120,1	830,33
					0,14	75533,9	298,75	94417,4	391,76	113300,9	470,11	151067,8	626,82	212439,1	881,46	254927,0	1057,75
M22	17	34	1,50	333	0,10	86164,2	246,02	107705,3	385,70	129246,4	462,84	172328,5	617,12	277075,0	867,83	290804,3	1041,40
					0,14	80331,8	313,41	100414,7	487,92	120497,7	585,50	160663,6	780,67	225933,2	1097,82	271119,8	1371,38
M24	19	36	2	384	0,10	98515,6	308,56	123144,5	399,52	147773,4	479,43	197031,1	639,23	277075,0	898,92	332490,0	1078,71
					0,14	91693,3	390,33	114616,6	510,15	137539,9	612,18	183386,5	816,24	257887,3	1147,84	309464,8	1377,41
M24	-	36	1,50	401	0,10	104079,4	319,62	130099,2	399,52	156119,0	479,43	208158,7	639,23	292723,2	898,92	351267,9	1078,71
					0,14	97096,0	408,12	121370,1	510,15	145644,1	612,18	194192,1	816,24	273082,6	1147,84	327699,1	1377,41
M27	19	41	2	496	0,10	127922,3	448,43	159902,9	560,54	191883,5	672,65	255844,7	896,87	359781,6	1261,22	431737,9	1513,46
					0,14	119185,0	569,67	148981,3	712,09	178777,5	854,51	238370,1	1139,34	335207,9	1602,20	402249,5	1922,64
M30	22	46	2	621	0,10	160817,5	623,80	201021,8	779,75	214226,2	935,70	321635,0	1247,60	452299,2	1754,43	542759,0	2105,32
					0,14	149957,0	795,14	187446,3	993,93	224935,5	1192,72	299914,0	15092,29	421754,2	2236,34	506105,0	2683,61
M33	24	50	2	761	0,10	197716,9	835,81	247146,1	1044,76	296575,4	1253,75	395433,8	1671,62	556078,8	2350,72	667294,5	2820,87
					0,14	184490,1	1068,24	230612,6	1335,30	276735,1	1602,36	368980,2	2136,49	518878,4	3004,43	622654,0	3605,32
M36	27	55	3	865	0,10	221916,8	1048,15	277396,0	1310,18	332875,1	1572,22	443833,5	2096,29	624140,9	2947,91	748969,0	3537,49
					0,14	206548,9	1326,13	258186,2	1657,55	309823,4	1989,19	413097,9	2652,26	580918,9	3729,74	697102,7	4475,68
M39	-	60	3	1030	0,10	265219,6	1351,70	331524,5	1689,63	397829,5	2027,56	530439,3	2703,41	745930,2	3801,67	895116,2	4562,00
					0,14	247027,0	1715,15	308783,8	2143,94	370540,4	2572,72	494054,1	3430,30	694763,5	4823,86	833716,1	5788,63
M42	32	65	3	1210	0,10	312529,3	1709,52	390661,6	2136,90	468793,9	2564,28	625058,5	3419,04	878988,6	4808,02	1054786,0	5769,62
					0,14	291268,7	2174,59	364085,9	2718,24	436903,1	3261,89	582537,4	4349,18	819193,3	6116,04	983031,9	7339,24
M45	-	70	3	1400	0,10	362551,7	2118,52	453189,7	2648,14	543827,6	3177,77	725103,5	4237,03	1019677,0	5958,33	1223612,0	7149,99
					0,14	338067,8	2700,72	422584,7	3375,90	507101,7	4051,08	676135,5	5401,43	950815,6	7595,77	1140979,0	9114,92
M48	25	75	3	1600	0,10	415279,0	2581,68	519098,7	3227,11	622918,5	3872,53	830558,0	5163,37	1167972,0	7260,99	1401567,0	8713,18
					0,14	387415,3	3297,46	484269,2	4121,83	581123,0	4946,20	774830,6	6594,93	1089606,0	9274,12	1307527,0	11128,94
M52	-	80	3	1900	0,10	494405,2	3299,14	618006,5	4123,92	741607,8	4948,71	988810,4	6598,28	1390515,5	9278,83	1668618,0	11134,60
					0,14	461482,7	4222,62	576853,3	5278,28	692224,0	6333,94	922965,3	8445,25	1297920,0	11876,13	1557504,0	14251,36
M56	41	85	4	2140	0,10	552738,4	4008,26	690923,0	5010,32	829107,5	6012,39	1105477,0	8016,51	1554577,0	11273,22	1865492,0	13527,87
					0,14	515137,2	5097,95	643921,5	6372,43	772705,8	7646,92	1030274,0	10195,89	1448823,0	14337,98	1738588,0	17205,57
M60	-	90	4	2480	0,10	642235,1	4950,24	802793,9	6187,80	963352,7	7425,36	1284470,0	9900,49	1806286,0	13922,56	2167544,0	16707,07
					0,14	598863,8	6309,01	748579,8	7886,27	898295,7	9463,52	1197728,0	12618,02	1684304,0	17744,10	2021165,0	21292,92
M64	46	95	4	2850	0,10	739716,3	6039,07	924645,4	7548,84	1109574,0	9058,60	1479433,0	12078,14	2080452,0	16984,88	2496543,0	20381,86
					0,14	690084,3	7710,76	862605,3	9638,45	1035126,0	11566,14	1380169,0	15421,52	1940862,0	21686,51	2329034,0	26023,81
M68	-	100	4	3240	0,10	842588,5	7263,31	1053236,0	9079,14	1263883,0	10894,97	1685177,0	14526,62	2369780,0	20428,06	2843736,0	24513,68
					0,14	786380,1	9288,98	982975,1	11611,23	1179570,0	13933,47	1572760,0	18577,96	2211694,0	26125,26	2654033,0	31350,31



# COMPARATIVE TABLE METRIC, AMERICAN AND BRITISH DIMENSIONS

key widths				metric dimensions						
				metric dimensions to DIN ISO 272				thread		ISO R272 1968
specified size = order size (mm)	minimum size (mm) to DIN 475/2/ISO 681	maximum size (mm) to DIN 475/2, series 1	maximum size (mm) to DIN 475/2, series 2	standard hexagon	large hexagon	screw with flange	nut with flange	standard hexagon	small hexagon	NFE27-111-1930
1,5										
2,0	2,02	2,08								
2,5	2,52	2,58								
3	3,02	3,08		1,0						
3,2	3,22	3,28		1,6				1,6		
3,5	3,52	3,60								
4	4,02	4,12		2				2		2,5
4,5	4,52	4,62								
5	5,02	5,12		2,5				2,5		3
5,5	5,52	5,62		3				3		
6	6,03	6,15								3,5
7	7,03	7,15		4		5		4		4+4,5
8	8,03	8,15	8,18	5		6	5	5		5
9	9,03	9,15	9,18							5,5
10	10,04	10,19	10,24	6		8	6	6		6
11	11,04	11,19	11,24	7				7		
12	12,04	12,24	12,30						8	7
13	13,04	13,24	13,30	8		10	8	8		
14	14,05	14,27	14,35						10	8
15	15,05	15,27	15,35			12	10			
16	16,05	16,27	16,35	10						9
17	17,05	17,30	17,40	10				10	12	10
18	18,05	18,30	18,40	12	ZK: M12	14	12			
19	19,06	19,36	19,46					12	14	11
20	20,06	20,36	20,46							
20,8	20,86	21,16	21,26							
21	21,06	21,36	21,46	14	12	16	14			12
22	22,06	22,36	22,46					14	16	
23	23,06	23,36	23,46							14
24	24,06	24,36	24,46	16	14		16	16	18	
25	25,06	25,36	20,46							
26	26,08	26,48	26,58		ZK: M18					16
27	27,08	27,48	27,58	18	16	20		18	20	
28	28,08	28,48	28,58							
29	29,08	29,48	29,58							18
30	30,08	30,48	30,58	20	18		20	20	22	
32	32,08	32,48	32,58					22	24	20
33	33,08	33,48	33,58							
34	34,10	34,6	34,70	22	20					
35	35,10	35,60	35,70							22
36	36,10	36,60	36,70	24	22			24	27	
38	38,10	38,60	38,70							24
41	41,10	41,60	41,70	27	24			27	30	
42	42,10	42,60	42,70							27
46	46,10	46,60	46,70	30	27			30	33	30
50	50,10	50,60	50,70	33	30			33	36	33
54	54,10	54,60	54,70							36
55	55,10	55,72	55,92	36	33			36	39	
58	58,12	58,72	58,92							
60	60,12	60,72	60,92	39	36			39		
63	63,12	63,72	63,92							42
65	65,12	65,72	65,92	42	39			42		
67	67,12	67,72	67,92							45



# COMPARATIVE TABLE METRIC, AMERICAN AND BRITISH DIMENSIONS

key widths			american dimensions									english dimensions				
			ISO R272 1962		United Standard		thread						thread		key widths	
							American Standard 18.2.1972			nuts						
specified size = order size AF <sup>2</sup>	decimal - inch	decimal - metric	bolts	nuts	normal series BS 176B	heavy series BS 176B	finished hick series	heavy series	regular square series	finished and regular bolt series	hexagon head cap screws	finished and heavy bolt series	specified size = order size	BS 916, BS 1082	decimal - inch	decimal - metric
5/64	.0781	1.98														
3/32	.0938	2.38														
7/64	.1094	2.78											10BA		.117	2.97
1/8	.1250	3.18	Nr.2										9BA		.131	3.33
9/64	.1406	3.57														
5/32	.1563	3.97		Nr. 0, 1									8BA		.152	3.86
3/16	.1875	4.76	Nr. 3, 4, 5	Nr. 2, 3									7BA		.172	4.37
13/64	.2031	5.16											6BA		.193	4.90
7/32	.2188	5.56											5BA		.220	5.59
15/64	.2344	5.95											4BA		.248	6.30
1/4	.2500	6.35	Nr. 6, 8	Nr. 4									1/16	3/32	.256	6.50
17/64	.2656	6.75														
9/32	.2813	7.14														
5/16	.3125	7.94	Nr. 10, 12	Nr. 5, 6									3BA		.282	7.16
													3/32	1/8	.297	7.54
													2BA		.324	8.23
													1/8	3/16	.340	8.64
11/32	.3438	8.73		Nr.8									1BA		.365	9.27
3/8	.3750	9.52		Nr.10												
13/32	.4062	10.32											0BA	1/4	.413	10.49
7/16	.4375	11.11	1/4	Nr.12 1/4	1/4		1/4	1/4		1/4			3/16	1/4	.445	11.30
1/2	.5000	12.70	5/16	5/16	5/16		5/16		1/4	5/16			1/4	5/16	.525	13.33
17/32	.5313	13.49														
9/16	.5625	14.29	3/8	3/8	3/8		3/8	5/16	5/16	3/8						
19/32	.5938	15.08											5/16	3/8	.600	15.24
5/8	.6250	15.87	7/16		7/16			3/8		7/16						
21/32	.6563	16.67														
11/16	.6875	17.46		7/16			7/16		3/8							
													3/8	7/16	.710	18.03
3/4	.7500	19.05	1/2	1/2	1/2		1/2	7/16	7/16	1/2						
25/32	.7813	19.84														
13/16	.8125	20.64	9/16		9/16			1/2		9/16			7/16	1/2	.820	20.83
7/8	.8750	22.22		9/16		1/2	9/16	9/16	1/2			1/2				
													1/2	9/16	.920	23.37
15/16	.9375	23.81	5/8	5/8	5/8		5/8		9/16	5/8						
31/32	.9688	24.61														
1	1.0000	25.40						5/8					9/16	5/8	1.010	25.65
													5/8	11/16	1.100	27.94
1.1/16	1.0625	26.99				5/8			5/8			5/8				
1.1/8	1.1250	28.57	3/4	3/4	3/4		3/4	3/4		3/4			11/16	3/4	1.200	30.48
1.3/16	1.875	30.16														
1.1/4	1.2500	31.75				3/4			3/4			3/4				
1.5/16	1.3125	33.34	7/8	7/8	7/8		7/8	7/8		7/8			3/4	7/8	1.300	33.02
1.3/8	1.3750	34.92											13/16	15/16	1.390	35.31
1.7/16	1.4375	36.51				7/8			7/8			7/8				
1.1/2	1.5000	38.10	1	1	1		1	1		1			7/8	1	1.480	37.59
1.9/16	1.5625	39.69														
1.5/8	1.6250	41.28				1			1			1				
1.11/16	1.6875	42.86	1.1/8	1.1/8	1.1/8		1.1/8	1.1/8		1.1/8			1		1.670	42.42
1.3/4	1.7500	44.45														
1.13/16	1.8125	46.04				1.1/8			1.1/8			1.1/8	1.1/8	1.1/4	1.860	47.24
1.7/8	1.8750	47.62	1.1/4	1.1/4	1.1/4		1.1/4	1.1/4		1.1/4						
1.15/16	1.9375	49.21														
2	2.0000	50.80				1.1/4										
2.1/16	2.0625	52.39	1.3/8	1.3/8	1.3/8		1.3/8	1.3/8		1.3/8			1.1/4	1.3/8	2.050	52.07
2.1/8	2.1250	53.98														
2.3/16	2.1875	55.56					1.3/8		1.3/8			1.3/8				
2.5/16	2.3125	58.74														
2.3/8	2.3750	60.32				1.1/2			1.1/2			1.1/2				
2.7/16	2.4375	61.91					1.5/8	1.5/8		1.5/8			1.1/2	1.5/8	2.410	61.21
2.1/2	2.5000	63.50														

