

Engine Management

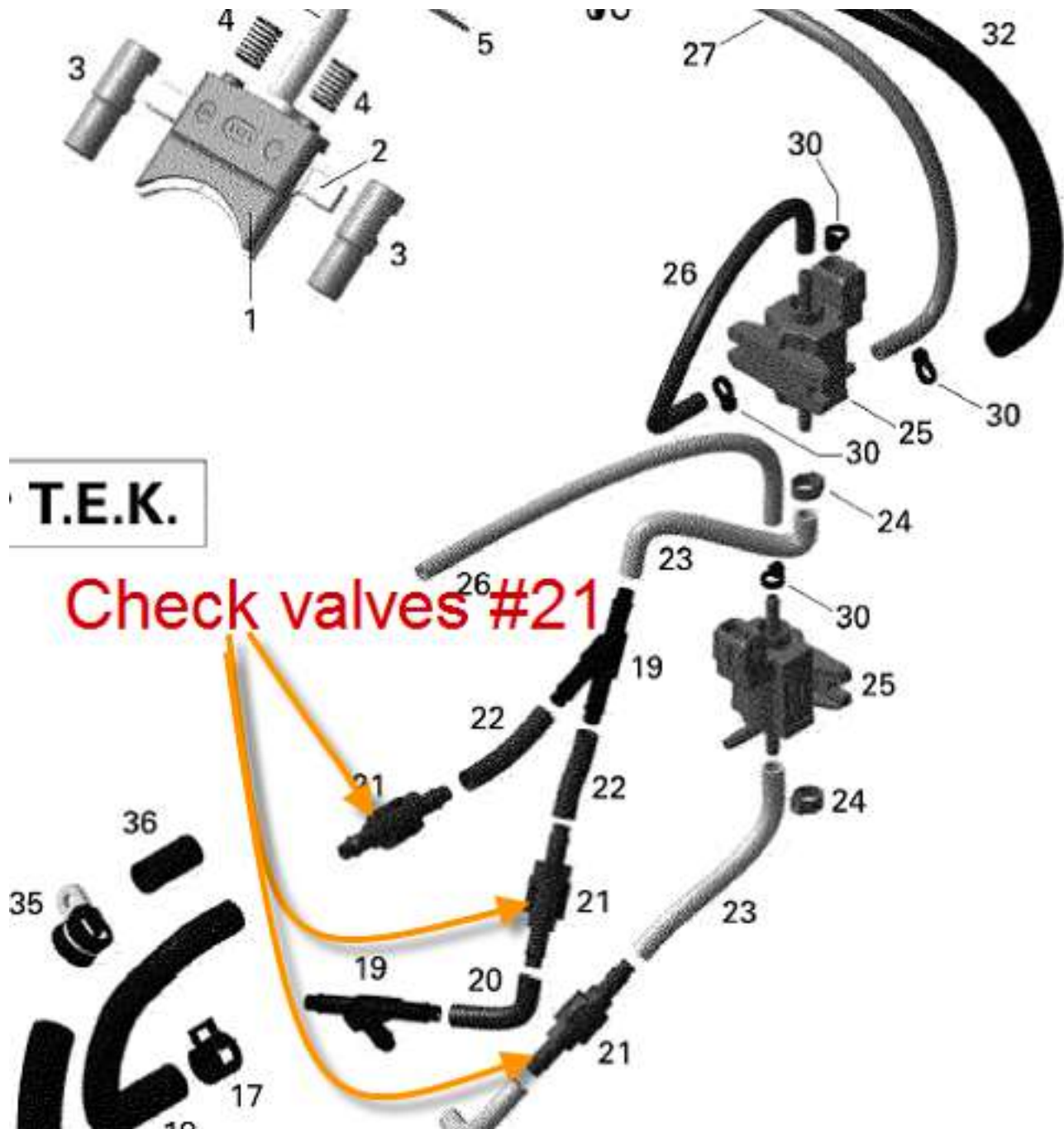
Comprises the management of engineered activities; fuel delivery, air/pressure, coolant, acuta-tion(exhaust controls), occurrences analysis/recording/reporting(gages)

