

#100 to #199 MORR 1600 Light Buggy Technical Specifications

DEFINITION

- A limited four-wheeled vehicle, using Volkswagen Type 1 stock components, with a 1585cc air-cooled engine.
- No parts may be replaced or modified unless stated in this document.
- Technical specifications for this class supersedes CCR.

CHASSIS

- Minimum wheelbase is 92".

FRONT SUSPENSION

- Must be Type 1 Volkswagen suspension only.
- Stock beam width must be 34-3/16".
- Front axle tubes may be cut, rotated, and re-welded to change the ground clearance, and may be reinforced by adding material.
- Link pin or ball joint front ends are allowed.
- The front spindles may be reinforced, but the diameter on the outside bearing must remain stock. The inside bearings may be enlarged. The speedometer hole may be welded and/or filled.
- Stock torsion bars must be used.
- Any order of narrow and wide stock torsion bars may be utilized.
- Front bump stop snubber removal is allowed.
- Limiters or limit straps are allowed.
- Stock arms must be used but may be reinforced using additional material.
- Torsion adjusters are not allowed.

REAR SUSPENSION

- Type 1 IRS or swing axle only.
- The torsion tubes, bars, and drive axles must be stock.
- Track width is 51" maximum, measured from backing plate to backing plate at ride height.
- IRS swing arms may be strengthened, as long as the stock measurements are kept. The stock dimensions are measured from the center of the rear torsion tube to the center of the rear stub axle and must measure 16.25".
- Rear torsion tubes may be strengthened, but must maintain the stock width of 40.5".
- A support member of the roll cage may additionally support rear torsion bar tubes.
- The trailing arm bumper may be removed. Rear spring plates must be stock. Rear torsion snubbers may be of any manufacture but must be of stock dimensions.
- Upper and lower spring plate stops on the rear torsion housing must remain intact.
- Spring plates may not be notched out around the stops.
- No type of secondary suspension is allowed.
- Rear torsion adjusters are not allowed.

SHOCKS

- Only one shock per wheel is allowed.
- Front shock towers may be re-welded and reinforced but cannot be replaced with other material. Stock appearance and dimensions must be maintained.
- Rear shock length and location is open.
- Air and/or coil over shocks are not allowed.
- Any type of reservoir shock, external by-pass tubes, or shocks larger than 3" is not allowed .
- Internal floating piston shocks are not considered reservoir shocks and are allowed.

STEERING

- Rack and pinion steering only is allowed.
- No power steering is allowed.
- Chromoly or any other metal material tie rods are allowed.
- Tie rods must be one piece only.
- Tie rod ends may be any ball and socket type .
- Stock tie rods may not be modified in any way.

BRAKES

- Any combination of pedal assembly, master cylinder, and clutch slave cylinder is allowed.
- Volkswagen Type 1 drum brake systems only.
- Brake drums must be OEM or OEM reproduction of one-piece steel design.
- Mechanical steering brakes are allowed.
- Hydraulic steering brakes are not allowed.
- Brake bias adjusters are allowed.
- The dust ring on brake drums may be machined off, but the outer face of the drum must be otherwise untouched.
- Drilling out 4-bolt brake drums for a 5-bolt pattern is allowed.
- Brakes must lock all four tires when tested.

WEIGHT

- Minimum weight is 1,550 pounds at race end with driver. Cleaning of the vehicle may be required.
- Ballasts are allowed, with 3/8" minimum bolt to secure ballast to the frame.

ROOF

- Must be of 0.075" aluminum or 16 gauge (.063") steel sheeting only.
- Opening in roof must have a heavy-duty hinge with a secure latching system.
- Positive latch system must be Sportsman Series approved.

BODY

- Unrestricted.

ENGINE CASE

- Any Type 1, 2, 3 or universal case.
- Align boring is allowed.
- Drilling and/or tapping for oil pressure and/or temperature sending units is allowed.
- Machined or push-in crank pulley seals are allowed.
- Case savers are allowed.
- Seating surfaces for the piston cylinders may be machined, but the cylinders must be shimmed back to original stock deck height of .039" or 1 mm minimum.
- Oil galleries on the early cases may be enlarged to 10mm to match the universal case.
- All oil gallery plugs may be removed and threaded.
- Oil by-pass piston and springs are unrestricted.
- Oil sump wind age trays are allowed.
- No other modifications are allowed.

CRANKSHAFT

- Must be stock Volkswagen Type 1, 1600cc (69mm stroke only).
- Power pulleys are allowed.