## COMPARATIVE TABLE METRIC, AMERICAN AND BRITISH DIMENSIONS

key widths				metric dimensions						
				metric dimensions to DIN ISO 272				thread		ISO R272 1968
specified size = order size	minimum size (mm) to DIN 475/2/ISO 681	maximum size (mm) to DIN 475/2, series 1	maximum size (mm) to DIN 475/2, series 2	standard hexagon	large hexagon	screw with flange	nut with flange	standard hexagon	small hexagon	NFE27-111-1930
70	70,12	70,72	70,92	45				45		
71	71,12	71,72	71,92							48
75	75,15	75,85	76,15	48				48		
77	77,15	77,85	78,15							52
80	80,15	80,85	81,15	52				52		56
82	82,15	82,85	82,15							
85	85,15	85,85	86,15	56				56		
88	88,15	88,85	88,15							60
90	90,15	90,85	91,15	60				60		
94	94,15	94,85	94,15							64
95	95,15	95,85	96,15	64				64		
100	100,15	100,85	101,15	68				68		68
105	105,20	106,00	106,40	72				72		72
110	110,20	111,00	111,40	76				76		76
115	115,20	116,00	116,40	80				80		
116	116,20	117,00	117,40							80
120	120,20	121,00	121,40	85				85		
125	125,20	126,00	126,40							
130	130,20	131,00	131,40	90				90		
135	135,20	136,00	136,40	95				95		
140	140,20	141,00	141,40							
145	145,20	146,00	146,40	100				100		
150	150,25	151,25		105				105		
155	155,25	156,25		110				110		
160	160,25	161,25								
165	165,25	166,25						115		
170	170,25	171,25								
175	175,25	176,25						120		
180	180,25	181,25						125		

## PROFILE DIMENSION TABLE FOR TX-SCREWS

dimensions for internal TX-screws and internal safety TX-screws with pin	
TX / TXB	mm
TX / TXB 5	1,42
TX / TXB 6	1,67
TX / TXB 7	1,99
TX / TXB 8	2,31
TX / TXB 9	2,50
TX / TXB 10	2,74
TX / TXB 15	3,27
TX / TXB 20	3,86
TX / TXB 25	4,43
TX / TXB 27	4,99
TX / TXB 30	5,52
TX / TXB 40	6,65
TX / TXB 45	7,82
TX / TXB 50	8,83
TX / TXB 55	11,22
TX / TXB 60	13,25
TX / TXB 70	15,42

dimensions for external TX-screws	
E / TXE	mm
E / TXE 4	3,86
E / TXE 5	4,75
E / TXE 6	5,74
E / TXE 7	6,22
E / TXE 8	7,52
E / TXE 10	9,42
E / TXE 11	9,98
E / TXE 12	11,17
E / TXE 14	12,90
E / TXE 16	14,76
E / TXE 18	16,70
E / TXE 20	18,49
E / TXE 24	22,16



# COMPARATIVE TABLE METRIC, AMERICAN AND BRITISH DIMENSIONS

key widths			american dimensions									english dimensions					
			thread						thread			key widths					
			ISO R272 1962		United Standard		American Standard 18.2.1972		nuts		bolts + screws		thread		key widths		
specified size = order size AF <sup>-</sup>	decimal - inch	decimal - metric	bolts	nuts	normal series BS 176B	heavy series BS 176B	finished hick series	heavy series	regular square series	finished and regular bolt series	hexagon head cap screws	finished and heavy bolt series	specified size = order size	BS 916, BS 1082	decimal - inch	decimal - metric	
																	2.9/16
2.5/8	2.6250	66.67	1.3/4	1.3/4	1.3/4		1.3/4	1.3/4		1.3/4							
2.3/4	2.7500	69.85				1.3/4			1.3/4				1.3/4	1.3/4	2	2.760	70.1
2.13/16	2.8125	71.44					1.7/8	1.7/8		1.7/8							
2.7/8	2.8750	73.03															
2.15/16	2.9375	74.61							1.7/8			1.7/8					
3	3.0000	76.20	2	2	2		2	2		2							
3.1/8	3.1250	79.37				2			2			2	2	2.1/4	3.150	80.01	
3.1/4	3.2500	82.55															
3.3/8	3.3750	85.72					2.1/4	2.1/4		2.1/4							
3.1/2	3.5000	88.90							2.1/4			2.1/4		2.1/2	3.550	90.17	
3.5/8	3.6250	92.08															
3.3/4	3.7500	95.25					2.1/2	2.1/2		2.1/2				2.3/4	3.890	98.80	
3.7/8	3.8750	98.42							2.1/2			2.1/2					
4	4.0000	101.60															
4.1/8	4.1250	104.77					2.3/4	2.3/4		2.3/4				3	4.180	106.17	
4.1/4	4.2500	107.95							2.3/4			2.3/4					
4.1/2	4.5000	114.30					3	3		3				3.1/4	4.530	115.06	
4.5/8	4.6250	117.47										3					
4.7/8	4.8750	123.82								3.1/4				3.1/2	4.850	123.19	
5	5.0000	127.00								3.1/4							
5.1/4	5.2500	133.35							3.1/2	3.1/2				3.3/4	5.180	131.57	
5.3/8	5.3750	136.52							3.1/2								
5.5/8	5.6250	142.87							3.3/4	3.3/4				4	5.550	140.97	
5.3/4	5.7500	146.05							3.3/4								
6	6.0000	152.40							4	4				4.1/2	6.380	162.05	
									4								
														5	7.300	185.42	



# CONVERSION TABLES FOR TORQUE WRENCHES

conversion factors								
unit	SI unit			metric unit		USA / GB unit		
	cNm	dNm	Nm	cmkg	mkg	ft.lb.	in.lb	in.oz
1 cNm	1,0000	0,1000	0,0100	0,1020	0,0010	0,0074	0,0885	1,4161
1 dNm	10,0000	1,0000	0,1000	1,0197	0,0102	0,0738	0,8851	14,1612
1 Nm	100,0000	10,0000	1,0000	10,1972	0,1020	0,7376	8,8508	141,6123
1 cmkg	9,8067	0,9807	0,0981	1,0000	0,0100	0,0723	0,8680	13,8874
1 mkg	980,6650	98,0665	9,8067	100,0000	1,0000	7,2330	86,7964	1388,7422
1 ft.lb	135,5818	13,5581	1,3558	13,8255	0,1383	1,0000	12,0000	192,0000
1 in.lb	11,2985	1,1298	0,1130	1,1521	0,0115	0,0833	1,0000	16,0000
1 in.oz	0,7062	0,0706	0,0071	0,0720	0,0007	0,0052	0,0625	1,0000

conversion Nm to mkg					1 Nm = 0,10197 mkg					
Nm	0	1	2	3	4	5	6	7	8	9
0	0,00	0,10	0,20	0,31	0,41	0,51	0,61	0,71	0,82	0,92
10	1,02	1,12	1,22	1,33	1,43	1,53	1,63	1,73	1,84	1,94
20	2,04	2,14	2,24	2,35	2,45	2,55	2,65	2,75	2,86	2,96
30	3,06	3,16	3,26	3,37	3,47	3,57	3,67	3,77	3,87	3,98
40	4,08	4,18	4,28	4,38	4,49	4,59	4,69	4,79	4,89	5,00
50	5,10	5,20	5,30	5,40	5,51	5,61	5,71	5,81	5,91	6,02
60	6,12	6,22	6,32	6,42	6,53	6,63	6,73	6,83	6,93	7,04
70	7,14	7,24	7,34	7,44	7,55	7,65	7,75	7,85	7,95	8,06
80	8,16	8,26	8,36	8,46	8,57	8,67	8,77	8,87	8,97	9,08
90	9,18	9,28	9,38	9,48	9,59	9,69	9,79	9,89	9,99	10,10
100	10,2	10,3	10,4	10,5	10,6	10,71	10,81	10,91	11,01	11,11

conversion mkg to Nm					1 mkg = 9,80665 Nm					
mkg	0	1	2	3	4	5	6	7	8	9
0	0	9,81	19,61	29,42	39,23	49,03	58,84	68,65	78,45	88,26
10	98,07	107,87	117,68	127,49	137,29	147,10	156,91	166,71	176,52	186,33
20	196,13	205,94	215,75	225,55	235,36	245,17	254,97	264,78	274,59	284,39
30	294,2	304,01	313,81	323,62	333,43	343,23	353,04	362,85	372,65	382,46
40	392,27	402,07	411,88	421,69	431,49	441,30	451,11	460,91	470,72	480,53
50	490,33	500,14	509,95	519,75	529,56	539,37	549,17	558,98	568,79	578,59
60	588,4	598,21	608,01	617,82	627,63	637,43	647,24	657,05	666,85	676,66
70	686,47	696,27	706,08	715,89	725,69	735,50	745,31	755,11	764,92	774,73
80	784,53	794,34	804,15	813,95	823,76	833,57	843,37	853,18	862,99	872,79
90	882,6	892,41	902,21	912,02	921,83	931,63	941,44	951,25	961,05	970,86
100	980,67	990,47	1000,28	1010,08	1019,89	1029,70	1039,50	1059,12	1059,12	1068,92