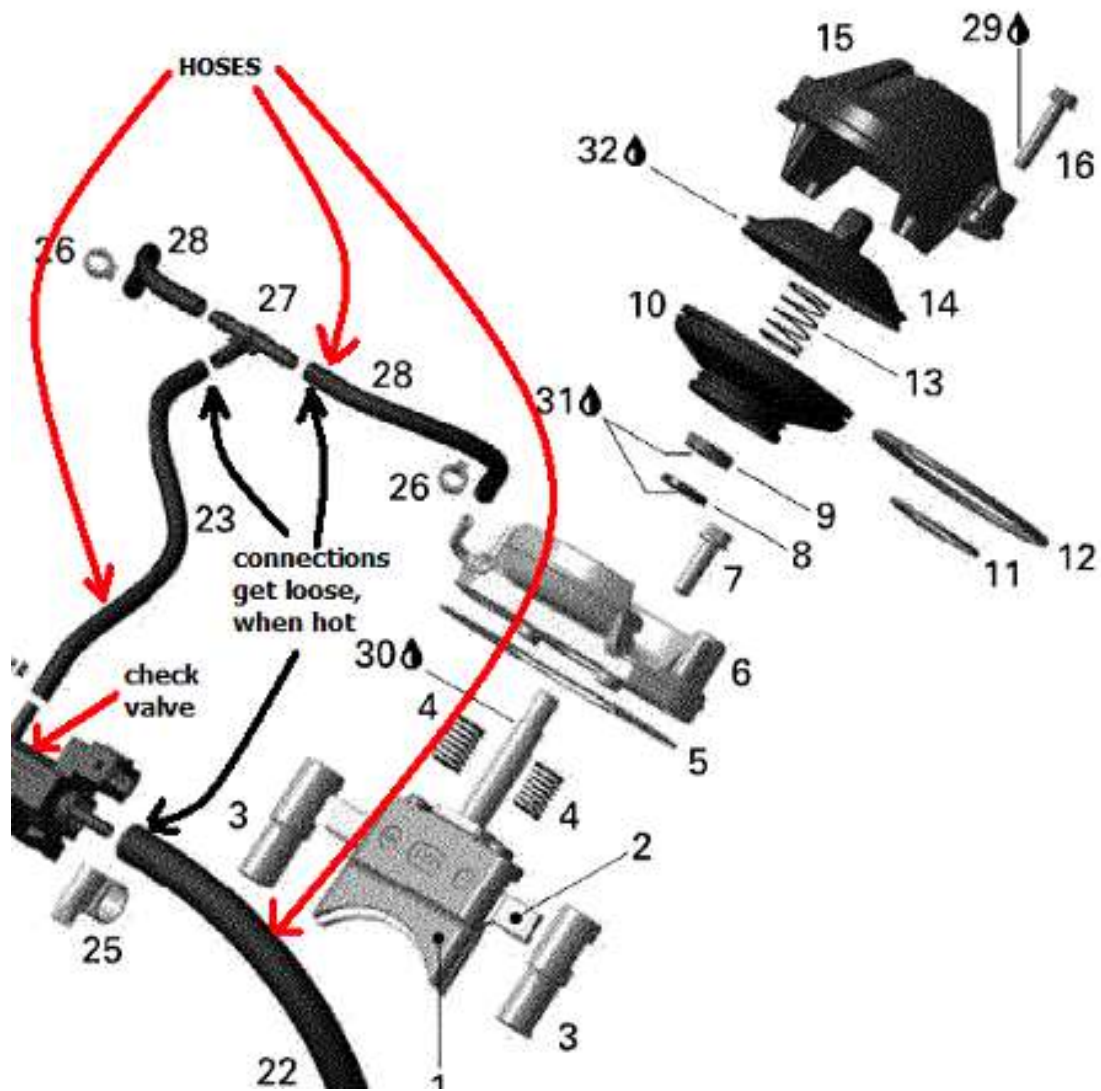
Rave Check Valves

Events - (Engine will reach maximum rpm only for a moment) The sled would pull well for 2-3 seconds, then rpms start drifting low forcing you to turn out.

