



# ADVANCE PRODUCT SERVICE INFORMATION

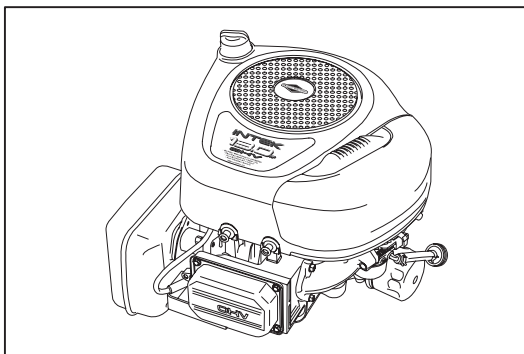
INFORMATION BULLETIN NO. 39

DATE 1/21/2003

SUBJECT Model Series 21 Vertical Crankshaft Engines

FILE IN 272147

This information will be added to Manual 272147 during the next revision.



## Specifications

Item	Model 21 – Vertical
Air Cleaner	Panel-style w/foam pre-cleaner
Armature Air Gap	.010" – .014" (0.25 – 0.36 mm)
Bore	3.437" (87.30 mm)
Bore Type	CI Sleeve
Carburetor Venturi	.625" (15.88 mm)
Compression Ratio	8.0:1
Crankshaft Bearings	Mag Side: Plain
	PTO Side: DU
Crankshaft End Play	.002" – .023" (0.05 – 0.58 mm)
Displacement	21 cu. in. (344 cc)
Emissions	Certified
Fuel Filter Type	75 Micron / 150 Micron w/pump
Fuel Tank Capacity	3-Quart (2.8 Liters)
Governed Low-Idle Speed	1750 RPM
Governor	Mechanical
Ignition	Magnetron®
Lubrication	Slinger / Pressure
Muffler	Square Lo-Tone
Oil Capacity	48 Fl. Oz. (1.4 Liters)
Oil Fill Style	High Oil Fill
Spark Plug Gap	.030" (.76 mm)
Stroke	2.264 in. (57.51 mm)
Torque (Max.)	16.7 ft. lb. (22.6 Nm) @ 2800 RPM
Valve Clearance (Measured Cold)	Intake .003" – .005" (0.08 – 0.13 mm)
	Exhaust .005" – .007" (0.13 – 0.18 mm)

## Fastener Specifications

Description	Wrench/Socket Size	Torque
Armature	5/16"	25 in. lbs. (3 Nm)
Blower Housing	3/8"	80 in. lbs. (9 Nm)
Breather Cover		60 in. lbs. (7 Nm)
Breather Reed		35 in. lbs. (4 Nm)
Carburetor Solenoid		44 in. lbs. (5 Nm)
Carburetor-to-Manifold		70 in. lbs. (8 Nm)

Casing Clamp .....		22 in. lbs. (2 Nm)
Connecting Rod .....	5/16"	150 in. lbs. (17 Nm)
Control Bracket .....	5/16"	30 in. lbs. (3 Nm)
Crankcase Cover .....	1/2"	200 in. lbs. (23 Nm)
Cylinder Head Bolts .....	1/2"	220 in. lbs. (25 Nm)
Cylinder Shield .....		30 in. lbs. (3 Nm)
Exhaust Manifold/Adapter .....		165 in. lbs. (19 Nm)
Flywheel Fan .....	1/2"	140 in. lbs. (16 Nm)
Flywheel Guard .....	1/4"	45 in. lbs. (5 Nm)
Flywheel Nut .....	1-1/8"	100 ft. lbs. (136 Nm)
Fuel Pump .....	5/16"	75 in. lbs. (8 Nm)
Governor Lever Nut .....	3/8"	40 in. lbs. (5 Nm)
Intake Manifold .....	3/8"	100 in. lbs. (11 Nm)
Muffler .....	1/2" or T40	180 in. lbs. (20 Nm)
Oil Drain Plug .....		125 in. lbs. (14 Nm)
Oil Fill Cap .....		40 in. lbs. (5 Nm)
Oil Fill Tube .....		25 in. lbs. (3 Nm)
Oil Pressure Switch .....		75 in. lbs. (8 Nm)
Oil Pump Cover .....		80 in. lbs. (9 Nm)
Rewind Starter to Blower Housing .....	5/16"	30 in. lbs. (3 Nm)
Rocker Arm Stud .....	5/16"	150 in. lbs. (17 Nm)
Rocker Ball Setscrew or Nut .....	13 mm/T-40	60 in. lbs. (7 Nm)
Spark Plugs .....	5/8" Deep	180 in. lbs. (20 Nm)
Starter Drive Cover .....	1/4"	22 in. lbs. (2 Nm)
Starter Motor Bracket .....	1/2"	140 in. lbs. (16 Nm)
Starter Motor Thru-Bolts .....	5/16"	25 in. lbs. (3 Nm)
Stator .....	1/4"	25 in. lbs. (3 Nm)
Valve Cover .....	3/8"	70 in. lbs. (8 Nm)
Voltage Regulator .....		65 in. lbs. (7 Nm)

