



# **Four Stroke Karting**

**TILLOTSON TPP-225RS**

**Engine Technical Specifications**

**KNSW Version 1.0 – October 2023**

**Tillotson Australia Revision 2023071901**

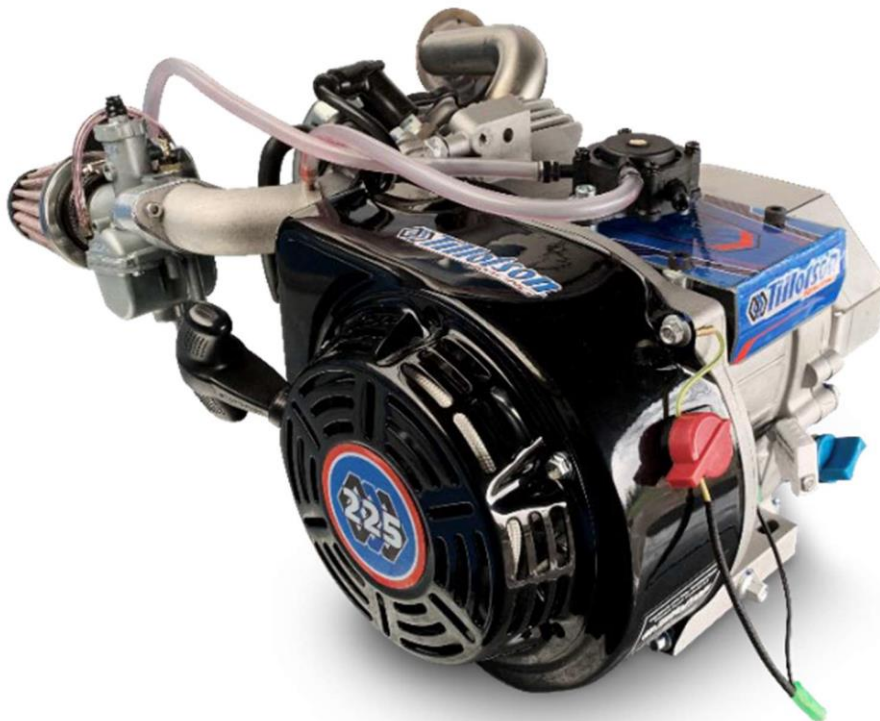


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# TPP-225RS Engine

## Australia Fiche & Rules 2023

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## **Section A: Engine**

### **1. Tillotson TPP-225RS Engine:**

- 1.1 The engine must remain as original from factory.
- 1.2 No after-market parts are permitted unless stated in TPP-225RS engine fiche document.
- 1.3 No machining or other modification of interior engine surfaces (deburring, honing, grinding, polishing, sanding, media blasting, heat treatment) is permitted.
- 1.4 All parts are subject to visual comparison and must remain in substantially unaltered form when compared to an original part.
- 1.5 Engine and all components must comply with engine fiche document.

### **2. Sealing:**

- 2.1 TPP-225RS engines must be fitted with the original engine ID Seal correlating with the engine ID number as supplied from the Tillotson factory. If an alternative seal number is identified the engine is not valid for competition.
- 2.2 Tillotson or their appointed agent are the only sealing agents permitted to open the engines and re-seal as necessary.
- 2.3 Sealing agent must notify Tillotson immediately after changes are made to any engine seal numbers.
- 2.4 Two seal types which are currently in use:

2021 onwards Production



2020 Production



- 2.5 Starting from Engine Serial Number 20110001 only the 2021 Production Engine seal is permitted. Any engine from this Serial Number using the previous model engine seal will not be allowed in competition.

### **3. Material Permitted to Manipulate:**

The following areas of adjustment and cleaning are permitted within reason. Any effect that alters the integrity of the components or which in the sole opinion of the scrutineer extends beyond reasonable cleaning is prohibited.

- 3.1 Valve clearances may be adjusted; however, valves must remain with the factory specification of 45-degree angle only. Valve seats of additional angles and/or angles not comparable to the factory stock of 30-45-60 degrees are not permitted.
- 3.2 Spark plugs may be cleaned to remove carbon.
- 3.3 Damaged thread repair: It is permitted to use Heli-coil or a similar thread repair insert as long as the part, after repair, is within the dimension, weight or measurements set on the engine fiche document.

#### 4. Engine Components:

- 4.1 Engine ignition switch and wires must remain in original location. It is not permitted to alter the wiring.
- 4.2 It is mandatory to use the original Air filter, P/N: T-AIRFILTER-01. No modification to the filter element is permitted.
- 4.3 A breathable rain sock or protective shield may be attached for wet-weather competition. It is not permitted for the protective shield to create any ram-air effect.
- 4.4 Oil breather valve cover: It is recommended to connect the oil breather pipe to a catch container. The container must be vented to the atmosphere.
- 4.5 Pulse signal from the engine must be taken from the inlet manifold to the fuel pump connection. The length of the pulse hose is recommended not to exceed 28cm.
- 4.6 Only original Fuel Pump is permitted. P/N: FP-10A
- 4.7 It is recommended to use the latest clutch guard as supplied (T-CLU-GRD-01). A minimum of two bolts must be used to mount the supplied chain guard.
- 4.8 A maximum of one in-line fuel filter is mandatory to ensure that dirt and contamination within the fuel system does not affect engine performance. We recommended the supplied FS-1P.
- 4.9 Blower housing / starter assembly must be original and properly installed. No taping, covering, or restricting of air of any part of this assembly is permitted.
- 4.10 No aftermarket kill switch may be allowed and the OEM kill switch must be as supplied by manufacture.

#### 5. Exhaust System:

- 5.1 The Exhaust System is mandatory as supplied by Tillotson with the engine.
- 5.2 Exhaust System comprises of the following three parts:
  - Header/Muffler - P/N: T-EXH-001
- 5.3 All parts must remain as originally supplied. No tuning, modification or manipulating of material is permitted.
- 5.4 Exhaust gasket must be original, one and only one piece may be used. Use of silicone is permitted.
- 5.5 Use of an O2, EGT or CO2 sensor is NOT permitted.
- 5.6 Exhaust protection is recommended. The Manifold should be completely wrapped with a non-asbestos insulation material or sleeve.
- 5.7 It is not grounds for disqualification if the exhaust nuts loosen during a race so long as the exhaust remains attached to the head with at least two nuts.
- 5.8 It is permitted to install one additional safety cable between the exhaust header and kart chassis case of exhaust dislodgement.

6. Clutch:
  - 6.1 The use of any 219 pitch clutch is permitted.
  - 6.2 The clutch must be original as supplied by the manufacturer and no modification or manipulating of material is permitted.
  - 6.3 It is strongly advised to mount the clutch is inboard to avoid added strain on the crankshaft.
  
7. Spark Plugs:
  - 7.1 The original spark plug supplied with the engine is recommended. The following spark plugs are permitted for use:
    - Autolite AR3910X
    - E3-106
    - Denso IW29
    - NGK SPARK PLUG BPR6ES-S
  
  - 7.2 Sealing washer must be in place and remain original on the stock spark plug used. Temperature thermocouple is permitted once the sealing washer is not modified.