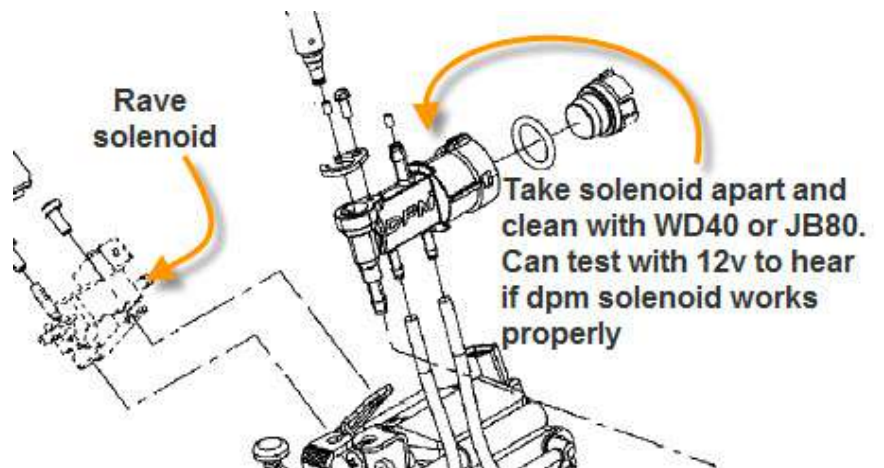
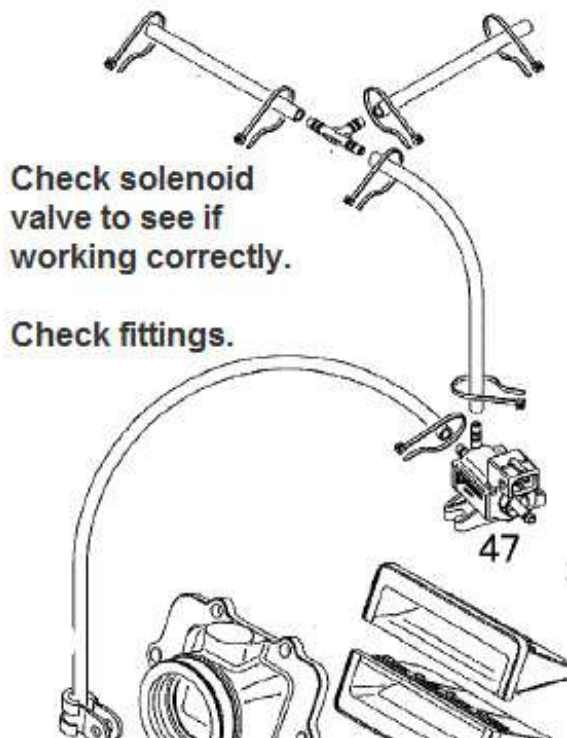
1)Ensure that all rave check valves are phased in the proper direction.

2)Check valve leak test - Install test pump and pressure to 5psi. Valve should stand pressure. Install pump opposite side, pump, air should flow freely.