### Standard and Reject Dimensions

Description	Standard Dimension	Reject Dimension
<b>Cylinder</b>		
Mag Bearing .....	1.380" (35.05 mm)	1.383" (35.13 mm)
Mag Bearing Depth .....	.119" (3.02 mm)	
Cam Bearing .....	.501" (12.73 mm)	.504" (12.80 mm)
<b>Cylinder Head</b>		
Intake –		
Valve Guide .....	.238" (6.05 mm)	.240" (6.10 mm)
Valve Stem .....	.235" (5.97 mm)	.233" (5.92 mm)
Valve Seat Width .....	3/64 – 5/64" (1.19 – 1.98 mm)	
Valve Seat Angle .....	44°	
Exhaust –		
Valve Guide .....	.238" (6.05 mm)	.240" (6.10 mm)
Valve Stem .....	.235" (5.97 mm)	.233" (5.92 mm)
Valve Seat Width .....	3/64 – 5/64" (1.19 – 1.98 mm)	
Valve Seat Angle .....	44°	
<b>Crankcase Cover/Sump</b>		
PTO Bearing .....	1.627" (41.33 mm)	1.629" (41.38 mm)
Cam Bearing .....	.501" (12.73 mm)	.504" (12.79 mm)
<b>Crankshaft</b>		
Crankpin Journal .....	1.499" (38.07 mm)	1.497" (38.02 mm)
Mag Journal .....	1.378" (35.00 mm)	1.376" (34.95 mm)
PTO Journal .....	1.625" (41.28 mm)	1.623" (41.22 mm)
Eccentrics .....	2.205" (56.01 mm)	2.202" (55.93 mm)
<b>Camshaft Journals</b> .....	.500" (12.70 mm)	.498" (12.65 mm)
<b>Connecting Rod</b>		
Crankpin Bearing .....	1.500" (38.10 mm)	1.502" (38.15 mm)
Piston Pin Bearing .....	.801" (20.35 mm)	.802" (20.37 mm)
<b>Counterweight System</b>		
AVS™ Bearing – Large End .....	2.207" (56.06 mm)	2.210" (56.13 mm)
Small End .....	.490" (12.45 mm)	.493" (12.52 mm)

**Piston Pin**

Diameter ..... .800" (20.32 mm) ..... .799" (20.29 mm)

**Piston**

Pin Bore ..... .800" (20.32 mm) ..... .801" (20.35 mm)

**Piston Ring**

Top Ring End Gap ..... .009" (.23 mm) ..... .025" (.64 mm)

Center Ring End Gap ..... .018" (.46 mm) ..... .030" (.76 mm)

Oil Ring End Gap ..... .010" (.25 mm) ..... .030" (.76 mm)

Ring Land Clearance ..... .005" (.13 mm) ..... .006" (.15 mm)

**Starter Rope**

Rope Size ..... #5.5

Rope Length ..... 63" (1.6 m)

**Carburetor Float Bowl Gasket Replacement – Vertical Shaft Engines**

**NOTE:** The carburetors used on the new engines use a gasket and an O-ring to seal the float assembly to the carburetor body. The installation of the gasket, O-ring and float assembly is detailed in the following steps.