***During technical inspections, a new stock part can be used as reference to compare a competitor's part for legality.***

## **Section B: Carburettor**

1. Tillotson FM22-1A Carburettor:
  - 1.1 The carburettor must remain as originally supplied from Tillotson.
  - 1.2 No after-market parts are permitted.
  - 1.3 No machining or other modification of the surface finish is permitted.
  - 1.4 Only the Tillotson supplied jets and slides are permitted for use.
  - 1.5 All parts are subject to visual comparison and must remain in substantially unaltered form when compared with an original part.
  - 1.6 Carburettor and all components must comply with carburettor fiche.

## **Section C: Oil**

- ~~1. The following oils are approved for use in the TTP-225RS Engine.~~
- ~~➤ Tillotson Racing Xeramic Oil- P/N: T-OIL-001~~
  - ~~➤ Penrite 10 Tenths, Racing 10, 10W-40: P/N: RACING10W40001~~
- ~~Tillotson Racing Xeramic Oil and Penrite 10 Tenths are the only oils permitted for use in the TPP-225RS engine.~~
- 1.1. Minimum volume of oil to be filled is 500ml. On technical inspection a minimum quantity of 450ml of Oil must be present in each engine if drained.
  - 1.2. No oil additives or foreign substances are permitted to use along with the oil.
  - 1.3. DYE testing of oil may be carried out during technical inspection on race day.
  - 1.4. Failure of the DYE test will result in exclusion and/or other penalties issued by the event organisers.



## APPENDIX 1

### TPP-225RS Parts List

#### 1.1 TPP-225RS ENGINE PACKAGES

<u>TILLOTSON P/N</u>	<u>DESCRIPTION</u>
TPP225RS-PKG-EUR	225RS COMPLETE VERSION
TPP225RS-SB2	225RS LONG BLOCK ENGINE (LESS FLYWHEEL, IGNITION AND ANCILLARIES)

#### 1.2 CRANKCASE & ACCESSORIES

<u>TILLOTSON P/N</u>	<u>DESCRIPTION</u>
138220002	CRANKCASE ASSEMBLY-S
138190002	BEARING, CRANKCASE-S
138220075	TOP MOUNTING PLATE ASSEMBLY
138220026	HEXAGON SOCKET HEAD CAP SCREW M6*20-S
138220025	SPACER-TOP MOUNTING PLATE
138190004	WASHER, DRAIN PLUG-S
138190005	BOLT, DRAIN PLUG-S
138190003	OIL SEAL-S
138220053	STICKER, TOP MOUNTING PLATE-S
138220082	NYLON SPACER
138220085	HOUR METER
138220083	HOUR METER SHIELD SLEEVING
138220084	HEAT SHRINKAGE SLEEVING

#### 1.3 CRANKSHAFT, CONNECTING ROD & PISTON

<u>TILLOTSON P/N</u>	<u>DESCRIPTION</u>
138210107	CRANKSHAFT ASSEMBLY-S
138220074	CONNECTING ROD ASSEMBLY FORGED
138220017	HALF-SLEEVE BEARING-S
138220016	BOLT, CONNECTING ROD-S
138220004	PISTON-S
138220006	PISTON PIN-S
138220008	CIRCLIP, PISTON PIN-S
138220005	RING SET, PISTON-S
138190007	PISTON, PIN, RING, CLIP ASSEMBLY

#### 1.4 CRANKCASE COVER, CLUTCH & CHAIN GUARDS

<u>TILLOTSON P/N</u>	<u>DESCRIPTION</u>
138190017	GASKET, CRANKCASE-S
138190016	DOWEL PIN BUSHING, CRANKCASE-S
138190002	BEARING, CRANKCASE-S
138190018	CRANKCASE COVER-S

138190020	DIPSTICK ASSEMBLY-S
138190019	OIL PLUG ASSEMBLY-S
138190003	OIL SEAL-S
138190015	FLANGE BOLT M8*30-S
138190060	FLANGE BOLT 5/16*20-S
T-CLU-GRD-01	CLUTCH GUARD 2021
WSCG022	GUARD, CLUTCH, WRAP AROUND, 3 HOLE MOUNT

### 1.5 CYLINDER HEAD & COMPONENTS

<u>TILLOTSON P/N</u>	<u>DESCRIPTION</u>
138190037	FLANGE BOLT M6*12-S
138190088	VALVE COVER-S
138190096	TUBE, BREATHER-S
138190038	GASKET, VALVE COVER-S
138190021	FLANGE BOLT M8*60-S
T-E3-106	SPARK PLUG, E3
138220013	NGK SPARK PLUG BPR6ES-S
138210100	CYLINDER HEAD ASSEMBLY-S
138190056	STUD, EXHAUST MANIFOLD-S
138220033	STUD, INTAKE MANIFOLD-S
138220030	CYLINDER HEAD GASKET-S
138190022	PIN, DOWEL, CYLINDER HEAD-S
138220014	FLANGE BOLT M6*16-S
138210125	AIR LEADING COVER-S
138220050	COMPLETE CYLINDER HEAD ASSEMBLY (INC VALVES, SPRINGS, RETAINERS)

### 1.6 VALVE TRAIN & CAMSHAFT ASSEMBLY

<u>TILLOTSON P/N</u>	<u>DESCRIPTION</u>
138190035	VALVE LOCKING NUT-S
138190034	VALVE ADJUSTING NUT-S
138190033	ROCKER ARM-S
138190030	ROCKER ARM SUPPORT-S
138190031	PLATE, PUSH ROD GUIDE-S
138190032	PUSH ROD-S
138190013	TAPPET, VALVE-S
138220012	CAMSHAFT ASSEMBLY-S
138210101	VALVE, INTAKE-S
138210102	VALVE, EXHAUST-S
138210112	VALVE SEAL-S
138220029	VALVE SPRING (26LBS)-S
138210103	RETAINER, VALVE SPRING-S
138210104	VALVE COLLET-S

### 1.7 CARBURETTOR, AIR FILTER, FUEL PUMP & ACCESSORIES

<u>TILLOTSON P/N</u>	<u>DESCRIPTION</u>
138190050	GASKET, INTAKE MANIFOLD-S
138220034-PLATE	INTAKE MANIFOLD ASSEMBLY WITH ADAPTER PLATE
138220073	SPRING WASHER, M6 INTAKE STUD



138220020	STYLE 1 HEXAGON NUT,M6 INTAKE STUD
FP-10A	FUEL PUMP
FM22-1A	CARBURETOR, FM22-1A
306222598	CARBURETOR MOUNTING BOLTS, M6 x 16mm
T-AIRFILTER-01	AIR FILTER-S
138190055	FUEL IINE CLIP-S
138190092	FUEL LINE PULSE CONNECTION
138190093	PULSE FUEL LINE PROTECTIVE SLEEVE-S
138220078	R TYPE FUEL LINE CLAMP 25MM
138220081	R TYPE FUEL LINE CLAMP 20MM
FS-1P	FUEL STRAINER PCK.