800 PTEC engine



SLOW REACTING RAVE SOLENOIDS – POOR FUEL ECONOMY AND POOR PERFORMANCE

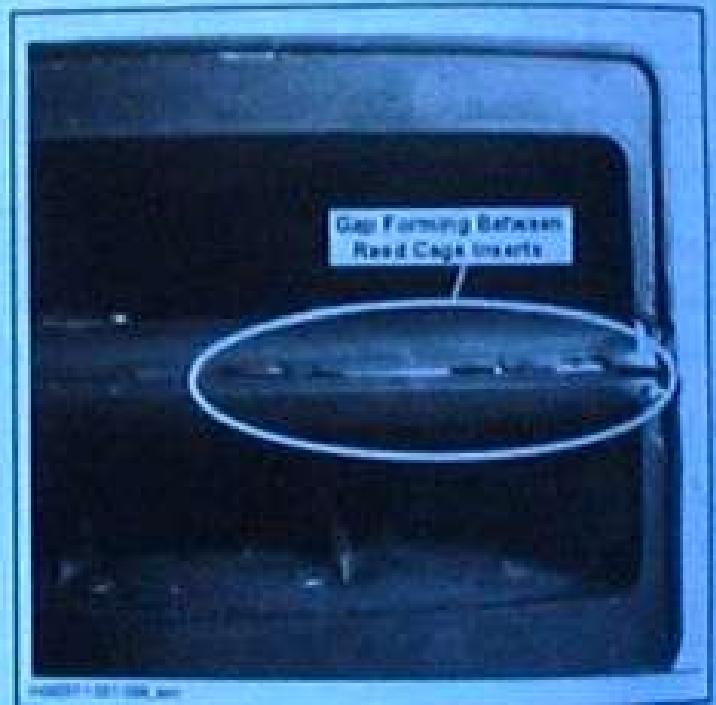
There have been reports on units with either the 800R Power TEK, 600 E-TEC or 800 E-TEC that either the fuel economy had fallen off or the performance had fallen off in certain RPM ranges. Some units were reported to have both of the issues. From the reports received back from those involved with these complaints, it was found that all of the testing as per the shop manual was correct. **Except for, when watching if the RAVEs were going through the three positions with the RAVE caps off, it was noticed that the RAVE valves were very slow reacting going from one position to the next.** In many of these cases there were no vacuum or pressure leaks found, the electrical activation to the solenoids tested good and the solenoids themselves tested to be good as per specifications. In most of these cases it was found by replacing the RAVE solenoids with known good RAVE solenoids the RAVE valves returned back to the quick movement through the three positions and the unit returned back to the original good fuel economy and good performance. From there it was isolated to which solenoid was causing the issue by swapping out the front or back to figure out which one was actually the bad part. RAVE solenoids that are found to be slow reacting or borderline sealing internally may also indicate an issue with the sealing of the reed cage inserts or the reeds themselves which may have a small effect on primary compression which is used to apply vacuum and pressure to the RAVE solenoids.

800R Reed Cage Inserts Mating Surface Gap (ties in with [slow reacting rave solenoids])

800R REED CAGE INSERTS MATING SURFACE GAP

The 800R engine platform uses a high air flow dual V type reed cage design where there is an upper and lower reed cage insert to implement the use of twelve reed pedals. On some 800R snowmobiles there have been reports of poor idling, poor RER function, poor fuel economy, lack of mid-range performance or lack of wide open power. It has been found that any of these conditions can be related to the reed cage inserts coming apart where they should seal together when installed in the cylinder.

So when inspecting the reed cage inserts always pay extra attention to see if there is a gap forming on the mating surfaces of the reed cage inserts from delamination or vibration which can affect primary compression. Borderline sealing RAVE solenoids or slow reacting RAVE valves may be a sign that the primary compression has been compromised on an 800R engine. See the technical tip in this section on slow reacting rave solenoids. Normal warranty applies.



800R Engine Detonation Level Detected - Too high - Code P-1326

Ski-Doo has made available to their dealer network a new software update for their 2009 Ski-Doo models fitted with the 800R engine package. Some units would go into a permanent limp-home mode (engine detonation level detected too high) that required a dealer to reset the mode.

If this should occur,(Code P-1326) an authorized Ski-Doo dealer can upload the new calibration into your machine. This calibration will still protect the engine from detonation and if needed it will limit the engine to limp home.

This new calibration allows the user to reset the limp-home by simply shutting the unit off and restart-it, instead of having to take it into the dealer to be reset with BUDS.

Crankshaft & Crankcase

800R known for bad crankshaft wobble that contributes to excessive clutch wear and short belt life. Get the clutch off the engine.

Get a dial indicator on the end of the crankshaft stub to check for crank end excessive runout. Crank taper may be out of spec and this will certainly cause excessive premature wear of new clutch components.

Put dial indicator 1/8 inch in from end of crank stub.

Maximum deflection PTO side is 0.06mm (.0024) engine type = ALL

I have had a customer who warantee a crank on an 08 and it took 4 crankshafts from BRP before a spec crank showed up - crank came in, checked runout,(.003+) sent it back Nuther crank come in, again (.003+) sent it back, nuther crank come in (.0025) sent it back. 4th crank come in and (.002) The 4th crank came with less than out of spec runout.