conversion Nm to ft.lb.					1 Nm = 0,73756 ft.lb.					
Nm	0	1	2	3	4	5	6	7	8	9
0	0,00	0,74	1,48	2,21	2,95	3,69	4,43	5,16	5,90	6,64
10	7,38	8,11	8,85	9,59	10,33	11,06	11,80	12,54	13,28	14,01
20	14,75	15,49	16,23	16,96	17,7	18,44	19,18	19,91	20,65	21,39
30	22,13	22,86	23,60	24,34	25,08	25,81	26,55	27,29	28,03	28,76
40	29,50	30,24	30,98	31,72	32,45	33,19	33,93	34,67	35,40	36,14
50	36,88	37,62	38,35	39,09	39,83	40,57	41,3	42,04	42,78	43,52
60	44,25	44,99	45,73	46,47	47,2	47,94	48,68	49,42	50,15	50,89
70	51,63	52,37	53,10	53,84	54,58	55,32	56,05	56,79	57,53	58,27
80	59,00	59,74	60,48	61,22	61,96	62,69	63,43	64,17	64,91	65,64
90	66,38	67,12	67,86	68,59	69,33	70,07	70,81	71,54	72,28	73,02
100	73,76	74,49	75,23	75,97	76,71	77,44	78,18	78,92	79,66	80,39

conversion ft.lb. to Nm					1 ft.lb. -> 1,35581 Nm					
ft.lb.	0	1	2	3	4	5	6	7	8	9
0	0,00	1,36	2,71	4,07	5,42	6,78	8,13	9,49	10,85	12,20
10	13,56	14,91	16,27	17,63	18,98	20,34	21,69	23,05	24,40	25,76
20	27,12	28,47	29,83	31,18	32,54	33,90	35,25	36,61	37,96	39,32
30	40,67	42,03	43,39	44,74	46,10	47,45	48,81	50,16	51,52	52,88
40	54,23	55,59	56,94	58,30	59,66	61,01	62,37	63,72	65,08	66,43
50	67,79	69,15	70,50	71,86	73,21	74,57	75,93	77,28	78,64	79,99
60	81,35	82,70	84,06	85,42	86,77	88,13	89,48	90,84	92,20	93,55
70	94,91	96,26	97,62	98,97	100,33	101,69	103,04	104,40	105,75	107,11
80	108,46	109,82	111,18	112,53	113,89	115,24	116,60	117,96	119,31	120,67
90	122,02	123,38	124,73	126,09	127,45	128,80	130,16	131,51	132,87	134,23
100	135,58	136,94	138,29	139,65	141,00	142,36	143,72	145,07	146,43	147,78



# CONVERSION TABLES FOR TORQUE WRENCHES

conversion in.lb. to Nm						1 Nm = 8,85077 in.lb.				
Nm	0	1	2	3	4	5	6	7	8	9
0	0,00	8,85	17,70	26,55	35,40	44,25	53,10	61,96	70,81	79,66
10	88,51	97,36	106,21	115,06	123,91	132,76	141,61	150,46	159,31	168,16
20	177,02	185,87	194,72	203,57	212,42	221,27	230,12	238,97	247,82	256,67
30	265,52	274,37	283,22	292,08	300,93	309,78	318,63	327,48	336,33	345,18
40	354,03	362,88	371,73	380,58	389,43	398,28	407,14	415,99	424,84	433,69
50	442,54	451,39	460,24	469,09	477,94	486,79	495,64	504,49	513,34	522,20
60	531,05	539,90	548,75	557,60	566,45	575,30	584,15	593,00	601,85	610,70
70	619,55	628,40	637,26	646,11	654,96	663,81	672,66	681,51	690,36	699,21
80	708,06	716,91	725,76	734,61	743,46	752,32	761,17	770,02	778,87	787,72
90	796,57	805,42	814,27	823,12	831,97	840,82	849,67	858,52	867,38	876,23
100	885,08	893,93	902,78	911,63	920,48	929,33	938,18	947,03	955,88	964,73

conversion Nm to in.lb.						1 in.lb. -> 0,11298 Nm				
in.lb.	0	1	2	3	4	5	6	7	8	9
0	0,00	0,11	0,23	0,34	0,45	0,56	0,68	0,79	0,90	1,02
10	1,13	1,24	1,36	1,47	1,58	1,69	1,81	1,92	2,03	2,15
20	2,26	2,37	2,49	2,60	2,71	2,82	2,94	3,05	3,16	3,28
30	3,39	3,50	3,62	3,73	3,84	3,95	4,07	4,18	4,29	4,41
40	4,52	4,63	4,75	4,86	4,97	5,08	5,20	5,31	5,42	5,54
50	5,65	5,76	5,87	5,99	6,10	6,21	6,33	6,44	6,55	6,67
60	6,78	6,89	7,00	7,12	7,23	7,34	7,46	7,57	7,68	7,80
70	7,91	8,02	8,13	8,25	8,36	8,47	8,59	8,70	8,81	8,93
80	9,04	9,15	9,26	9,38	9,49	9,60	9,72	9,83	9,94	10,06
90	10,17	10,28	10,39	10,51	10,62	10,73	10,85	10,96	11,07	11,19
100	11,30	11,41	11,52	11,64	11,75	11,86	11,98	12,09	12,20	12,31





## Tightening forces and fastening torque values for metric screws

Reference values for thread friction coefficient  $\mu$  (smallest values)

screw thread		steel					
		blackened or coated with zinc phosphate		ground	cadmium plated 6 $\mu$ m	galvanised 6 $\mu$ m	
nut thread	rolled	press rolled	cut by turning				
	steel	ground	0,14	0,10	0,16	0,10	0,10
rolled and ground		0,14	0,10				
cut by turning		zinc phosphate	lightly oiled				
			0,10				
cut by turning		zinc phosphate	lightly oiled				
			0,10				
cadmium plated					0,14		
galvanised						0,10	
cadmium plated			0,10		0,10	0,14	
galvanised			0,10			0,14	

Reference values for under head friction coefficient  $\mu$  (smallest values)

screw head or nut caps		steel					
		blackened or coated with zinc phosphate		ground	cadmium plated 6 $\mu$ m	galvanised 6 $\mu$ m	
work-piece with sealing run	planed milled turned	pressed	turned				
	steel	ground	0,10		0,10	0,10	0,10
planed milled turned		zinc phosphate	lightly oiled				
			0,10				
ground		zinc phosphate	lightly oiled				
			0,14				
ground		zinc phosphate	0,16	0,10	0,16	0,10	0,10
			0,10				
cadmium plated			0,10	0,10	0,10	0,14	
galvanised			0,10	0,10	0,10	0,16	
cadmium plated			0,10		0,10	0,16	
galvanised		0,10		0,10			
planed milled turned	zinc phosphate	lightly oiled					
		0,10					
ground		0,16	0,10	0,16	0,10	0,10	

### Tightening forces and fastening torque values

Tightening forces  $F_{sp}$  and fastening torque values  $M_{sp}$  for screws having standard metric threads in accordance with DIN 13, page 43 (M1.6-M2.5-M3 to M39) or page 1 (M1.7-M2-M2.3-M2.6) and head cap dimensions such as DIN 912, 931, 934, 6912, 7984, 7990.

The tabulated values  $F_{sp}$  and  $M_{sp}$  are based on the SI unit N (Newton).

1N = 0,102 kp, 1 Ncm = 0,102 kpcm,  
 1Nm = 0,102 kpm, 1 kp = 9,81 N,  
 1kpcm = 9,81 Ncm, 1 kpm = 9,81 Nm.

The tightening forces,  $F_{sp}$ , given in the table on the left, yield a 90% utilisation of the screw yield strength  $\sigma_{0,2}$  (DIN 267) with the comparative tension  $\sigma$  red depending on the respective thread friction coefficient  $\mu$ . The tightening force table can be used to see the screw and its quality that is required for a certain thread friction in order to apply a specific force of assembly,  $F_M$  ( $F_{sp} \geq F_M$ ). The fastening torque values,  $M_{sp}$ , are calculated from the tightening forces,  $F_{sp}$ , assuming that  $\mu = \mu_K + \mu_{ges}$ . The fastening torque,  $M_{sp}$ , for 90% utilisation of the yield strength for a screw having specific dimensions and quality, is determined using the table given on the right side depending on the underhead friction ( $\mu_K$ ), without taking any value of thread friction into consideration that is different from that given here. In order to arrive at the nominal torque value, half the dispersion value of the torque wrench under consideration must be subtracted from the fastening torque,  $M_{sp}$ , found in the table. The calculation of values in the table and notes on their use are in accordance with VDI 2230.

thread friction coefficient $\mu$	tightening force $F_{sp}$ [N]				thread	under head friction coefficient $\mu_K$	fastening torque $M_{sp}$ [N-cm]				
	6,9	8,8	10,9	12,9			6,9	8,8	10,9	12,9	
0,10 0,14 0,16	475 440 420	565 520 495	795 730 700	955 875 840	M 1,6	0,10 0,14 0,16	12,5 15 16	14,5 18 19	21 25 27	25 30 32	
0,10 0,14 0,16	560 520 495	665 610 585	935 860 825	1120 1030 990		M 1,7	0,10 0,14 0,16	15,5 19 20	18,5 22 24	26 31 34	31 38 40
0,10 0,14 0,16	790 730 700	940 865 825	1320 1210 1160	1590 1460 1400			M 2	0,10 0,14 0,16	26 31 34	30 37 40	43 52 56
0,10 0,14 0,16	1140 1050 1010	1350 1250 1190	1900 1750 1680	2280 2100 2020	M 2,3			0,10 0,14 0,16	41 51 54	49 60 65	69 84 91
0,10 0,14 0,16	1320 1220 1170	1570 1450 1380	2210 2030 1950	2650 2440 2340		M 2,5		0,10 0,14 0,16	52 64 69	62 76 82	88 107 115
0,10 0,14 0,16	1460 1350 1290	1730 1600 1530	2440 2250 2150	2930 2700 2580			M 2,6	0,10 0,14 0,16	59 73 78	70 86 93	99 121 130
0,10 0,14 0,16	2020 1860 1790	2390 2210 2120	3370 3110 2980	4040 3730 3580	M 3			0,10 0,14 0,16	92 113 122	109 134 145	154 189 205
0,10 0,14 0,16	2710 2500 2400	3210 2960 2840	4520 4170 4000	5420 5000 4790		M 3,5		0,10 0,14 0,16	142 173 187	168 205 220	235 290 310
0,10 0,14 0,16	3500 3230 3100	4150 3830 3670	5830 5380 5160	7000 6460 6190			M 4	0,10 0,14 0,16	210 260 280	250 305 330	350 430 465
0,10 0,14 0,16	5720 5280 5070	6780 6260 6010	9540 8810 8450	11450 10550 10150	M 5			0,10 0,14 0,16	415 510 550	490 605 650	690 850 915
<b>fastening torque <math>M_{sp}</math> [N-cm]</b>											
0,10 0,14 0,16	8080 7450 7150	9570 8830 8470	13450 12400 11900	16150 14900 14300		M 6	0,10 0,14 0,16	7,1 8,7 9,4	8,5 10,5 11,0	12,0 14,5 15,5	14,5 17,5 19,0
0,10 0,14 0,16	11800 10900 10450	14000 12950 12400	19650 18200 17450	23600 21800 20900	M 7		0,10 0,14 0,16	11,5 14,5 15,5	14,0 17,0 18,5	19,5 24,0 26,0	23,0 29,0 31,0
0,10 0,14 0,16	14800 13700 13150	17550 16200 15550	24700 22800 21900	29600 27400 26300			M 8	0,10 0,14 0,16	17,0 21,0 23,0	20,0 25,0 27,0	29,0 35,0 38,0
0,10 0,14 0,16	23600 21800 20900	27900 25800 24800	39300 36300 34900	47200 43600 41800		M 10		0,10 0,14 0,16	34,0 42,0 46,0	41,0 50,0 54,0	57,0 71,0 76,0
0,10 0,14 0,16	34400 31800 30500	40700 37700 36100	57300 53000 50800	68700 63500 61000	M 12			0,10 0,14 0,16	59,0 73,0 79,0	70,0 87,0 94,0	99 122 132
0,10 0,14 0,16	47200 43600 41900	55900 51700 49600	78600 72700 69800	94300 87300 83800			M 14	0,10 0,14 0,16	94 117 126	112 138 150	157 195 210
0,10 0,14 0,16	64800 60100 57700	76800 71200 68400	108000 100000 96100	129500 120000 115500		M 16		0,10 0,14 0,16	144 179 194	170 210 230	240 300 325
0,10 0,14 0,16	78900 73000 70100	93500 86500 83000	131500 121500 117000	157500 146000 140000	M 18			0,10 0,14 0,16	199 245 265	235 290 315	330 410 445
0,10 0,14 0,16	101500 93900 90100	120000 111000 107000	169000 156500 150000	202500 187500 180500			M 20	0,10 0,14 0,16	280 350 375	330 445 445	465 580 625
0,10 0,14 0,16	126500 117500 112500	150000 139000 133500	211000 195500 188000	253000 235000 225000		M 22		0,10 0,14 0,16	375 470 510	445 555 605	625 785 850
0,10 0,14 0,16	146000 135000 130000	173000 160000 154000	243000 225000 216000	292000 270000 260000	M 24			0,10 0,14 0,16	480 560 650	570 710 770	800 1000 1080
0,10 0,14 0,16	192000 178000 171000	227000 211000 203000	320000 297000 285000	384000 356000 342000			M 27	0,10 0,14 0,16	710 890 965	840 1050 1140	1180 1480 1610
0,10 0,14 0,16	233000 216000 208000	276000 256000 246000	389000 361000 346000	466000 433000 416000		M 30		0,10 0,14 0,16	965 1200 1310	1140 1430 1550	1610 2010 2180
0,10 0,14 0,16	291000 270000 259000	344000 320000 307000	484000 450000 432000	581000 539000 518000	M 33			0,10 0,14 0,16	1300 1630 1770	1540 1940 2100	2170 2720 2950
0,10 0,14 0,16	341000 316000 304000	404000 375000 360000	568000 527000 507000	682000 633000 608000			M 36	0,10 0,14 0,16	1680 2100 2300	1990 2490 2700	2790 3500 3790
0,10 0,14 0,16	410000 380000 366000	485000 451000 433000	663000 634000 610000	819000 761000 731000		M 39		0,10 0,14 0,16	2170 2720 2960	2570 3220 3500	3610 4540 4930