### 1.8 STARTER, RECOIL, FLYWHEEL & IGNITION COIL

<u>TILLOTSON P/N</u>	<u>DESCRIPTION</u>
138220024	FLYWHEEL ADAPTOR-2019
138220063	FLYWHEEL ADAPTOR-2020
138220022	HEXAGON SOCKET HEAD CAP SCREW M6*12-S
138220007	PVL IGNITION COIL, 6500rpm.-S
138220019	IGNITION COIL STOP WIRE-S
138220023	HEXAGON SOCKET HEAD CAP SCREW 3/16 *20-S
138220018	FLYWHEEL ASSEMBLY-S
138220040	STARTER PULLEY CUP(47mm)-S
138190042	NUT, M14-S
138220069	STARTER ASSY, PULL(black)-S
138190047	KILL SWITCH-S
138220061	BLOWER HOUSING ONLY (BLACK)
138220066	STARTER RECOIL ONLY (BLACK)
138190037	FLANGE BOLT M6*12-S
138220058	STARTER HANDLE

### 1.9 EXHAUST OPTIONS & COMPONENTS

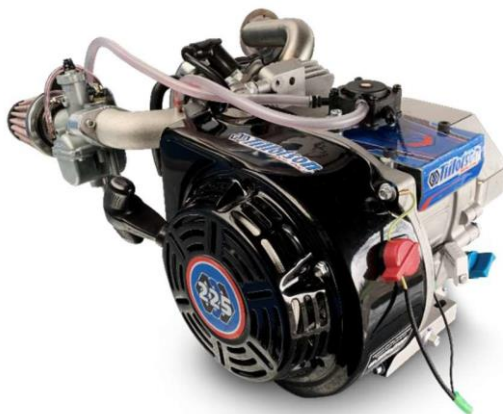
<u>TILLOTSON P/N</u>	<u>DESCRIPTION</u>
138190058	GASKET, EXHAUST-S
T-EXH-001	EXHAUST SILENCER-USA VERSION
138220021	SPRING WASHER GB 93-87 8-S
138190057	EXHAUST NUT-S
138220027	SPACER, SILENCER BRACKET-S
138220014	FLANGE BOLT M6*16-S
T-EXH-SIL-01	EXHAUST SILENCER-EUR VERSION
T-EXH-MAN-01	EXHAUST MANIFOLD
T-FLEX-01	EXHAUST FLEX
T-EXH-SPRING-01	EXHAUST SPRING
138220077	EXHAUST WRAP-S
138220055	HOSE CLAMP(21-38)-S
T-EXH-MANBKT-01	EXHUAUST MANIFOLD SUPPORT BRACKET ASSEMBLY

## APPENDIX 2

### Engine Fiche

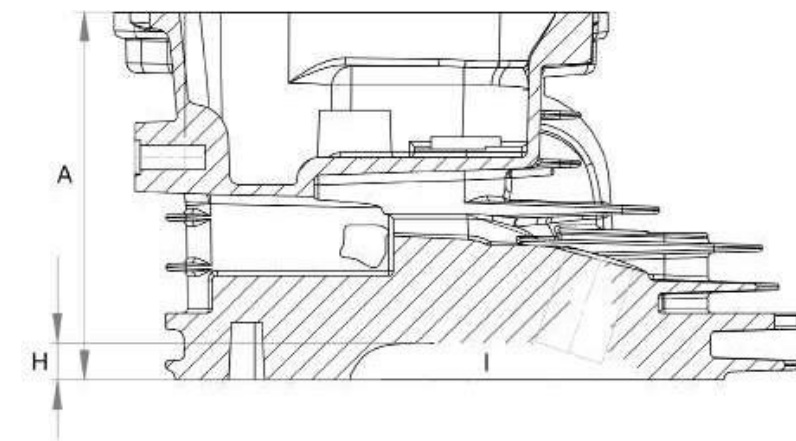
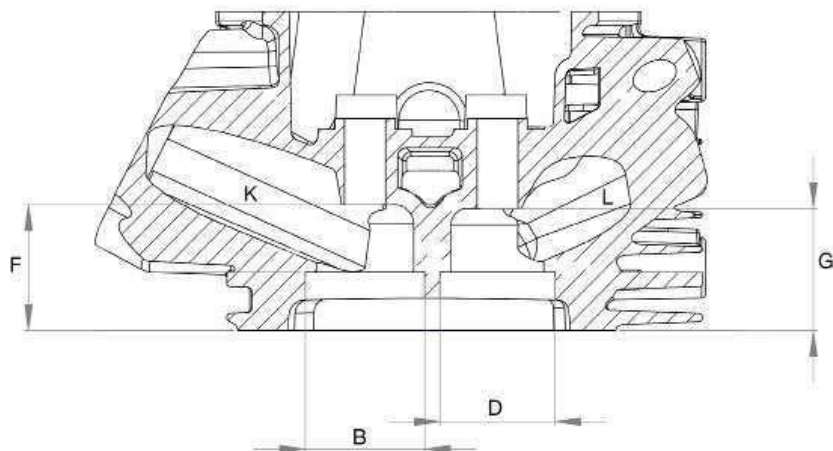


## Tillotson TPP-225RS Engine Fiche



Feature	Specification
Engine Type	2 Valve 4-Stroke
Fuel Type	Unleaded Petrol
Cylinder	Single/35° Heavy Reinforced Aluminum Block w/Cast Iron Sleeve
Cylinder Volume	225cc
Bore	72 mm/2.834 in maximum
Stroke	55 mm/2.165 in maximum
Piston - Deck Clearance	.4mm± .2 mm
Cooling System	Air
Carburetor	Tillotson FM22-1A
Cylinder Head	Aluminum Alloy 2-Valve Over Head Valve
Combustion Chamber Shape	26cc Factory Designed
Compression Ratio	9:1
Ignition Coil	PVL/Tillotson 4 Poles Digital Built in Limiter 6500RPMs
Flywheel	Digital Ignition Billet Aluminum 29° Advance Timing
Connecting Rod	Race Spec w/Bearing Inserts
Rod Length	88 mm/3.4646 in
Camshaft	Race Cam with Built in Compression Release
Engine Oil and Volume	Tillotson T4 Racing Oil, 500 ml ± 50 ml

Engines must conform to the technical data provided with no modification or machining allowed. Parts must be original as supplied by the manufacturer.


**Cylinder Head PN:138210100**

A. Overall Height	74.02 mm minimum
B. Intake Seat ID	24.75 mm +.1 mm
C. Intake Seat Angle	60-45-30
D. Exhaust Seat ID	22.6 mm +. 1 mm
E. Exhaust Seat Angle	60-45-30
F. Bowl Depth Intake	29.3 mm± .2 mm
G. Bowl Depth Exhaust	28.4 mm ± .2 mm
H. Combustion Chamber Depth	7.0 mm± .2 mm
I. Combustion Chamber Vol	19.4cc minimum
J. Valve Head Height from Gasket Surface	6.5 mm± .3 mm
K. Intake Port Volume	30cc maximum
L. Exhaust Port Volume	24cc maximum


**Cylinder Head Gasket PN:138220030**

Material	Composite
Thickness	1.26 mm ± .3 mm
Fire Ring	Steel

**Optional Head Gasket**

Material	Copper
Thickness	0.4 mm ± .1 mm


**Rocker Arm PN: 138190033**

Material	Steel
Ratio	1:1 max
Length	54.9 mm minimum
Tip Shape	Rectangular
Weight	16.5g ± .5g


**Guide Plate PN 138190031**

Material	Steel
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**Valve Lifter/Tappet** PN: 138190013