2007 crankshaft #420892562 - Newest crank with old mag end taper

2008 crankshaft #420892562 - Newest crank with old mag end, new center bearings

2009 crankshaft #420892567 - Newest crank with longer mag end taper, new center bearings.

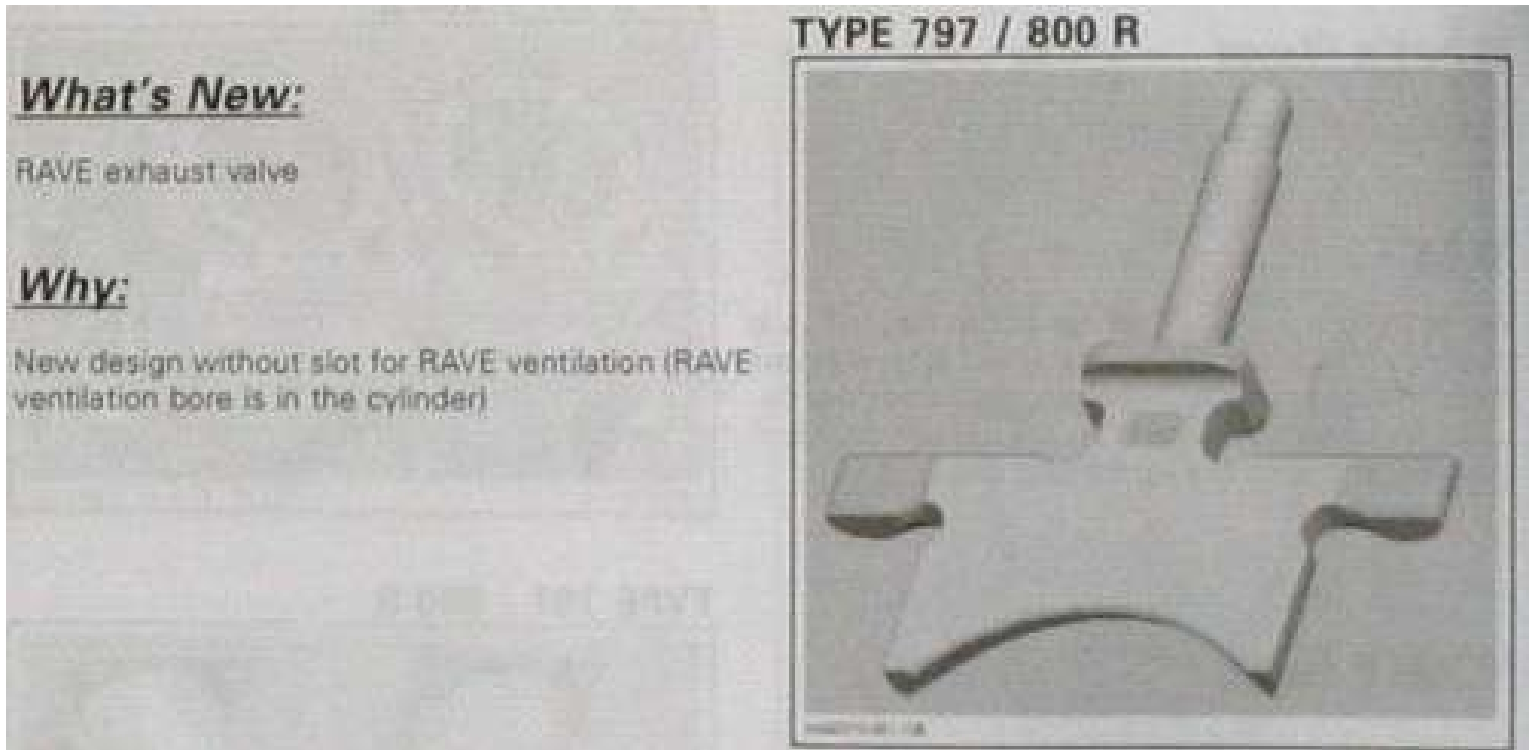
2007 short block	(P/N 421 000 645)	New 2008 shortblock execution with Rev base plate installed, impulse fitting connectors included.
2007 crankshaft	(P/N 420 892 562)	Newest execution with old mag end taper.
2007 crankcase	(P/N 420 890 744)	2008 REV-XP crankcase opened up .01 mm larger. Will need Rev button plate added.
2008 short block	(P/N 420 079 707)	Newest execution with old mag end, new center bearings.
2008 crankshaft	(P/N 420 892 562)	Newest execution with old mag end, new center bearings.
2008 crankcase	(P/N 420 890 744)	REV-XP engine mount style with case opened up .01 mm larger.
2009 shortblock	(P/N 420 079 706)	New execution with longer mag end taper, new center bearings.
2009 crankshaft	(P/N 420 892 567)	New execution with longer mag end taper, new center bearings.
2009 crankcase	(P/N 420 890 748)	Newest execution REV-XP engine mount style.