# Conversion table from inches to millimetres

Conversion example from mm to inches: 69,850 mm = 2.3/4"  
 Conversion example from inches to mm: 4.1/2" = 114,300 mm

inch	mm	1	2	3	4	5	6	7	8	9
		millimetres								
0	0	25,400	50,800	76,200	101,600	127,000	152,400	177,800	203,200	228,600
1/64	0,397	25,797	51,197	76,597	101,997	127,397	152,797	178,197	203,597	228,997
1/32	0,794	26,194	51,594	76,994	102,394	127,794	153,194	178,594	203,994	229,394
3/64	1,191	26,591	51,991	77,391	102,791	128,191	153,591	178,991	204,391	229,791
1/16	1,588	26,988	52,388	77,788	103,188	128,588	153,988	179,388	204,788	230,188
5/64	1,984	27,384	52,784	78,184	103,584	128,984	154,384	179,784	205,184	230,584
3/32	2,381	27,781	53,181	78,581	103,981	129,381	154,781	180,181	205,581	230,981
7/64	2,778	28,178	53,578	78,978	104,378	129,778	155,178	180,578	205,978	231,378
1/8	3,175	28,575	53,975	79,375	104,775	130,175	155,575	180,975	206,375	231,775
9/64	3,572	28,972	54,372	79,772	105,172	130,572	155,972	181,372	206,772	232,172
5/32	3,969	29,369	54,769	80,169	105,569	130,969	156,369	181,769	207,169	232,569
11/64	4,366	29,766	55,166	80,566	105,966	131,366	156,766	182,166	207,566	232,966
3/16	4,762	30,162	55,562	80,962	106,362	131,762	157,162	182,562	207,962	233,362
13/64	5,159	30,559	55,959	81,359	106,759	132,159	157,559	182,959	208,359	233,759
7/32	5,556	30,956	56,356	81,756	107,156	132,556	157,956	183,356	208,756	234,156
15/64	5,953	31,353	56,753	82,153	107,553	132,953	158,353	183,753	209,153	234,553
1/4	6,35	31,750	57,150	82,550	107,950	133,350	158,750	184,150	209,550	234,950
17/64	6,747	32,147	57,547	82,947	108,347	133,747	159,147	184,547	209,947	235,347
9/32	7,144	32,544	57,944	83,344	108,744	134,144	159,544	184,944	210,344	235,744
19/64	7,541	32,941	58,341	83,741	109,141	134,541	159,941	185,341	210,741	236,141
5/16	7,938	33,338	58,738	84,138	109,538	134,938	160,338	185,738	211,138	236,538
21/64	8,334	33,734	59,134	84,534	109,934	135,334	160,734	186,134	211,534	236,934
11/32	8,731	34,131	59,531	84,931	110,331	135,731	161,131	186,531	211,931	237,331
23/64	9,128	34,528	59,928	85,328	110,728	136,128	161,528	186,928	212,328	237,728
3/8	9,525	34,925	60,325	85,725	111,125	136,525	161,925	187,325	212,725	238,125
25/64	9,922	35,322	60,722	86,122	111,522	136,922	162,322	187,722	213,122	238,522
13/32	10,319	35,719	61,119	86,519	111,919	137,319	162,719	188,119	213,519	238,919
27/64	10,716	36,116	61,516	86,916	112,316	137,716	163,116	188,516	213,916	239,316
7/16	11,112	36,512	61,912	87,312	112,712	138,112	163,512	188,912	214,312	239,712
29/64	11,509	36,909	62,309	87,709	113,109	138,509	163,909	189,309	214,709	240,109
15/32	11,906	37,306	62,706	88,106	113,506	138,906	164,306	189,706	215,106	240,506
31/64	12,303	37,703	63,103	88,503	113,903	139,303	164,703	190,103	215,503	240,903
1/2	12,7	38,100	63,500	88,900	114,300	139,700	165,100	190,500	215,900	241,300
33/64	13,097	38,497	63,897	89,297	114,697	140,097	165,497	190,897	216,297	241,697
17/32	13,494	38,894	64,294	89,694	115,094	140,494	165,894	191,294	216,694	242,094
35/64	13,891	39,291	64,691	90,091	115,491	140,891	166,291	191,691	217,091	242,491
9/16	14,288	39,688	65,088	90,488	115,888	141,288	166,688	192,088	217,488	242,888
37/64	14,684	40,084	65,484	90,884	116,284	141,684	167,084	192,484	217,884	243,284
19/32	15,081	40,481	65,881	91,281	116,681	142,081	167,481	192,881	218,281	243,681
39/64	15,478	40,878	66,278	91,678	117,078	142,478	167,878	193,278	218,678	244,078
5/8	15,875	41,275	66,675	92,075	117,475	142,875	168,275	193,675	219,075	244,475
41/64	16,272	41,672	67,072	92,472	117,872	143,272	168,672	194,072	219,472	244,872
21/32	16,669	42,069	67,469	92,869	118,269	143,669	169,069	194,469	219,869	245,269
43/64	17,066	42,466	67,866	93,266	118,666	144,066	169,466	194,866	220,266	245,666
11/16	17,462	42,862	68,262	93,662	119,062	144,462	169,862	195,262	220,662	246,062
45/64	17,859	43,259	68,659	94,059	119,459	144,859	170,259	195,659	221,059	246,459
23/32	18,256	43,656	69,056	94,456	119,856	145,256	170,656	196,056	221,456	246,856
47/64	18,653	44,053	69,453	94,853	120,253	145,653	171,053	196,453	221,853	247,253
3/4	19,05	44,450	69,850	95,250	120,650	146,050	171,450	196,850	222,250	247,650
49/64	19,447	44,847	70,247	95,647	121,047	146,447	171,847	197,247	222,647	248,047
25/32	19,844	45,244	70,644	96,044	121,444	146,844	172,244	197,644	223,044	248,444
51/64	20,241	45,641	71,041	96,441	121,841	147,241	172,641	198,041	223,441	248,841
13/16	20,638	46,038	71,438	96,838	122,238	147,638	173,038	198,438	223,838	249,238
53/64	21,034	46,434	71,834	97,234	122,634	148,034	173,434	198,834	224,234	249,634
27/32	21,431	46,831	72,231	97,631	123,031	148,431	173,831	199,231	224,631	250,031
55/64	21,828	47,228	72,628	98,028	123,428	148,828	174,228	199,628	225,028	250,428
7/8	22,225	47,625	73,025	98,425	123,825	149,225	174,625	200,025	225,425	250,825
57/64	22,622	48,022	73,422	98,822	124,222	149,622	175,022	200,422	225,822	251,222
29/32	23,019	48,419	73,819	99,219	124,619	150,019	175,419	200,819	226,219	251,619
59/64	23,416	48,816	74,216	99,616	125,016	150,416	175,816	201,216	226,616	252,016
15/16	23,812	49,212	74,612	100,012	125,412	150,812	176,212	201,612	227,012	252,412
61/64	24,209	49,609	75,009	100,409	125,809	151,209	176,609	202,009	227,409	252,809
31/32	24,606	50,006	75,406	100,806	126,206	151,606	177,006	202,406	227,806	253,206
63/64	25,003	50,403	75,803	101,203	126,603	152,003	177,403	202,803	228,203	253,603



# Tightening torque values for wheel nuts and screws of passenger cars

manufacturer	type	N-m	
Alfa Romeo	Alfa 145	83 - 103	
	Alfa 146	83 - 103	
	Alfa 147	83 - 103	
	Alfa 155	73 - 90	
	Alfa 156	98	
	Alfa 164	95 - 105	
	Alfa 166	86	
	Alfa 33	88 - 108	
	GTV	83 - 103	
	Spider	83 - 103	
	100	120	
	A2	120	
	A3	120	
	A4	120	
A5	120		
A6	120		
A8	120		
Audi 200	110		
Audi 80	110		
Audi Quattro	110		
Cabriolet	110		
Coupe	110		
S3	120		
S8	120		
T1	120		
1	120		
BMW	3	90 - 110	
	5	90 - 110	
	7(> 01)	140	
	M5	100	
	X3	140	
	X5	140	
	Z3	100 - 110	
	Z4	120	
	Chrysler	Caravan	129
		Jeep Grand Cherokee (97-01)	115 - 150
Jeep Wrangler (93-96)		102	
Jeep Wrangler (96-02)		109 - 150	
Jeep Cherokee (97-01)		115 - 150	
Neon (94-99)		109 - 150	
Neon (99-02)		115 - 155	
PT Cruiser		115 - 155	
Stratus		109 - 150	
Voyager (01-02)		110 - 135	
Voyager (87-90)		129	
Citroën		AX	90
	AX GTI	90	
	AX Sport	90	
	AX10	90	
	AX11	90	
	AX14	90	
	Berlingo	85	
	C15E	70	
	C25	180	
	C1	100	
	C2	80 - 100	
	C3	80 - 100	
	C4	80 - 100	
	C5	80 - 100	
	C6	80 - 100	
	C8	100	
	Dispatch	100	
	GT	90	
	Saxo	85	
	Xiantia	90	
	XM	90	
	Xsara	85	
	ZK	90	
Daewoo	Applause	88 - 118	
	Charade	89 - 118	
	Cuore	88 - 118	
	Esoeri	80	
	Grand Move	88 - 118	
	Hi-Jet	89 - 118	
	Korando	80 - 120	
	Lanos	80	
	Leganza	100	
	Matiz	90 - 110	
	Move	88 - 118	
	Musso	80 - 120	
	Nexia	80	
	Nubria	80	
	Simon	89 - 118	
	Sportrak	90 - 120	
	Tacuma	108	
Daewoo	Teros	88 - 118	
	YRV	88 - 118	
Fiat	Coupe	98	
	Croma	98	
	Ducato	160	
	Ducato Maxi	180	
	Scudo	100	
	Stilo	98	
	Talento	160	
	remaining models	86	
	Ulysee	100	
	Cougar	128	
Ford	Escort	100	