Material	Mild Steel
Overall Length	34.7 mm ± .2 mm
Stem Diameter	8 mm ± .2 mm
Head Diameter	23.6 mm ± .2 mm
Weight	19.5 g ± 1 g


**Valve Spring** PN 138220029

Material	Steel
Relaxed Height	26mm ± .2 mm
Wire Diameter	2.5 mm ± .2 mm
Overall O.D.	21.1mm ± .2 mm
Spring Force	26 lbs max @ .815 in (20.7mm) height


**Valve Spring Retainer & Lock**  
PN: 138210103

Material	Steel
Overall Height	7.9 mm min
Overall O.D	20.7 mm ± .2 mm
Retainer Weight	6.4 g min


**Push Rod** PN: 138190032

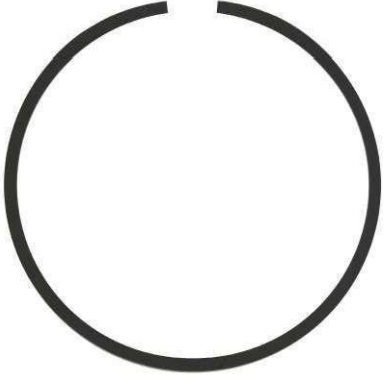
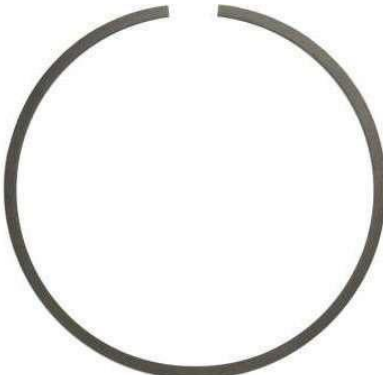
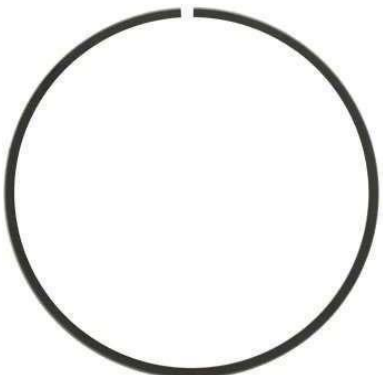

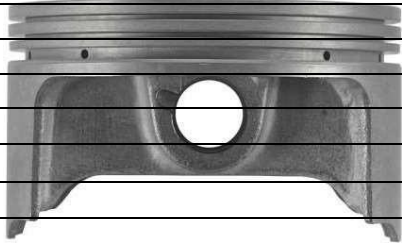

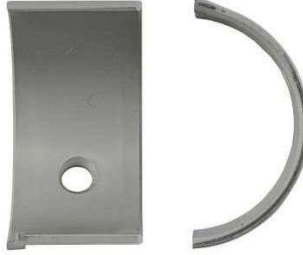
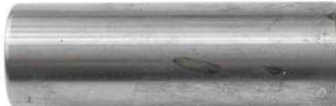
Material	Steel
Overall Length	134 mm ± .25 mm
Ball End Diameter	5 mm ± .2 mm
Rod Diameter	4 mm ± .2 mm
Weight	11 g ± .5 g


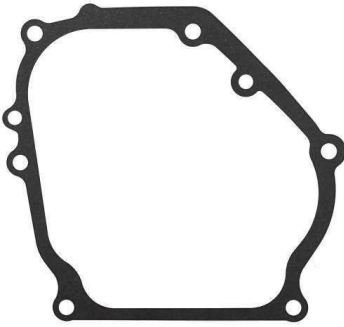




**Intake Valve** PN: 138210101

Material	Alloy Steel
Overall Length	63.8 mm min
Stem Diameter	4.8 mm min
Head Diameter	27 mm ± .2 mm
Valve Margin	2.3 mm ± 0.5 mm
Valve Angle	45°
Weight	21 g ± .25 g
Valve Marking	IN Z81 YF


**Exhaust Valve** PN 138210102

Material	Alloy Steel
Overall Length	63.8 mm min
Stem Diameter	4.8 mm min
Head Diameter	25 mm ± .2 mm
Valve Margin	2.3 mm ± 0.5 mm
Valve Angle	45°
Weight	19.5 g ± .5 g
Valve Marking	EX Z81 YF

																												
<p align="center"><b>Piston Top Ring PN:13822005</b></p> <table border="1"> <tr> <td>Material</td> <td>Steel</td> </tr> <tr> <td>Thickness</td> <td>1 mm± .05 mm</td> </tr> </table>	Material	Steel	Thickness	1 mm± .05 mm	<p align="center"><b>Piston Second Ring PN:13822005</b></p> <table border="1"> <tr> <td>Material</td> <td>Steel</td> </tr> <tr> <td>Thickness</td> <td>1 mm± .05mm</td> </tr> </table>	Material	Steel	Thickness	1 mm± .05mm	<p align="center"><b>Piston Oil Scraper Ring PN:13822005</b></p> <table border="1"> <tr> <td>Material</td> <td>Steel</td> </tr> <tr> <td>Thickness</td> <td>.40mm±.05mm</td> </tr> </table>	Material	Steel	Thickness	.40mm±.05mm														
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	<table border="1"> <tr> <td>Material</td> <td>Aluminum</td> </tr> <tr> <td>Diameter</td> <td>72 mm ± .15 mm</td> </tr> <tr> <td>Compression Height</td> <td>19.55 mm± .2 mm</td> </tr> <tr> <td>Wrist Pin Diameter</td> <td>13 mm± .1 mm</td> </tr> <tr> <td>Top Ring Landing</td> <td>2.5 mm ± .1 mm</td> </tr> <tr> <td>Second Ring Landing</td> <td>2 mm ± .1 mm</td> </tr> <tr> <td>Oil Ring Landing</td> <td>1.5 mm ± .1 mm</td> </tr> <tr> <td>Piston Top</td> <td>Flat</td> </tr> <tr> <td>Weight w/o Rings</td> <td>132 g ± .1 g</td> </tr> </table>	Material	Aluminum	Diameter	72 mm ± .15 mm	Compression Height	19.55 mm± .2 mm	Wrist Pin Diameter	13 mm± .1 mm	Top Ring Landing	2.5 mm ± .1 mm	Second Ring Landing	2 mm ± .1 mm	Oil Ring Landing	1.5 mm ± .1 mm	Piston Top	Flat	Weight w/o Rings	132 g ± .1 g	<p align="center"><b>Piston Oil Compression Ring PN:13822005</b></p> <table border="1"> <tr> <td>Material</td> <td>Steel</td> </tr> <tr> <td>Thickness</td> <td>1.72 mm± .05 mm</td> </tr> </table>	Material	Steel	Thickness	1.72 mm± .05 mm				
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Material	Steel																											
Thickness	1.72 mm± .05 mm																											
 <p align="center"><b>Connecting Rod PN:138220031</b></p>	 <p align="center"><b>Connecting Rod Bearing Insert PN 138220017</b></p>	 <p align="center"><b>Piston Wrist Pin PN:13822006</b></p>																										
<table border="1"> <tr> <td>Material</td> <td>Billet Aluminum 7075-T6</td> </tr> <tr> <td>Rod Length</td> <td>88 mm/3.4646 in ± .2 mm</td> </tr> <tr> <td>Width</td> <td>23.75 mm± .2 mm</td> </tr> <tr> <td>Weight with 122 g ± 2 g bolts</td> <td></td> </tr> </table>	Material	Billet Aluminum 7075-T6	Rod Length	88 mm/3.4646 in ± .2 mm	Width	23.75 mm± .2 mm	Weight with 122 g ± 2 g bolts		<table border="1"> <tr> <td>Material</td> <td>Babbitt</td> </tr> <tr> <td>Thickness</td> <td>1.5 mm - .2 mm for wear</td> </tr> <tr> <td>Width</td> <td>19.1 mm±.2 mm</td> </tr> <tr> <td>Weight (2 Pcs)</td> <td>19 g ± 1 g</td> </tr> </table>	Material	Babbitt	Thickness	1.5 mm - .2 mm for wear	Width	19.1 mm±.2 mm	Weight (2 Pcs)	19 g ± 1 g	<table border="1"> <tr> <td>Material</td> <td>Steel</td> </tr> <tr> <td>Overall Length</td> <td>40.3 mm± .1 mm</td> </tr> <tr> <td>Outside Diameter</td> <td>13mm±.1mm</td> </tr> <tr> <td>Inside Diameter</td> <td>9 mm ± .1 mm</td> </tr> <tr> <td>Weight</td> <td>22.5 g ± 2 g</td> </tr> </table>	Material	Steel	Overall Length	40.3 mm± .1 mm	Outside Diameter	13mm±.1mm	Inside Diameter	9 mm ± .1 mm	Weight	22.5 g ± 2 g
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Weight (2 Pcs)	19 g ± 1 g																											
Material	Steel																											
Overall Length	40.3 mm± .1 mm																											
Outside Diameter	13mm±.1mm																											
Inside Diameter	9 mm ± .1 mm																											
Weight	22.5 g ± 2 g																											