- Sand seals are allowed.
- May be undersized up to 0.030”.
- Balancing is allowed.
- Any brand bearings may be used as long as the stock dimensions are maintained.
- Crank lightening or the removal of any material other than for balancing is not allowed.
- Polishing, knifing and/or lighting of the counterweights is not allowed.

CONNECTING RODS

- Connecting rods must be Volkswagen #311 "B" rods only.
- 5.394” length plus or minus .010” measured C/L to C/L.
- Minimum weight must be 570 grams.
- Balancing of rods is allowed. When balancing, one small end and one large end must be left untouched.
- Bolts rather than the pressed studs and nuts will identify Volkswagen “A” rods.
- Polishing and profiling is not allowed .

OIL PUMPS

- Any manufacturer wet sump oil pump is allowed.
- Deep and/or dry sumps are not allowed.
- Any sump alterations or modifications are not allowed.

PISTONS & CYLINDER ASSEMBLY

- Any manufacturer, stock specification cylinders are allowed (85.5mm diameter maximum).
- Pistons must be cast. Forged pistons are not allowed.
- Three ring pistons only. Ring groove sizes are to be 2mm, and 5mm wide, above the piston pin.
- Rings must be correct to the groove size. No spacers are allowed.
- Wrist pin retainers may be of any type.
- Wrist pin size must be 22mm/0.687”.
- Pin height must be 1.5495” ± 0.002 ” from the top of the piston to the center of the hole.
- Pistons may be balanced to a minimum weight of 356 grams each (piston only).
- Machining the top of the piston is not allowed.
- Slipper skirts are not allowed.
- Gas ports are not allowed in skirts or ring grooves.
- Notched and/or domed pistons are not allowed.

CAMSHAFT & CAM GEAR

- Cam gear may be bolt-on type, and must use stock design gear.
- Cams must be to these specifications: (Lift is measured off push rod)
 - Intake:
 - Opens 16.5° BTDC, Closes 52.5° ABDC, Duration @.020 249°, Lobe Center 108°
 - Opens 1.5° ATDC, Closes 34.5° ABDC, Duration @.050 213°, Lobe Center 108°
 - Opens 17° ATDC, Closes 19° ABDC, Duration @.100 182°, Lobe Center 108°
 - CAM LIFT .303
 - Exhaust:
 - Opens 51.5° BBDC, Closes 15.5° ATDC, Duration @.020 247°, Lobe Center 108°
 - Opens 37° BBDC, Closes 1° ATDC, Duration @.050 218°, Lobe Center 108°
 - Opens 21.5° BBDC, Closes 14° BTDC, Duration @.100 187°, Lobe Center 108°
 - CAM LIFT .287

- New production cams that meet these specifications are available from Web Cam Inc. under the following part numbers:
 - P/N 00-782: New billet, Requires bolt-on gear, No core required
 - P/N 00-780: Reground stock cam, Core required

CYLINDER HEADS

- Must be U.S. sedan stock single port design.
- Fly cutting is allowed to clean seating surfaces, but must retain a 44cc combustion chamber.
- Only three angle valve seats (15-45-75 degrees).
- Grinding, polishing, or porting in any area of the head is not allowed.
- Back cutting of the valves is not allowed.
- Combustion chamber shape must not be altered or modified.

VALVES

- Valve sizes must be:
 - Intake: 35.5mm.
 - Exhaust: 32.0mm.
- Must be stock one or two-piece valve with stock profile.
- Only one 45 degree angle is allowed.
- Valve guide may be bronze, cast iron, or steel of any manufacturer and length.
- Any manufacturer of valve springs, spring retainers, and lifters is allowed. Stock dimensions inside and out must be retained.
- Grinding, polishing, and porting in any area of the head is not allowed.
- Back cutting of the valves is not allowed.
- Titanium (or other exotic material) valves are not allowed.
- Swirl polished valves are not allowed.

ROCKER ARMS & SHAFTS

- Any shaft that permits the use of stock Volkswagen Type 1, 1600cc 1.1:1 rocker arms is allowed.
- Stock Volkswagen Type 1, 1600cc rocker arms only.
- Resurfacing of rocker arms to accept swivel adjusters is allowed.
- Any manufacturer valve covers and gaskets are allowed.
- Any other grinding, resurfacing, or other modification is not allowed.
- Needle or roller bearings are not allowed .