1. Insert the O-ring to the fuel transfer tube on the float assembly, Fig. 1.

**NOTE:** It may be necessary to lubricate the O-ring for assembly. Be certain the O-ring is seated on the surface of the float assembly.

2. Place the gasket in the relief of the float assembly, Fig. 2.

3. Install the float assembly to the float bowl.

**NOTE:** Be certain the gasket stays in the float assembly relief. Fig. 3.

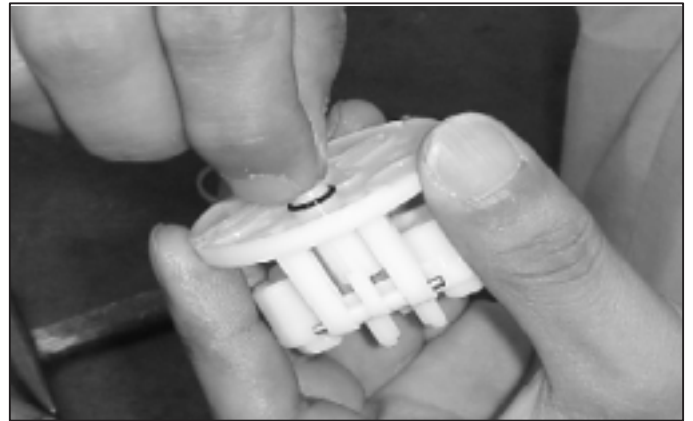


Fig. 1



Fig. 2



Fig. 3

4. Install the float bowl to the carburetor body, Fig. 4.

**NOTE:** Make sure the fuel transfer tube outlet is inserted to the carburetor body fuel inlet. Confirm that the gasket has remained in position.



Fig. 4

5. Fasten the float bowl to the carburetor with two screws, Fig. 5.

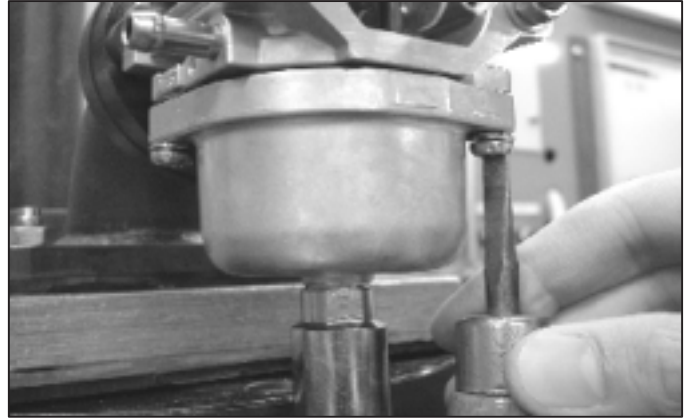


Fig. 5

6. To verify an airtight fuel path, invert the carburetor body. Apply 4.25 psi (29.4 kPa) of air pressure to the fuel inlet. Fig. 6. If there is no pressure loss within 10 seconds the seal is good.

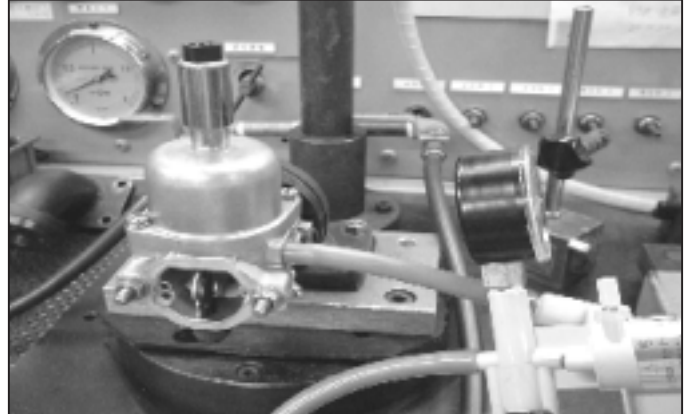


Fig. 6

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