 <p><b>Crankcase Side Cover PN:138190018</b></p>		 <p><b>Crankcase Side Cover Gasket PN:138190017</b></p>		 <p><b>Crankcase Bearing PN:13819002</b></p>	
Material		Material		Material	
Cast Aluminum		Paper		Steel	
Bearing OD		Thickness		Ball Material	
52mm ± .2 mm		0.5 mm ± .15 mm		Steel	
Bearing ID		Color		Retainer Matera!	
25mm± .2 mm		Black		Steel	
Dowel Material				Bearing OD	
steel				52mm± .2mm	
				Bearing ID	
				25mm± .2 mm	
 <p><b>Crankshaft PN:138210107</b></p>				 <p><b>Crankcase Seal PN:13819003</b></p>	
Material				Material	
Forged Steel				Fluoropolymer - Red	
Crank Pin Diameter				Outside Diameter	
88mm- .3mm				41.25 mm± .2 mm	
PTO Shaft Diameter				Inside Diameter	
19.05 mm± .2 mm				23.6 mm ± .25 mm	
Weight					
1870g±10g					


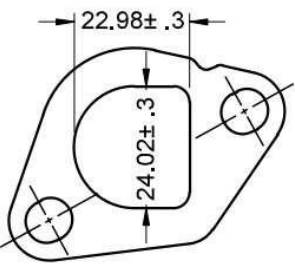
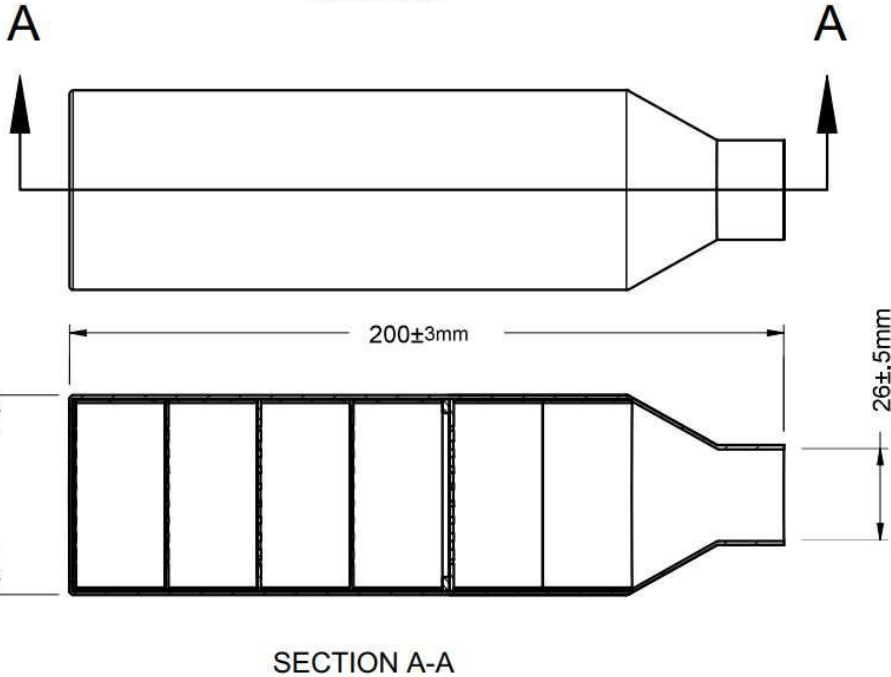
### Camshaft Specs PN:138220012



### Camshaft lift table

STANDARD VALUE					
EXHAUST			INTAKE		
Lift (mm)	Phase position (°)		Lift (mm)	Phase position (°)	
0.15	BBDC	83±4	0.15	BTDC	44 ±4
1.27	BBDC	51±4	1.27	BTDC	13±4
2.54	BBDC	32±4	2.54	ATDC	5.5±4
3.81	BBDC	14±4	3.81	ATDC	24±4
5.08	ABDC	6.5±4	5.08	ATDC	45±4
6.35	ABDC	38±5	6.35	ATDC	77±5
6.65-6.85	Max. lift		6.60-6.80	Max. lift	
6.35	BTDC	85.5±5	6.35	BBDC	47±5
5.08	BTDC	53±4	5.08	BBDC	15.5±4
3.81	BTDC	33±4	3.81	ABDC	5.5±4
2.54	BTDC	16±4	2.54	ABDC	27±4
1.27	ATDC	5±4	1.27	ABDC	42±4
0.15	ATDC	34±4	0.15	ABDC	70.5±4

<p><b>Ignition Coil</b></p>  <p>PN:138220007 / PN:138220095</p> <p>RPM Limit            6500-7500</p> <p>Brand                    PVL</p> <p>Type                     Digital</p>	<p><b>Reserved for future use</b></p>	 <p><b>Flywheel PN:138220018</b></p> <p>Material                Billet Aluminum</p> <p>Diameter                165mm ± .2mm</p> <p>Weight                  1.43 kg ± .05 kg</p> <p>Timing                  29°</p>
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<p>Exhaust Header/Muffler:    P/N: T-EXH-001</p> <p>Model:                            TILL4625</p> <p>Brand:                            NRV</p> <p>Qty. of Baffles:                5</p> <p>Dia. of holes in baffles:      3.17mm +/- 0.5mm</p>	
<p><b>EXHAUST FLANGE</b></p> 	<p><b>SILENCER</b></p>  <p><b>SECTION A-A</b></p>

