

Metric Mechanic M20 Engine Series

2900 Sport, 3000 Sport/Rally, 3200 Sport, 3200 Rally

325i, 528, 525i ≥ '91

MM Engine	Displacement	HP	Cylinder Head	Cam Duration & Lift	Piston Weight	Pin Weight	CR	Rod Length & Weight	Crank Stroke
2900 Sport	2822 cc	205	HiFlo *ST Head 16% Flow Increase	Intake 286°/11.75mm Exhaust 276°/10.44 mm	86mm Sport Deep Pockets 2.9 Piston (330 grams)	22mm 89 grams	10.0:1	135mm 325i Rod 665 g or 135mm M3 Rod 565 g	81mm Cast
3000 Sport/Rally	2926 cc	225	HiFlo *ST Head 16% Flow Increase	Intake 286°/11.75mm Exhaust 276°/10.44 mm	86mm Sport Deep Pockets 3.2 Piston (310 grams)	22mm 89 grams	10.0:1	138mm H Beam 510 grams	84mm Forged
3200 Sport	3121 cc	230	HiFlo *ST Head 16% Flow Increase	Intake 286°/11.75mm Exhaust 276°/10.44 mm	86mm Sport Deep Pockets 3.2 Piston (310 grams)	22 mm 89 grams	10.0:1	135mm M3 Rod 565 grams	89.6mm Forged
3200 Rally	3121 cc	240	HiFlo *ST Head 16% Flow Increase	Intake 286°/11.75mm Exhaust 272°/11.75 mm	86mm Rally 3.2 Piston (260 grams)	21mm 80 grams	11.0:1	138mm I Beam 485 grams	89.6mm Forged

M20 Forced Induction Engine Series

2900 & 3100 Forced Induction

325i, 528, 525i ≥ '91

MM Engine	Displacement	HP	Cylinder Head	Cam Duration & Lift	Piston Weight	Pin Weight	CR	Rod Length & Weight	Crank Stroke
2900 Turbo	2858 cc	250 325	HiFlo *ST Head 14% Flow Increase	Intake 260°/10.45mm Exhaust 260°/10.45 mm	85mm Forged Alusil	21mm 105 grams	8.2:1	138mm "H" Beam Rods 525 Grams	84mm Forged
3100 Turbo	3049 cc	325 450	HiFlo *ST Head 14% Flow Increase	Intake 272°/11.75mm Exhaust 272°/11.75 mm	85mm Forged Alusil	21mm 105 grams	8.2:1	134.5mm "H" Beam Rods 500 Grams	89.6mm Forged

* ST means Surface Turbulence: Metric Mechanic Patented Machined Grooves on backside of the Intake Valves, Head of Intake and Exhaust Valves for the purpose of increasing fuel efficiency, minimizes tuning problems, reduces detonation in the motor, allows higher compression, and alleviates head cracking problems.

See Descriptive Text on next page

Metric Mechanic M20 Reliability Modifications:

ALL our **Normally Aspirated Sport, Sport/Rally & Rally Engines** include the following mechanical upgrades:

- 1) Modified Head Gasket to improve water flow to the back side of the 4th and 5th combustion chambers - to prevent head cracking.
- 2) Stronger 10mm socket Head Bolts for increased clamping load on the head gasket.
- 3) Rocker Arms that are 30% stronger and have been inspected. An absence of porosity favors extended rocker arm life.
- 4) Lightweight "Bee Hive" Valve Springs & Retainers to reduce Valve Train load.
- 5) Manganese Bronze Valve Guides for tighter valve stem - to guide clearance and extended guide life.
- 6) All Sport and Sport/Rally Engines have deep valve pockets to prevent the valves from contacting the piston in case of a timing belt failure. Note: To reduce flame travel distance from the spark plug to the piston top, this modification is not performed on our Rally Engine pistons. Routine Timing Belt changes should be made. We recommend Continental Belts changed every 45,000 miles.
- 7) Moly Top rings and 3 piece Oil Rings for good oil control & long life.
- 8) Rally & Sport/Rally Engines use Coated Tri-Metal Rod Bearings on standard rod journals to prevent rod bearing failure and for greater load carrying capacity.
- 9) All our M20 engines have 360° oiling groove main bearings to prevent oil starvation to the rod bearings at high RPMs.
- 10) Ported and Blue Printed Oil Pump. Ported at the discharge port and enlarged at the oil feed galley on the exit side of the oil pump for greater oil flow.
- 11) Horizontal Oil Baffle in the Oil Pan, to prevent oil starvation under hard cornering.
- 12) Optional Windage Tray/Scrapper Bar, Horizontal Baffle and Swing Gate to prevent oil starvation to the oil pump pick-up. These additional modifications, priced at \$750, are strongly recommended for track event participants.

ALL our **Forced Induction Engines** include all the modifications to the left and these additional mechanical upgrades:

- 1) Our special composite Head Gasket is used on engines running up to 15 lbs. Boost. For engines exceeding 15 lbs. boost, we use a Multi-Layered Head Gasket.
- 2) Our 85mm, 8.2:1, Forged Alusil, Forced Induction Pistons are designed specifically for boost and have the following features:
 - a. A stronger ceramic coated thermal barrier piston crown that is .080" or 2mm thicker than our normally aspirated pistons - for greater boost load.
 - b. Hard anodized pistons for 16# or greater.
 - c. The top ring is moved down on the piston for greater temperature and load protection.
 - d. Higher radial tension 4mm wide oil ring for better oil control.
 - e. Ventilated skirt design to reduce piston expansion.
- 3) "H" Beam Rods are used for higher load carrying capacity. The big end of these rods has four squirter grooves for shooting oil towards the bottom side of the piston to keep it cooled off and to lubricated the cylinder wall.
- 4) Heavy duty 105 gram wrist pins. Our normally aspirated piston uses 80 gram wrist pins.
- 5) Our High Volume Oil Pump with 25% larger gears than used in our normally aspirated engines. This allows for greater oil supply feeding to the Turbo Charger.