manufacturer	type	N-m	
Ford	Estate (95-00)	100	
	Explorer	135	
	Fiesta (90-93)	70 - 100	
	Fiesta (94-02)	85	
	Focus (98-02)	85	
	Galaxy (01-02)	170	
	KA	85	
	Maverick (01-02)	133	
	Mondeo (96-00)	85	
	Probe	88 - 117	
	Puma	85	
	Scorpio	85	
	Sierra	88 - 117	
	Transit (02)	200	
	Transit 100 (91-00)	75 - 95	
	Transit 130	155 - 180	
	Transit 150	155 - 180	
	Transit 80 (91-00)	75 - 95	
	all models	108 - 110	
	Honda	H1	120 - 140
		H200	120 - 140
	Hyundai	Pony (bis 90)	70 - 80
		S-Coupe (90-92)	88 - 108
Stellar		70 - 80	
remaining models		90 - 110	
S-Type		128	
Jaguar	XJ12	88 - 102	
	XJ6	65 - 85	
	XJ8	66 - 82	
	XJR	88 - 102	
	XJ-S	66 - 82	
	X-Type (01-02)	68 - 92	
	Besta	90 - 120	
	Carens	88 - 118	
	Clarius	88 - 118	
	Mentor	88 - 118	
Pride	88 - 118		
Sedona	88 - 108		
Sephia	88 - 118		
Sportage	88 - 108		
Lada	Niva	88 - 91	
	Riva	70 - 78	
Lancia	Samara	70 - 78	
	Dedra	98	
Lancia	Kappa	98	
	remaining models	86	
Land Rover	Defender	100 - 120	
	Discovery (> 98)	140	
	Discovery (< 98)	129	
	Freelander	115	
	Range Rover (> 94)	108	
	all models	103	
	121 (> 95)	85	
Mazda	323 (> 98)	90 - 117	
	626 (> 97)	80 - 115	
	Demio	87 - 117	
	E-Series	90 - 120	
	MPV (> 99)	89 - 117	
	MX-5 (> 98)	90 - 117	
	MX-6 (> 94)	89 - 117	
	Premacy	80 - 117	
	tribute	133	
	Xedos (> 94)	89 - 117	
Mazda	Xedos 9	88 - 127	
	510	160 - 180	
Mercedes	200GE	190	
	230GE	190	
	508D	160 - 180	
	814 DA	250	
Mercedes	CL (99-02)	150	
	MB 100D	140	
Mercedes	M	150	
	S (98-02)	150	
Mercedes	Sprinter (95-02)	180 +20	
	remaining models	110	
Mini	V-Klasse (95-02)	175	
	Mini Cooper	90 - 110	
Mini	Mini One	90 - 110	
	3000 GT (93-01)	120 - 140	
Mitsubishi	Carisma	98 - 117	
	Colt	98	
	Eclipse (96-02)	117 - 137	
	Galant (97-02)	98	
	L200	120 - 140	
	Lancer (96-02)	98	
	Shogun Pajero	100 - 120	
	Shogun Pmin	98	
	Space Runner (98-02)	98	
	Space Star	98 - 117	
	Space Wagon (98-02)	98	
	Nissan	Almera (02)	98 - 118
		Maxima (00-02)	98 - 118
		Micra (92-02)	98 - 117
		Patrol GR	118 - 147
Pick-Up		118 - 147	
Serena (96-02)		98 - 118	
Terrano II		118 - 147	
X-Trail		98 - 117	

manufacturer	type	N-m	
Opel	Agila	85	
	Frontera-B (99-02)	120	
Peugeot	remaining models	110	
	106	85	
	206	85	
	306	80	
	307	90	
	406	90	
	605	90	
	607	90	
	806	100	
	Boxer	160 - 180	
	Estate	85	
	Expert	100	
	Porsche	all models	130
		Clio	90
Renault	Clio Sport	105	
	Espace	100	
	Kangoo	90	
	Laguna	100	
	Master	155	
	Megane	90	
	R5	80	
	Salfrane	90	
	Scenics RX 4	105	
	Trafic (00-02)	142	
Rover	Twingo	90	
	25	110	
	45	110	
	75 Tourer	125	
	MG	110	
Saab	MG ZT-T	125	
	Mini Cooper	57	
Saab	9-3	110	
	9-5	120	
Saab	900 (93-98)	90 - 110	
	9000 (89-97)	105 - 125	
Seat	Alhambra	140	
	Arosa	110	
	Cordoba	110	
	Ibiza	110	
Seat	Inca	110	
	Leon	120	
Skoda	Toledo (99-02)	120	
	Fabia	120	
Skoda	Octavia	120	
	all models	78 - 98	
Subaru	Alto	70 - 110	
	Baleono	85	
	Grand Vitara	95	
	Ignis	85	
	Jimny	95	
	Liana	85	
	Super Carry (99-02)	85	
	Swift	80	
	Vitara	80 - 100	
	Wagon R	85	
Toyota	4 Runner	103	
	Avensis	103	
	Camry	103	
	Carina	103	
	Celica	103	
	Corolla	103	
	Hi-Ace Power Van (96-02)	102	
	Land Cruiser Amazon (98-02)	209	
	Land Cruiser Colorado	110	
	MR2	103	
Paseo	103		
Picnic	103		
Volkswagen	Prado (96-02)	110	
	Previa	103	
	RAV4	103	
	Supra	103	
	Yaris	103	
	Beetle	120	
	Caddy	110	
	Golf	110	
	LT (96-02)	180	
	Lupo	110	
Passat (96-02)	120		
Polo	110		
Sharan (01-02)	170		
Touareg	160		
Touran	120		
Transporter (96-02)	180		
Volvo	C70	110	
	S40	110	
	S60 (02)	140	
	S70	110	
	S80	140	
	V40 (98-02)	110	
	V70 (00-02)	140	
V70 (97-02)	110		

All information subject to change - please observe the manufacturer's specifications for alloy rims!



## Fastening torque values for wheel screws of commercial vehicles (LCV + HGV) having standard rims

manufacturer	thread	fastening torque bolt centring	(N•m) hub centring	Trilex
Auwärter	M20 x 1,5	350	450	
	M22 x 1,5	350	600	
Bedford	M22 x 1,5	510 - 580	550 - 600	
	7/8"-11 BSF	510 - 580	550 - 600	
DAF	M18 x 1,5		340 - 400	270 - 300
	M20 x 1,5	280 - 350	450 - 520	320 - 350
	M22 x 1,5		700	
DaimlerChrysler	M22 x 2	380 - 460		
	M14 x 1,5	170	170*	M16-200
	M18 x 1,5	250	250*	M18x2:300
	M20 x 1,5	300	300	M20x2:350
Faun	M22 x 1,5	450	600	
	M18 x 1,5	290 - 320		
	M20 x 1,5	370 - 400		
Iveco	M22 x 1,5	430 - 460		
	M18 x 1,5		335 - 410	
	M20 x 1,5		440 - 540	
EVO-Bus, Setra	M22 x 1,5	380 - 450	580 - 650	
	M18 x 1,5	300		
	M20 x 1,5	400		
MAN	M22 x 1,5		600	
	M18 x 1,5		390	
	M20 x 1,5		475	
	M22 x 1,5		575	
RVI	M22 x 1,5		450 - 550	
Scania	7/8"-11 BSF	450 - 550	540 - 660	
Steyr-Daimler-Puch	M20 x 1,5		450 - 500	
	M22 x 1,5		550 - 600	
Volvo	M20 x 1,5		520 - 580	
	M22 x 1,5		570 - 630	
	7/8"-14 UNF		640 - 700	
VW Transporter T2,T5	M14 x 1,5	180		
VW T4 bis 12/95	M14 x 1,5	160		
VW T4 ab 01/96	M14 x 1,5	180		
VW LT28, 31	M14 x 1,5	200		
VW LT35, 40, 45, 50 trailer	M18 x 1,5		320	
	M14 x 1,5	110 - 120		
	M18 x 1,5	270	320	
	M20 x 1,5	350	450	
	M22 x 1,5	450 - 500	630 - 650	
	M22 x 2	430		

\*) with spring ring and fl t strip nuts 10 N•m = 1 Kpm

All information subject to change - please observe the manufacturer's specifications for alloy rims!



**TIGHTENING TORQUE:** THE TIGHTENING TORQUE VALUES SPECIFIED BY THE WHEEL RIM MANUFACTURERS MUST BE OBSERVED.

**FASTENING SCREWS:** THE WHEEL NUTS MUST BE TIGHTENED CROSS-WISE.

**WHEEL ASSEMBLY:** THE HUBS AND WHEELS OF ALL MOTOR VEHICLES ARE PROTECTED AGAINST RUST WITH THE HELP OF A PRIMER COAT AND PRIMARILY PROVIDED WITH ONE TOP COAT. BASED ON EXPERIENCE, THESE COATS YIELD SOMEWHAT DURING THE FIRST FEW KILOMETRES OF DRIVING. EVEN SCREWS AND NUTS NEED SOME TIME IN ORDER TO SETTLE DOWN. HENCE, IT IS ESSENTIAL TO CHECK THE WHEEL NUTS FOR TIGHTNESS AND TO RETIGHTEN THEM AFTER TIGHTENING THEM WITH A TORQUE WRENCH AND AFTER DRIVING THE FIRST 50 KM.

# Tightening torques for normal and fine threads

thread M	NORMAL THREADS									
	pre-tensioning force (kN)					tightening torque (N·m)				
	quality class in accordance with DIN 267									
	4.6	5.6	8.8	10.9	12.9	4.6	5.6	8.8	10.9	12.9
M 4x0,70	1,29	1,71	3,9	5,7	6,7	1,02	1,37	3	4,4	5,1
M 5x0,80	2,1	2,79	6,4	9,3	10,9	2	2,7	5,9	8,7	10
M 6x1,00	2,96	3,94	9	13,2	15,4	3,5	4,6	10	15	18
M 8x1,25	5,42	7,23	16,5	24,2	28,5	8,4	11	25	36	43
M 10x1,50	8,64	11,5	26	38,5	45	17	22	49	72	84
M 12x1,75	12,6	16,8	38,5	56	66	29	39	85	125	145
M 14x2,00	17,3	23,1	53	77	90	46	62	135	200	235
M 16x2,00	23,8	31,7	72	106	124	71	95	210	310	365
M 18x2,50	28,9	38,6	91	129	151	97	130	300	430	500
M 20x2,50	37,2	49,6	117	166	194	138	184	425	610	710
M 22x2,50	46,5	62	146	208	243	186	250	580	830	970
M 24x3,00	53,6	71,4	168	239	280	235	315	730	1050	1220
M 27x3,00	70,6	94,1	221	315	370	350	470	1100	1550	1800
M 30x3,50	85,7	114,5	270	385	450	475	635	1450	2100	2450
M 33x3,50	107	142,5	335	480	560	645	865	2000	2800	3400
M 36x4,00	125,5	167,5	395	560	680	1080	1440	2600	3700	4300
M 39x4,00	151	201	475	670	790	1330	1780	3400	4800	5600

thread M	FINE THREADS					
	pre-tensioning force (kN)			tightening torque (N·m)		
	quality class in accordance with DIN 267					
	8.8	10.9	12.9	8.8	10.9	12.9
M 8 x 1,00	18,1	26,5	31	27	40	47
M 10 x 1,25	28,5	41,5	48,5	54	79	93
M 12 x 1,25	43	64	74	96	140	165
M 12 x 1,50	40,5	60	70	92	135	155
M 14 x 1,50	58	86	100	150	220	260
M 16 x 1,50	79	116	136	230	340	290
M 18 x 1,50	106	152	177	350	490	580
M 20 x 1,50	134	191	224	480	690	800
M 22 x 1,50	166	236	275	640	920	1070
M 24 x 2,00	189	270	315	810	1160	1350
M 27 x 2,00	245	350	410	1190	1700	2000
M 30 x 2,00	309	440	515	1610	2300	2690

**INFO:**

PRE-TENSIONING FORCES AND TIGHTENING TORQUES FOR SETSCREWS (HEADLESS SCREWS) MADE OF STEEL HAVING BOLT HEAD DIMENSIONS AS SPECIFIED IN DIN 912, 931, 933, 934 / ISO 4762, 4014, 4017, 4032 ...\*

THE VALUES GIVEN IN THE TABLE CONSIDER

- A) FRICTION COEFFICIENT  $\mu_{GES} = 0.14^*$
- B) UTILISATION OF THE MINIMUM YIELD STRENGTH = 90 %
- C) TORQUE WHILE TIGHTENING

(\* THE FRICTION COEFFICIENT VALUE,  $\mu_{GES} = 0.14$  IS GENERALLY ASSUMED FOR SCREWS AND NUTS IN COMMERCIALY AVAILABLE DESIGNS.)