## Recommended Torque Values

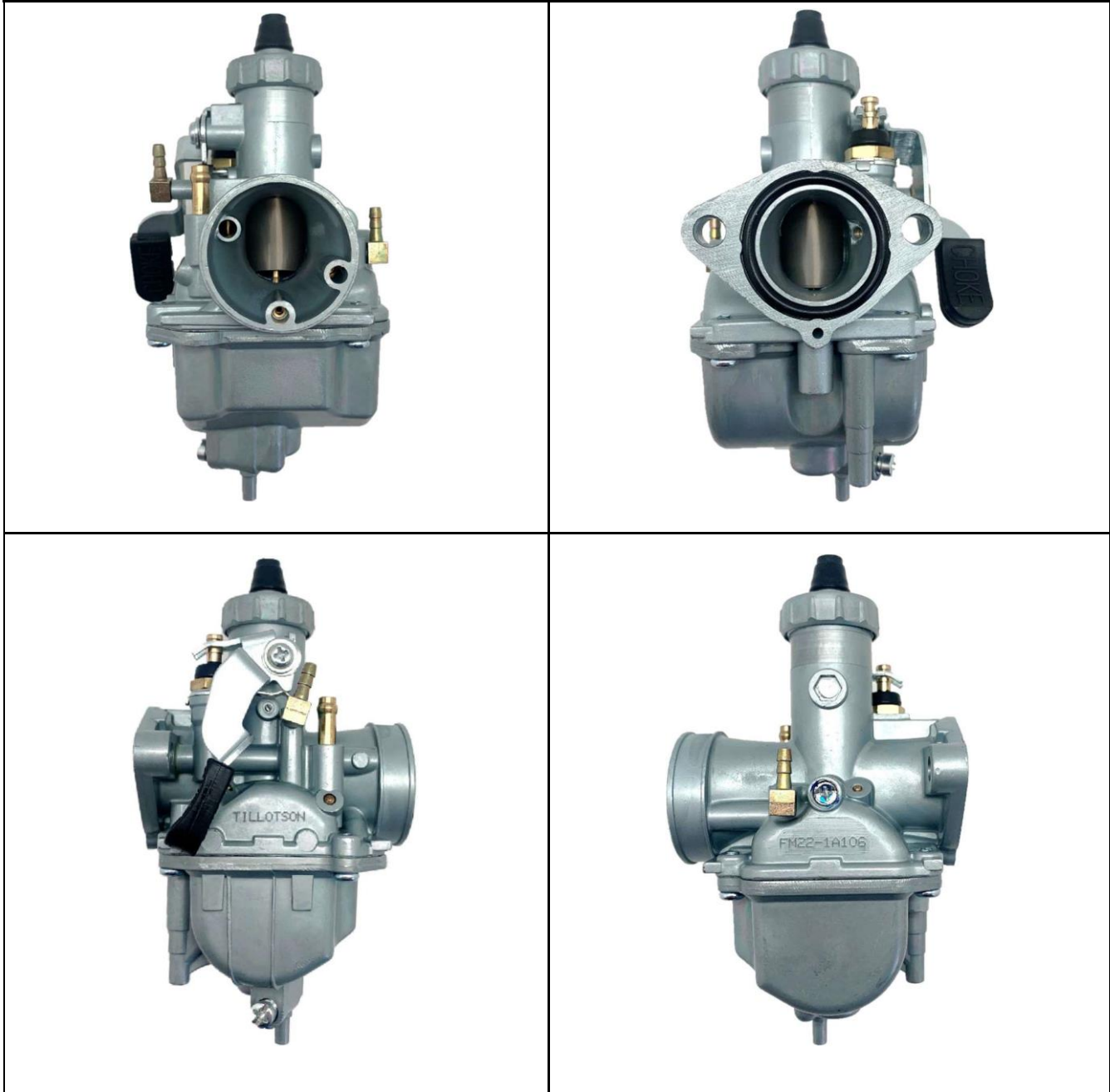
<u>Description</u>	<u>Socket Size</u>	<u>Torque (Nm)</u>
Cylinder Head	12mm	37Nm
Flywheel	21mm	70Nm
Rocker Arm Support	12mm	24Nm
Valve Locking Nut	10mm	10Nm
Spark Plug	21mm	24Nm
Crankcase Side Cover	10mm	33Nm
Blower Housing	8mm	10Nm
Carburetor to Manifold	10mm	10Nm
Connecting Rod	10mm	19Nm
Exhaust to Engine	13mm	28Nm
Intake Manifold to Engine	10mm	10Nm
Oil Drain Plug	10mm	22Nm
Valve Cover	8mm	7Nm



**APPENDIX 3**  
**Carburetor Fiche**



**CARBURETOR**  
**Tillotson FM22-1A**



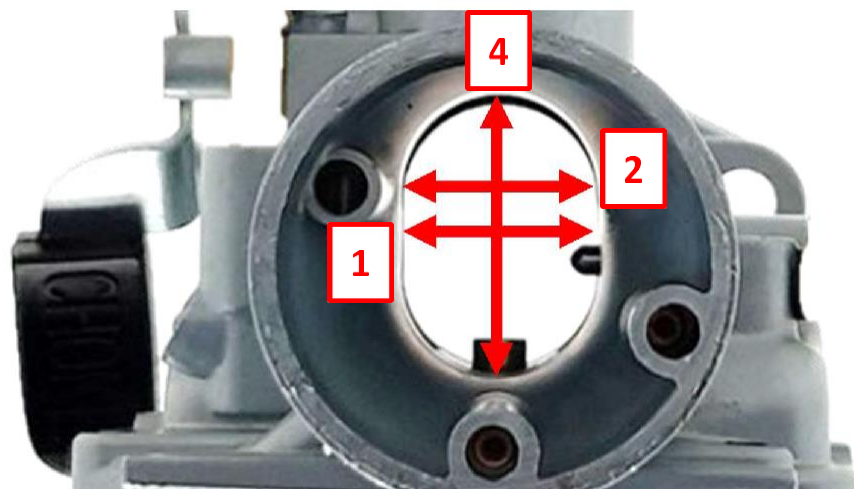
Manufacturer	<b>TILLOTSON LTD.</b>
Make	<b>TILLOTSON</b>
Model	<b>FM22-1A</b>