INTAKE MANIFOLD

- Must be stock single port only.
- Heater tubes may be removed.
- No other modifications are allowed.
- Chemical milling is not allowed.

RESTRICTOR PLATES

- Restrictor plates are available at Sportsman Series tech trailer.
- Must use the 21.0mm Sportsman Series plate only.
- Must be the only piece between the carburetor and the intake manifold.
- No modifications to plate are allowed.
- Polishing, filing, or chemical milling is not allowed.

CARBURETOR

- Stock Volkswagen 30 PIC 1, 2, or 3 only.
- Solex H-30-PIC.
- EMPI 30 PICT-1 Stock Replacement Carburetor (P/N: 98-1288-B) is allowed.
- Maximum venturi size is 24.10mm.
- Removing automatic choke housing, choke plate, and shaft is allowed.
- Stock float bowl vent may be removed and plugged. An external float bowl vent is allowed.
- Stock fuel pump must be used.
- Any manufacturer air/fuel filter in any location is allowed.
- Any fuel pressure regulator may be used.
- Brosol PIC carburetor is allowed. Brosol logo must be on carburetor body. No modifications to throttle shaft, throttle plate, or venturi.
- Carburetor listed as PIC 30 is not allowed.
- Bonding or welding of velocity stacks to the carburetor is not allowed.
- Internal modifications, including polishing, filing, or chemical milling are not allowed.
- Removal of any parts from the throat area is not allowed.

ENGINE COATINGS

- Performance enhancing coatings may not be applied to engine components. This includes anodizing.
- Exhaust components may be coated.

EXHAUST HEADERS

- Unrestricted.

MUFFLERS

- Unrestricted.

IGNITION SYSTEMS

- A distributor must be used to send current to the spark plugs.
- Only one distributor is allowed.
- Battery ignition of 6 or 12 volts is allowed.
- Stock or direct replacement coil only.
- Stock or direct replacement distributor only.
- Any manufacturer distributor is allowed.
- Magnetic pickups that directly replace the points may be used.
- Any Volkswagen alternator or generator is allowed and must be mounted in the stock location.
- Alternator and cooling fan must use the Type 1 design and the charging system must be operational.
- Magneto, multiple coil, and direct fire ignition systems are not allowed.

ENGINE COOLING

- Fan shroud must be stock.

DRIVE TRAIN

- Only a stock diameter Volkswagen Type 1 design flywheel with four or eight dowels may be used.
- Lightening and balancing of the flywheel is allowed.
- Any gland nut and washer may be used on the flywheel.
- Any stock diameter clutch and pressure plate may be used.
- Clutches may be balanced
- Hydraulic clutch slave cylinders are allowed.

- An aluminum flywheel is not allowed.

TRANSMISSION

- Stock Volkswagen Type 1 Beetle only.
- Only IRS transmissions are allowed.
- Swingaxle transmissions are not allowed.
- Swingaxle specific gearsets are not allowed for use in IRS transmissions. For example:
 - 4.375 ratio ring and pinions are not allowed.
 - 1.32 ratio third gears are not allowed.
- AH or AT designation is allowed.
- AH-8:33 ring and pinion-4.125 ratio. Stock gears must be retained.
- AT-8:31 ring and pinion-3.875 ratio. Stock gears must be retained.

Transmission Ratios:

	AT	AH
First Gear	3.780	3.800
Second gear	2.059	2.059
Third gear	1.260	1.260
Fourth gear	0.930	0.890

- Gear ratios must be used with their original ring and pinion ratio, as shown in columns of the gearing chart above.
- Rear transaxle mounts may be additionally supported.
- Any manufacturer shifter is allowed.
- Beef-A-Diff is allowed.
- Differentials must meet the definition of an open differential, allowing 100% of power distribution between the rear wheels to be transferred to either rear wheel independently.
- Welding of 3rd gear is allowed.
- Any modifications except as listed above are not allowed.
- Heavy-duty side plates are not allowed.
- Axle over-tubes are not allowed.
- Close ratio gears are not allowed.

OIL COOLERS

- Any full-flow system is allowed.
- Coolers must be mounted in a safe location.

TIRES

- Tires must be D.O.T. approved as stated in the Combined Class Rules.

WHEELS

- Any stock Type 1 wheel or any manufactured 15" steel wheel may be used.
- Wheels may be reinforced by adding material.
- Studs may be used.

- Wheel adapters are not allowed.
- Bead locks are not allowed.

MUD FLAPS

- All buggy classes are exempt from using mud flaps.