\*ADDITIONAL LUBRICATION OF THE THREAD CHANGES THE FRICTION COEFFICIENT CONSIDERABLY AND LEADS TO UNCERTAIN PULLING CONDITIONS! CALCULATIONS HAVE BEEN MADE IN THE FOLLOWING EXAMPLE USING A FRICTION COEFFICIENT  $\mu_{GES} = 0.14$ . THERE ARE DIFFERENT VALUES OF FRICTION COEFFICIENT OR VARIATIONS DEPENDING ON THE PULLING METHOD AND TOOL DEPLOYED. ALL SPECIFICATIONS ARE TENTATIVE REFERENCE VALUES

## torque and conversion factors

	mN·m	cN·m	N·m	ozf·in	lbf·in	lbf·ft	gf·cm	kgf·cm (kp·cm)	kgf·m (kp·m)
mN·m	1	0,1	0,001	0,142	0,009	0,0007	10,2	0,01	0,0001
cN·m	10	1	0,01	1,416	0,088	0,007	102	0,102	0,001
N·m	1000	100	1	141,6	8,851	0,7376	10197	10,2	0,102
ozf·in	7,062	0,706	0,007	1	0,0625	0,005	72	0,072	0,0007
lbf·in	113	11,3	0,113	16	1	0,083	1152,1	1,152	0,0115
lbf·ft	1356	135,6	1,3558	192	12	1	13826	13,83	0,138
gf·cm	0,098	0,01	0,0001	0,014	0,0009	0,00007	1	0,001	0,00001
kgf·cm (kp·cm)	98,07	9,807	0,098	13,89	0,868	0,072	1000	1	0,01
kgf·m (kp·m)	9807	980,7	9,807	1389	86,8	7,233	100000	100	1

## example:

	mN·m	cN·m	N·m	ozf·in	lbf·in	lbf·ft	gf·cm	kgf·cm (kp·cm)	kgf·m (kp·m)
mN·m	1	0,1	0,001	0,142	0,009	0,0007	10,2	0,01	0,0001
cN·m	10	1	0,01	1,416	0,088	0,007	102	0,102	0,001
N·m	1000	100	1	141,6	8,851	<b>0,7376</b>	10197	10,2	0,102
ozf·in	7,062	0,706	0,007	1	0,0625	0,005	72	0,072	0,0007
lbf·in	113	11,3	0,113	16	1	0,083	1152,1	1,152	0,0115
lbf·ft	1356	135,6	1,3558	192	12	1	13826	13,83	0,138
gf·cm	0,098	0,01	0,0001	0,014	0,0009	0,00007	1	0,001	0,00001
kgf·cm (kp·cm)	98,07	9,807	0,098	13,89	0,868	0,072	1000	1	0,01
kgf·m (kp·m)	9807	980,7	9,807	1389	86,8	7,233	100000	100	1

**Conversion of 40 N·m to lbf·ft  $40 \text{ N·m} \times 0.7376 = 29.504 \text{ lbf·ft}$**



# DRILLING / TECHNICAL INFORMATION: GUIDELINES FOR DRILLING SPEEDS, FEED RATE AND COOLING

The table provides approximate values. According to drilling depth and thickness of the material, an increase or reduction in the cutting speed feed rate or cutting fluid could be recommended. The values for -v- and -s- indicated value apply to drilling depths until 5 x d (d = drilling diameter) In drilling depths over 5 x d until 8 x d then -v- and -s- should be reduced around 20% to 30%. In general in drilling depths over 5 x d the hole should be cleaned!

material grade	cooling	cutting rate of 0 m/min	s=feed rate n=speed	twist drill diameter D [mm]							
				1*	2	5	8	16	25	40	63
				feed rates s				[mm/U] and medium speed n [U/mi]			
non alloyed steel up to 500 N/m <sup>2</sup>	oil and water emulsion	30-40	s	hand	0,05	0,12	0,2	0,3	0,4	0,4	0,5
n			11100	5600	2200	1400	700	450	280	180	
non alloyed steel 500-700 N/m <sup>2</sup>		25-30	s	hand	0,05	0,12	0,2	0,3	0,4	0,4	0,5
n			8800	4400	1750	1100	550	350	220	140	
non alloyed steel above 700 N/m <sup>2</sup>	oil and water emulsion	20-25	s	hand	0,04	0,1	0,15	0,25	0,3	0,3	0,4
n			7200	3600	1400	900	445	285	180	114	
alloyed steel 700-900 N/m <sup>2</sup>		12-15	s	hand	0,03	0,08	0,12	0,2	0,25	0,32	0,36
n			4300	2150	860	540	270	170	110	68	
alloyed steel 900-1100 N/m <sup>2</sup>	cutting oil	8-15	s	hand	Hand	0,06	0,001	0,2	0,3	0,3	0,3
n			3650	1840	735	455	230	145	90	60	
alloyed steel above 1100 N/m <sup>2</sup>		5-8	s	hand	Hand	0,04	0,06	0,1	0,12	0,16	0,18
n			2100	1050	415	260	130	83	52	33	
rust steady, acid steady steels (highly Cr, Ni alloy)	cutting oil	5-10	s	hand	Hand	0,05	0,1	0,15	0,2	0,2	0,3
n			2400	1200	480	300	150	95	60	38	
high tensile steel (high Co, Cr, Mo, Ni, W alloy)		4-8	s	hand	0,02	0,06	0,09	0,15	0,2	0,24	0,27
n	1900		950	380	240	120	76	48	30		
sprung steel band (high Si alloy)	cutting oil	3-6	s	Hand	Hand	0,04	0,06	0,1	0,12	0,16	0,18
manganese steel (Mn 10%, C 05%)	without cooling the material must be heated to 300	2-5	n	Hand	Hand	0,05	0,08	0,1	0,15	0,2	0,2
cast steel up to GS-52	oil and water emulsion	20-25	s	Hand	0,03	0,9	0,14	0,24	0,3	0,38	0,43
n			7200	3600	1400	900	445	285	180	114	
cast steel above GS-52	oil and water emulsion	12-20	s	Hand	0,03	0,08	0,12	0,02	0,25	0,32	0,36
n			5100	2550	1020	640	320	200	130	80	
cast iron up to GG-26	pneumatic	18-25	s	Hand	0,06	0,16	0,24	0,4	0,5	0,6	0,7
n			6800	3400	1350	860	430	275	170	110	
cast iron above GG-26	pneumatic	5-15	s	Hand	0,05	0,14	0,2	0,35	0,45	0,5	0,6
n			3200	1600	635	400	200	130	80	50	
malleable cast iron (GTW/GTS)	pneumatic (oil and water emulsion)	18-25	s	Hand	0,07	0,12	0,2	0,4	0,5	0,6	0,6
n	6800	3400	1400	850	430	275	170	110			
refined opper	oil and water emulsion (pneumatic)	50-80	s	Hand	0,005	0,15	0,25	0,4	0,5	0,5	0,5
n	2100	10500	4100	2600	1300	830	520	330			
brass, tough (MS 63)	oil and water emulsion (cutting oil)	40-30	s	Hand	0,05	0,15	0,25	0,4	0,5	0,6	0,7
n	16000	8000	3200	2000	1000	640	400	250			
brass, alloy (MS 58) Bronze, soft (gun metal, Rg)	cutting oil	20-30	s	Hand	0,04	0,1	0,15	0,25	0,32	0,42	0,46
n			8000	4000	1600	1000	500	320	200	125	
bronze, hard (Bz; Aternabronze)	cutting oil	10-20	s	Hand	0,04	0,1	0,15	0,25	0,32	0,42	0,46
n			4800	2400	960	600	300	190	120	75	
copper nickel alloy (e.g. nickel bronze approx. 67% Ni)	cutting oil	5-15	s	Hand	0,02	0,06	0,09	0,15	0,2	0,24	0,27
n	3200	1600	635	400	200	130	80	50			
Aluminium	oil and water emulsion	50-120	n	Hand	0,02	0,06	0,09	0,15	0,2	0,24	0,27
n			3200	1600	635	400	200	130	80	50	
nickel alloy aluminium (e.g. piston alloy)	oil and water emulsion	20-44	s	Hand	0,04	0,1	0,15	0,25	0,32	0,4	0,45
n			9600	4800	1900	1200	600	380	240	150	

\* when the diameter is below 1 mm the cutting speed should be reduced.





# TRADE FAIRS AND EVENTS



KS Tools will be present at more than 30 national and international trade fairs and events throughout the year. Take the opportunity to get a first-hand look at our products and test them out.