## Measurements & Tolerance Index

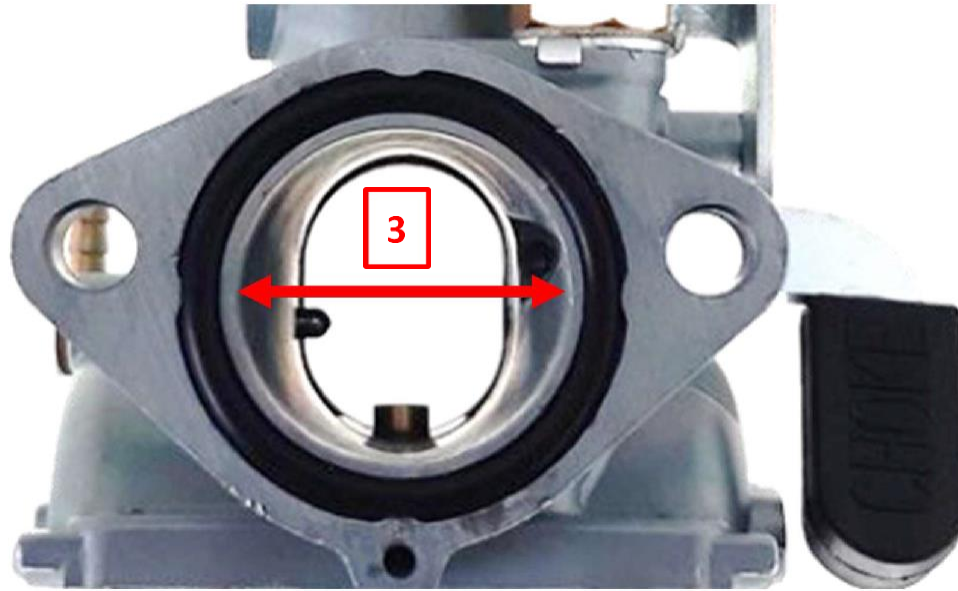
ITEM	DESCRIPTION	TOLERANCE
1	Venturi Horizontal Measurement Centre	18.22mm Max (0.717")
2	Venturi Horizontal Measurement Max	18.72mm Max (0.737")
3	Throttle Bore Diameter	26.25mm Max (1.034")
4	Venturi Vertical Measurement	25.05mm Max (0.986")
5	Air Pick Off Hole	1.9mm +/- 0.1mm (0.075" +/- 0.004")
6	Venturi Idle Air Hole	1.9mm +/- 0.1mm (0.075" +/- 0.004")
7	Fuel In	1.65mm Max (0.065")
8	Main Feed Hole	2.65mm Max (0.104")
9	Pilot Feed Hole	0.97mm +/- 0.06mm (0.038" +/- 0.002")
10	Idle Feed Hole	0.80mm +/- 0.05mm (0.32" +/- 0.002")
11	Choke Feed Hole	0.65mm Max (0.26")
12	Emulsion Tube & Main Jet Length	39.0mm +/- 0.15mm (1.536" +/- 0.007")
13	Main Jet Orifice	1.20mm +/- 0.04mm (0.046" +/- 0.0015")
14	Main Jet Emulsion Orifice x12	0.86mm Max (0.034")
15	Pilot Jet Length	29.05 +/- 0.15mm (1.144" +/- 0.007")
16	Pilot Jet Orifice	0.36mm +/- 0.04mm (0.014" +/- 0.0015")
17	Pilot Jet Emulsion x6	0.73mm Max (0.029")
18	Slide Length Max	37.00mm +/- 0.15mm (1.457" +/- 0.007")
19	Slide Diameter	20.4mm +/- 0.15mm (0.804" +/- 0.007")
20	Needle Length	50.0mm +/- 0.2mm (1.970 +/- 0.01")

## Measurement Diagrams

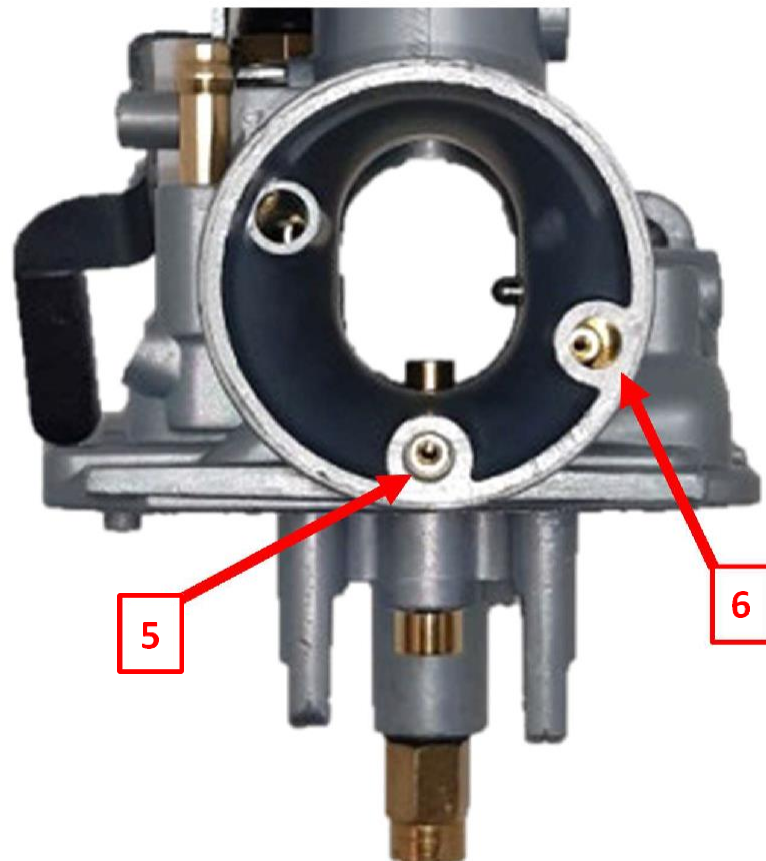
1. Venturi Horizontal Measurement Centre
2. Venturi Horizontal Measurement Max
4. Venturi Vertical Measurement