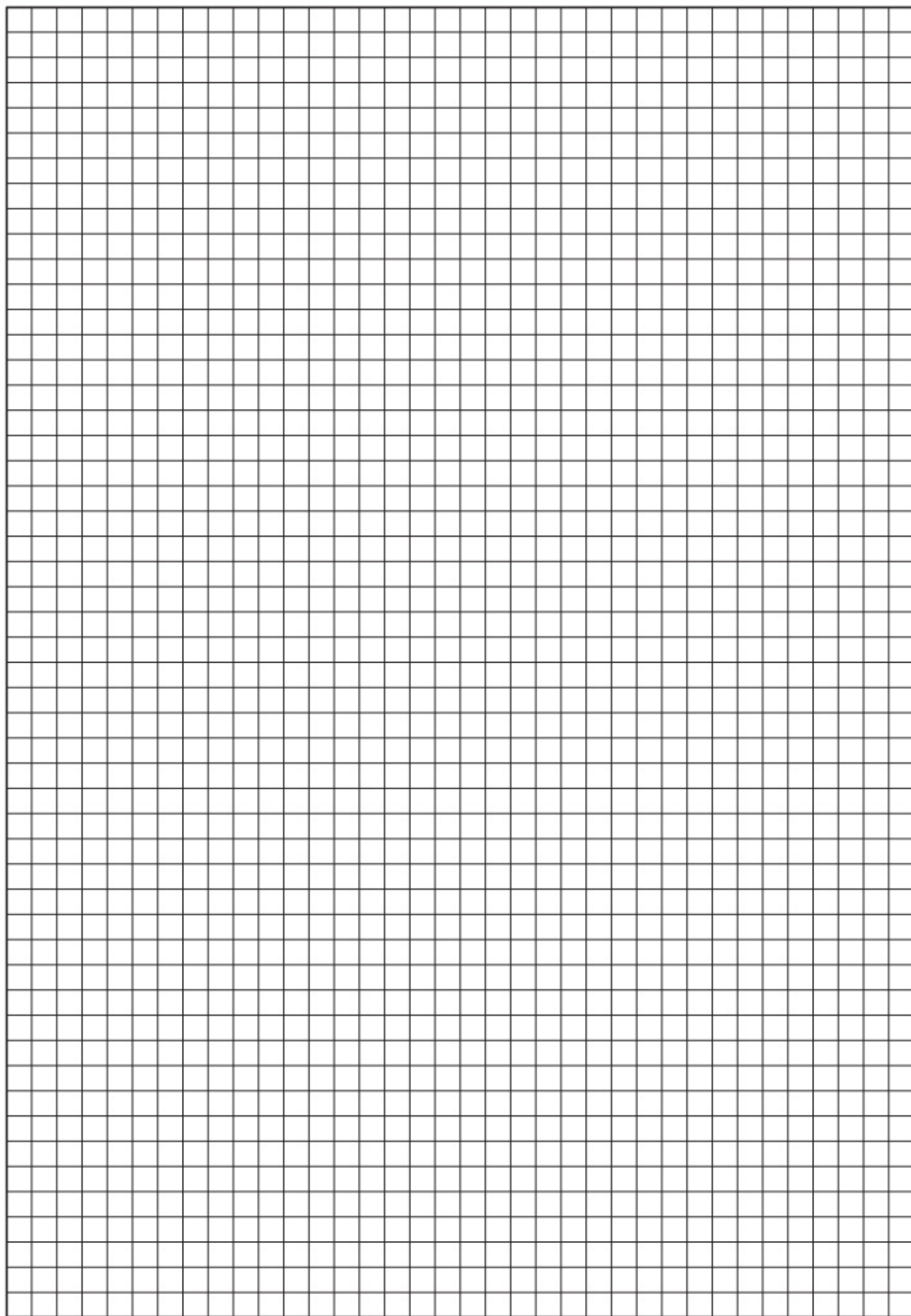
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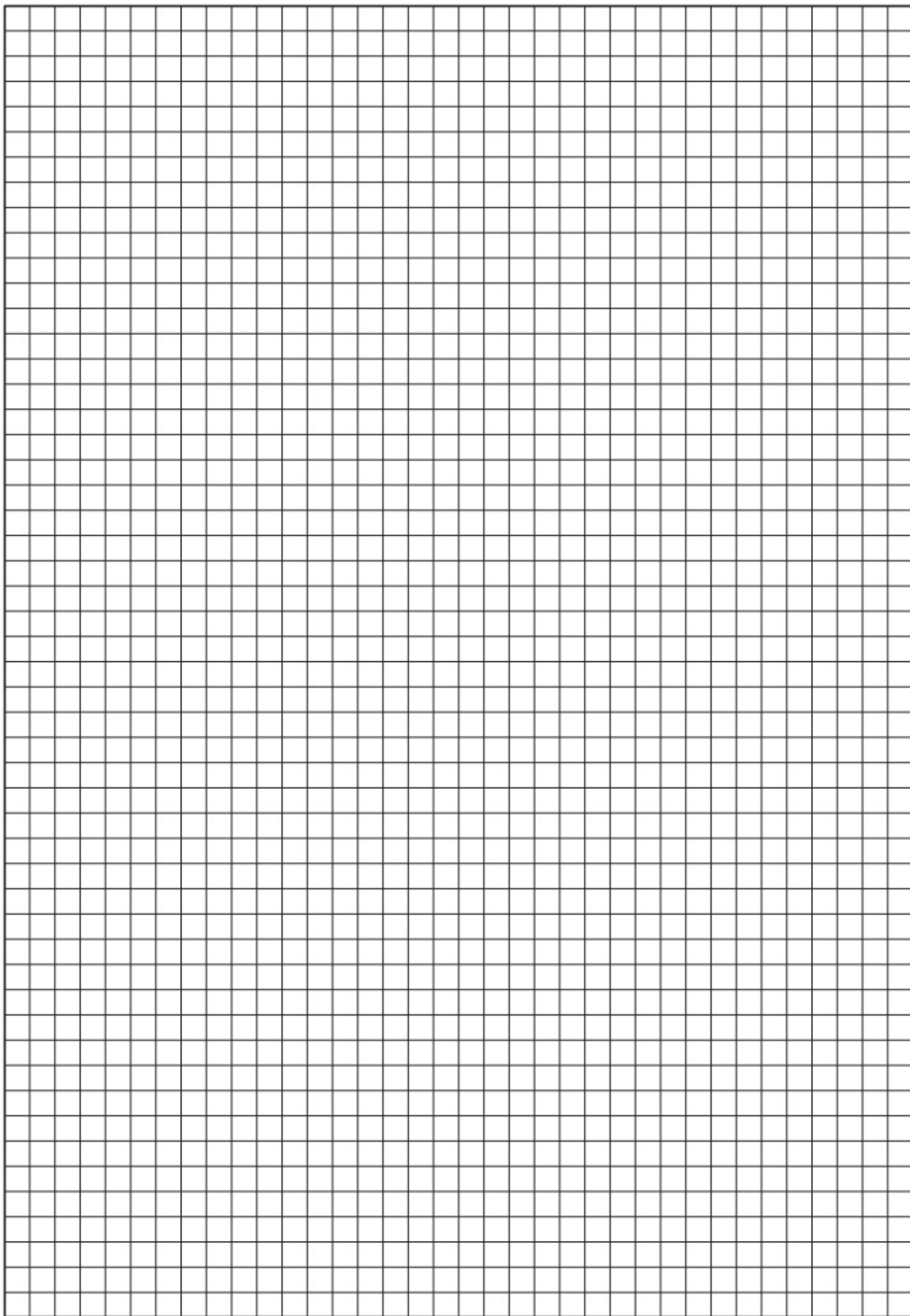
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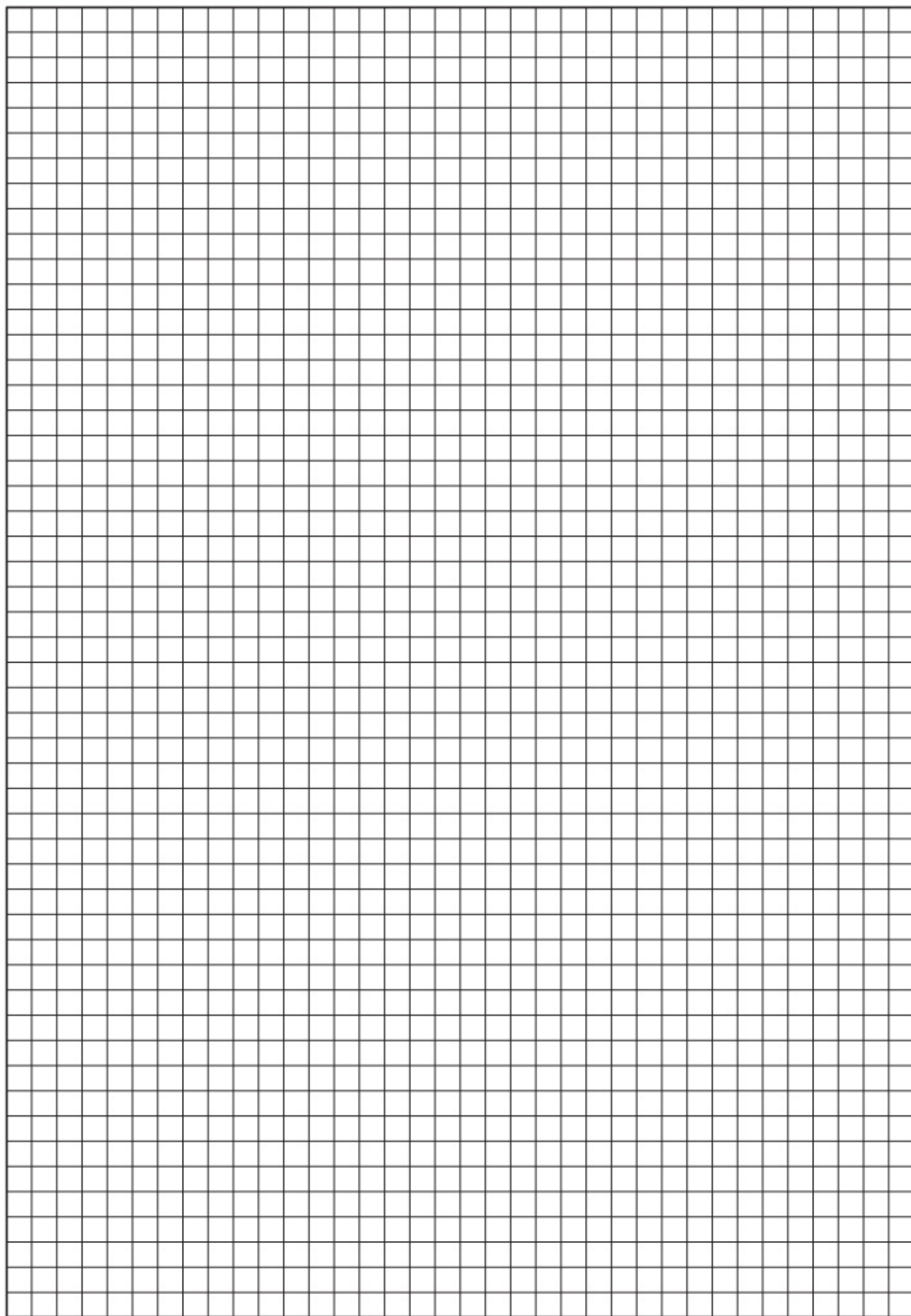
- WINKELMESSER  
PROTRACTOR
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- MESSSCHIEBER  
CALIPER
- RECHNER  
CALCULATOR
- SENKLOT  
PLUMB LINE
- DEZIBELMESSER  
DECIBEL METER
- TASCHENLAMPE  
FLASHLIGHT
- ONLINE-SHOP  
ONLINE-SHOP
- SCANNER  
SCANNER
- HÄNDLERSUCHE  
DEALER LOCATOR
- TOOLFINDER  
TOOLFINDER
- AKTIONEN  
PROMOTION
- CLIPFINDER  
CLIPFINDER
- INFORMATION  
INFORMATION
- TOOLCHANNEL  
TOOLCHANNEL