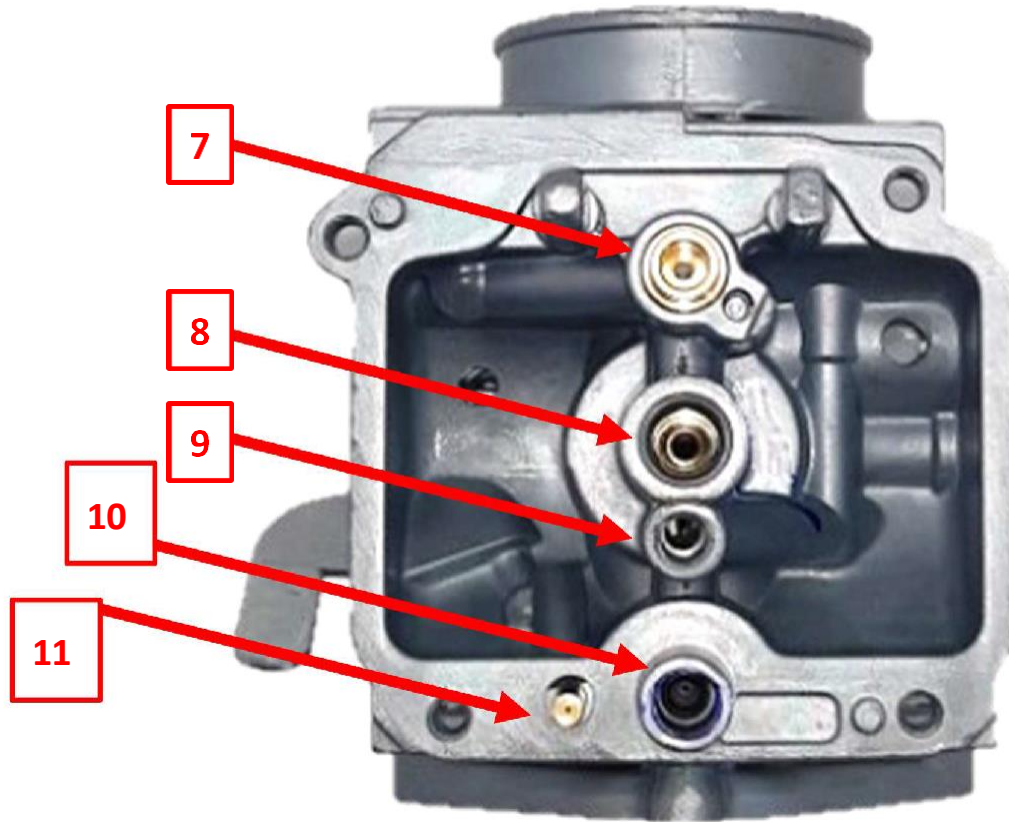
### 3. Throttle Bore Diameter



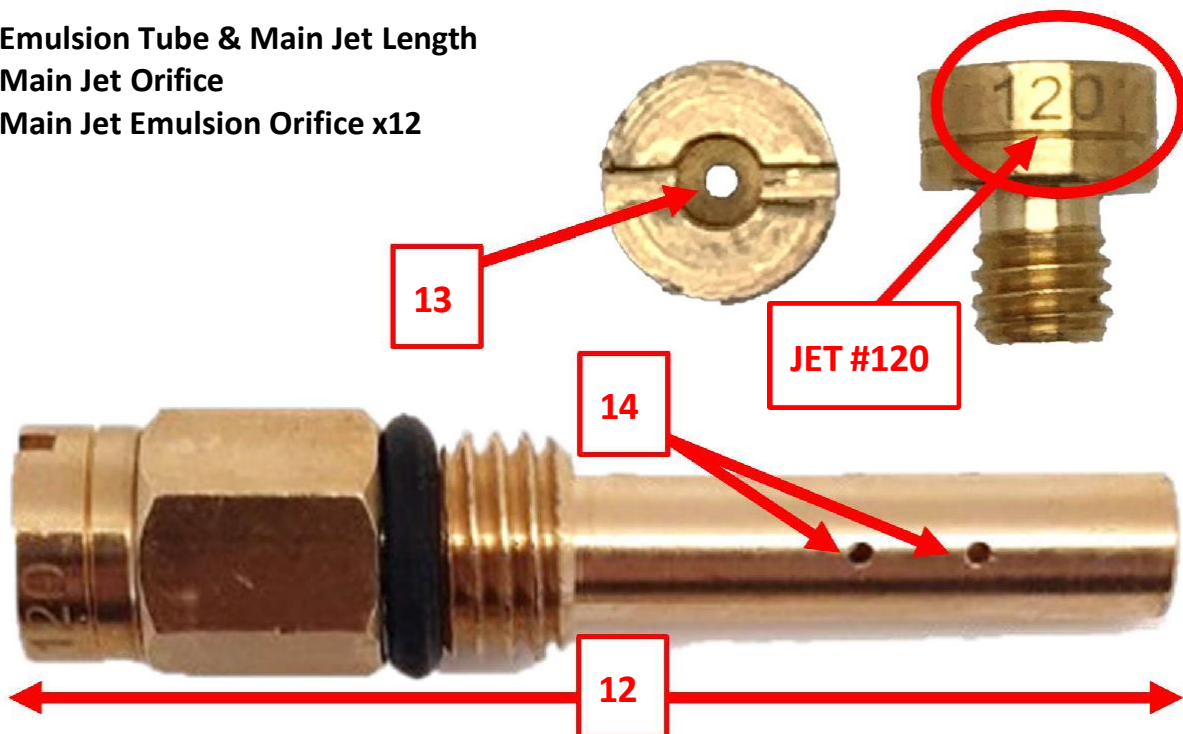
- 5. Air Pick Off Hole
- 6. Venturi Idle Air Hole



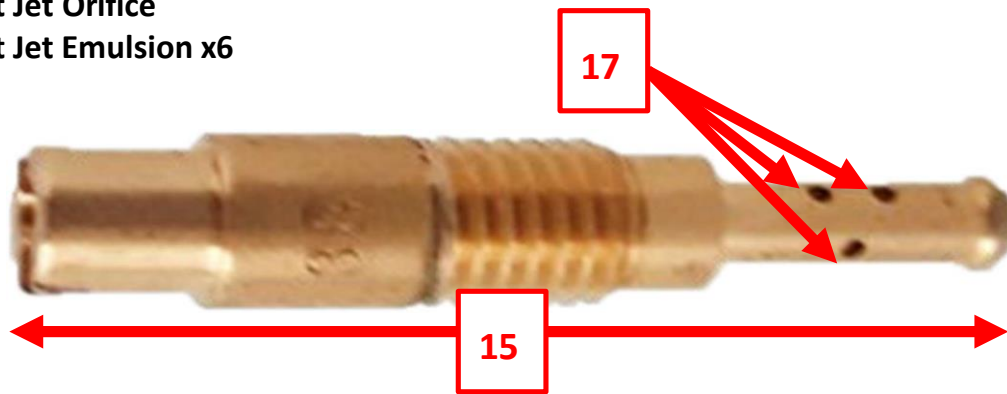
- 7. Fuel In
- 8. Main Feed Hole
- 9. Pilot Hole
- 10. Idle Hole
- 11. Choke Feed Hole



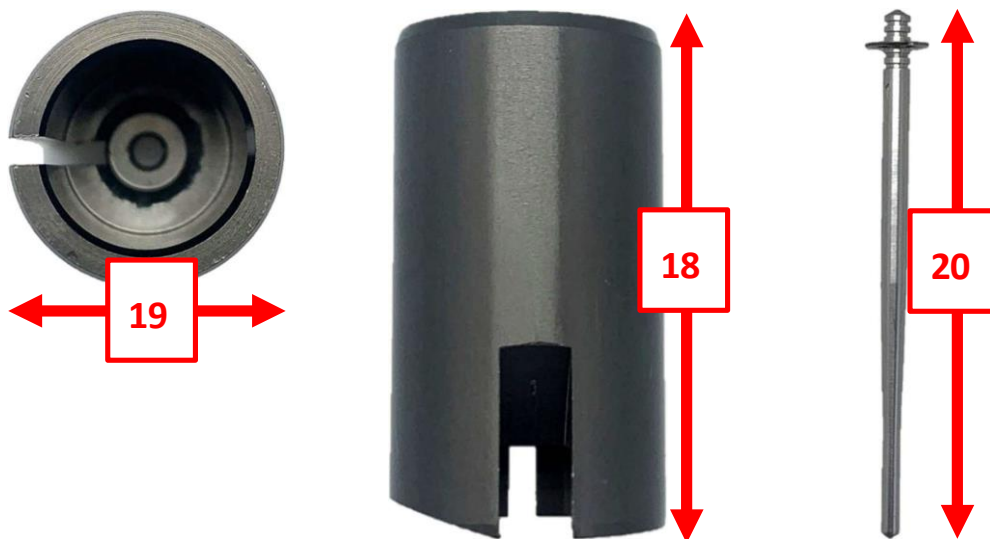
- 12. Emulsion Tube & Main Jet Length
- 13. Main Jet Orifice
- 14. Main Jet Emulsion Orifice x12



- 15. Pilot Jet Length
- 16. Pilot Jet Orifice
- 17. Pilot Jet Emulsion x6



- 18. Slide Length Max
- 19. Slide Diameter
- 20. Needle Length



### Contact Information and Resources

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[www.kartinghq.com.au](http://www.kartinghq.com.au)