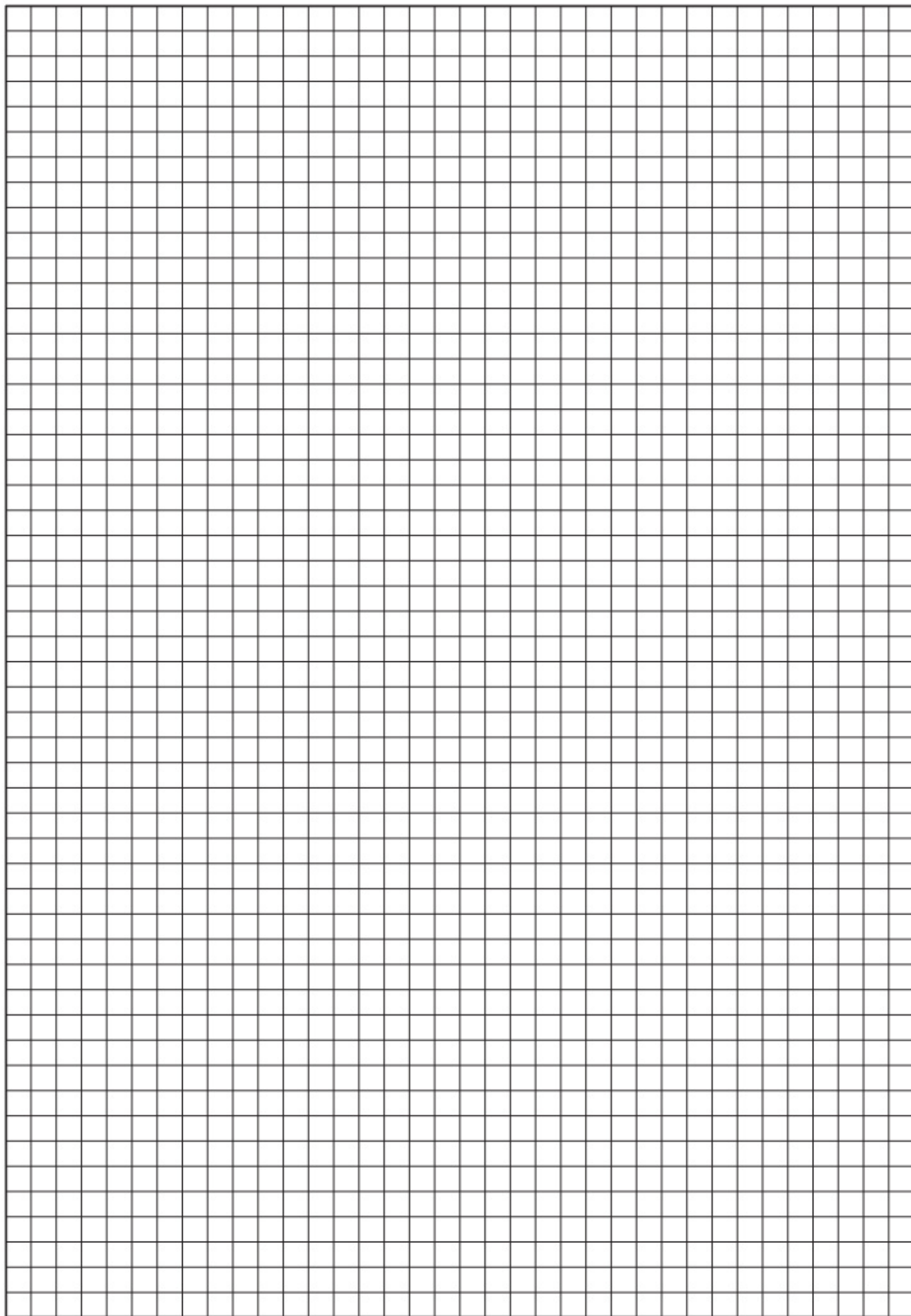


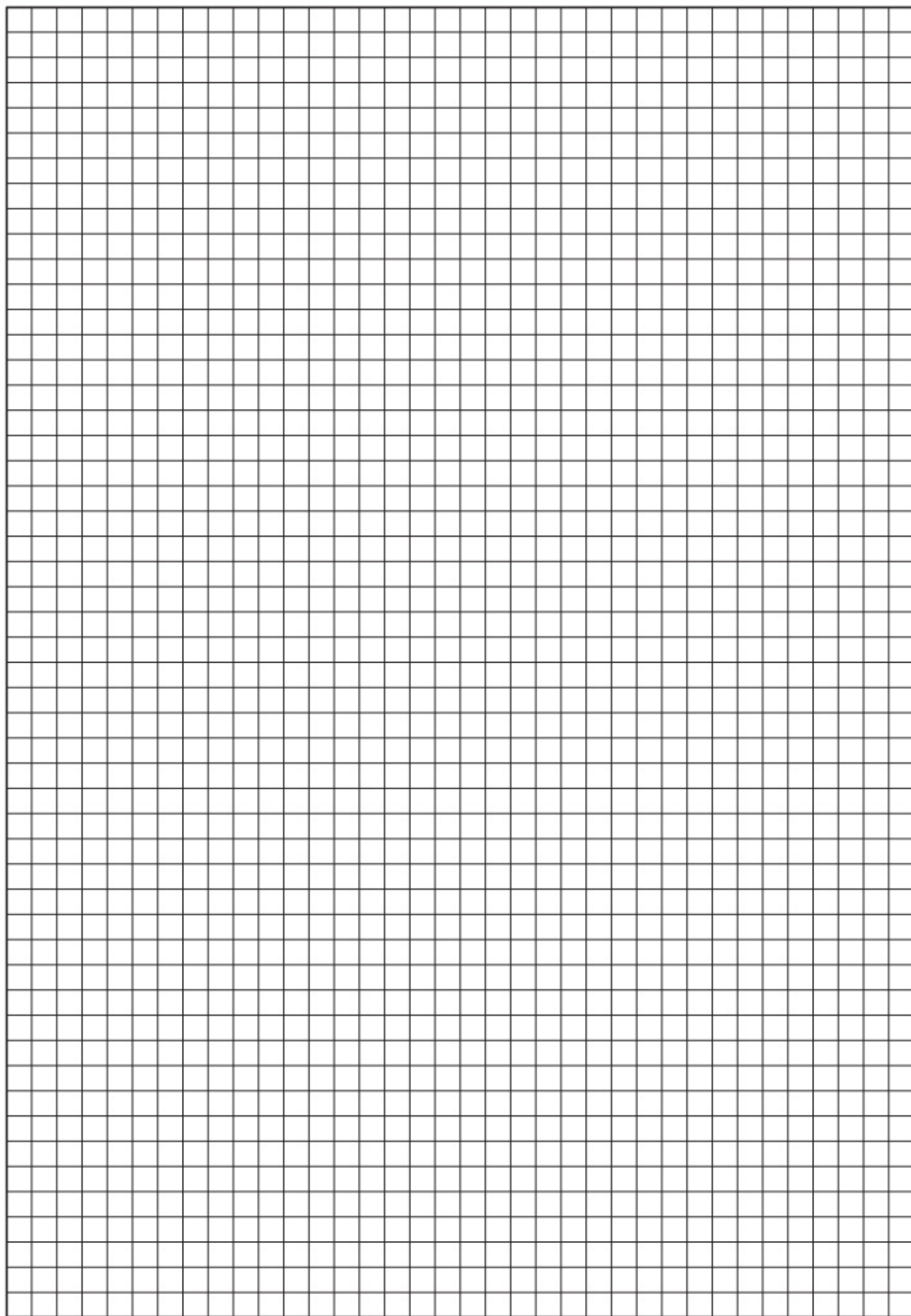




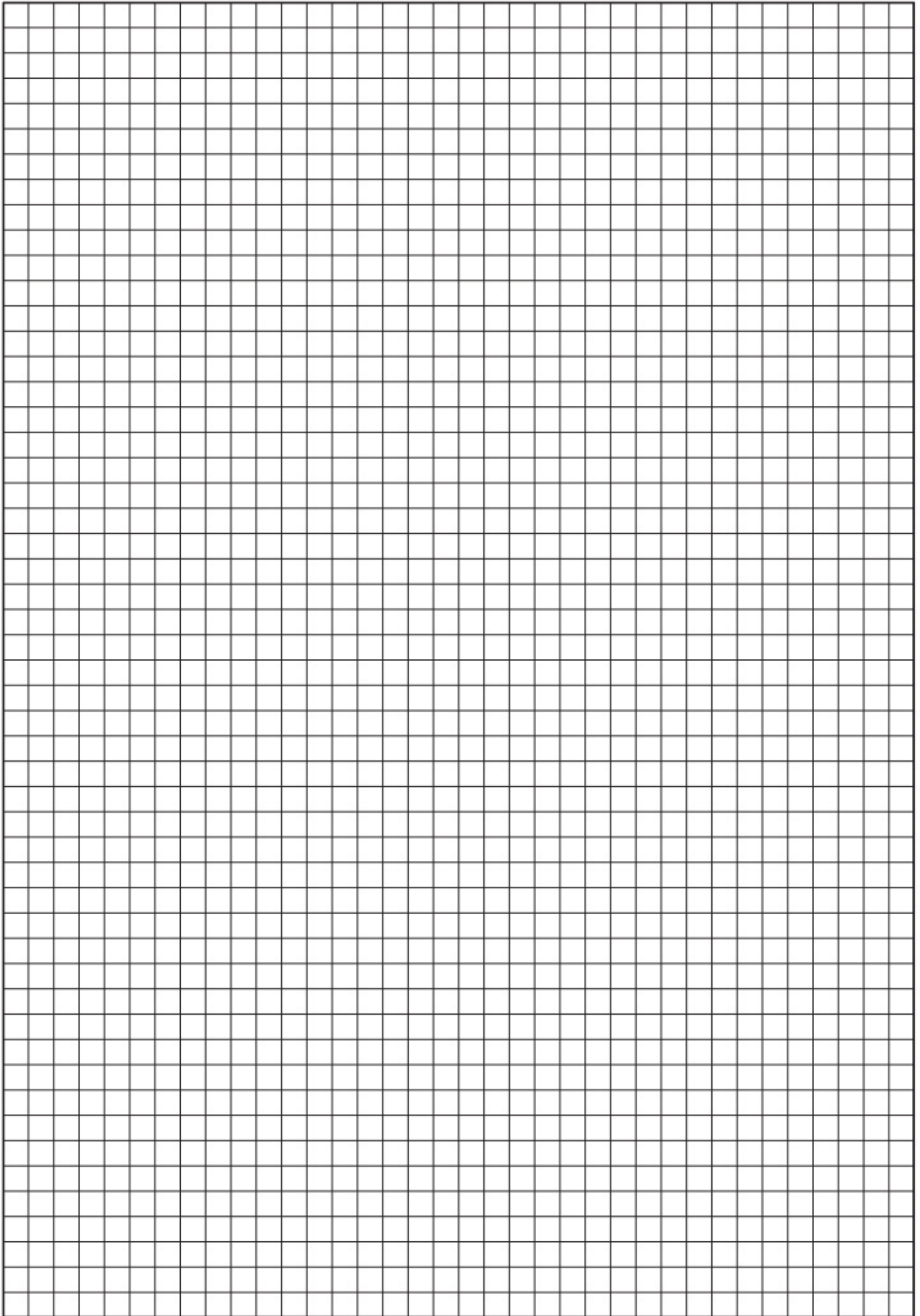














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1		<b>BODYWORK AND INTERIOR</b>
2		<b>ENGINE - ENGINE COOLING SYSTEM</b>
3		<b>ENGINE - HOSE CLAMP PLIERS</b>
4		<b>ENGINE - FUEL SYSTEM</b>
5		<b>ENGINE - CYLINDER HEAD / ENGINE BLOCK</b>
6		<b>ENGINE - TURBOCHARGER</b>
7		<b>ENGINE - FUEL INJECTION SYSTEM</b>
8		<b>ENGINE - SPARK PLUGS</b>
9		<b>ENGINE - GLOW PLUGS</b>
10		<b>ENGINE - AUXILIARY DRIVE BELT / ALTERNATOR</b>
11		<b>ENGINE TIMING TOOLS</b>
12		<b>EXHAUST SYSTEM / CATALYSERS</b>
13		<b>AIR CONDITIONING</b>
14		<b>BATTERY SERVICE</b>
15		<b>ELECTRICAL / ELECTRONIC TOOLS</b>
16		<b>HYBRID / HIGH-VOLTAGE TOOLS</b>
17		<b>GEARBOX</b>
18		<b>CLUTCH</b>
19		<b>SPRINGS / SHOCK ABSORBERS</b>
20		<b>STEERING AND STEERING GEOMETRY</b>
21		<b>AXLE</b>
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