A- Contaminated Carburetors No. 2008-12

B- Kinked DPM Vent Hose

C-Corroded DPM solenoids 2009 model

D- 800R rave valves. 2010 update



E- 2009 800R Crankshaft and Shortblock update.

2 major changes. 2009 magneto end taper is longer and will only work with 2009 flyweel. Second change is center main bearings are grease filled with integrated seals. Different big end bearings, polished connecting rods

After-Muffler Outlet Damage from Impacts

Don't overlook a basic inspection point when diagnosing the engine having low rpms when full throttle or engine does not have full power. Inspect exhaust after muffler outlet and confirm there is no damage to the roundness of outlet.

If outlet is obstructed by dent, then straighten and look inside to inspect for internal damage to the inner wall to further see if deeper obstruction.

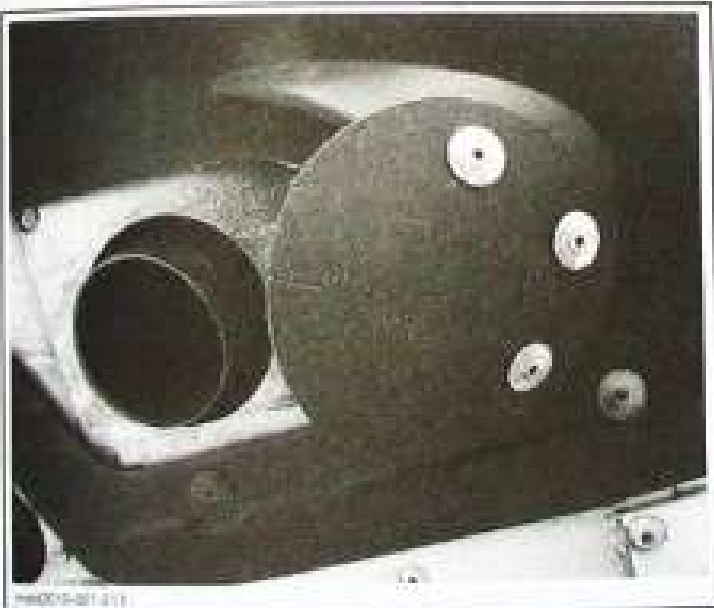
Additional snow deflector BRP#502006935

AFTER-MUFFLER OUTLET DAMAGED FROM IMPACTS

Technicians sometimes overlook a basic inspection point when diagnosing a snowmobile that doesn't rev to full rpms or doesn't have full power. By just inspecting the exhaust after-muffler outlet, it can easily be seen if there has been rock, stump or other impact to the exhaust outlet.



If the after-muffler-outlet is bent inward, the exhaust flow can be obstructed which can affect the way the engine breathes and can adversely affect engine performance. If the exhaust after-muffler outlet is bent, normally it can be straightened back to its original shape enough so it does not obstruct exhaust flow. If the damage is so severe to the outlet that the bottom of the after-muffler is bent, it is possible that there has been internal damage done to the after-muffler. In this scenario the after-muffler should be replaced. For race conditions, the Rev-XP 600 RS race sled comes with the addition of a snow deflector that can aid with additional protection for the after-muffler outlet on standard production Ski-Doo snowmobiles. This snow deflector is available through the BRP PAC department. Warranty does not apply.



SNOW DEFLECTOR

(P/N 502 006 935) QTY 1

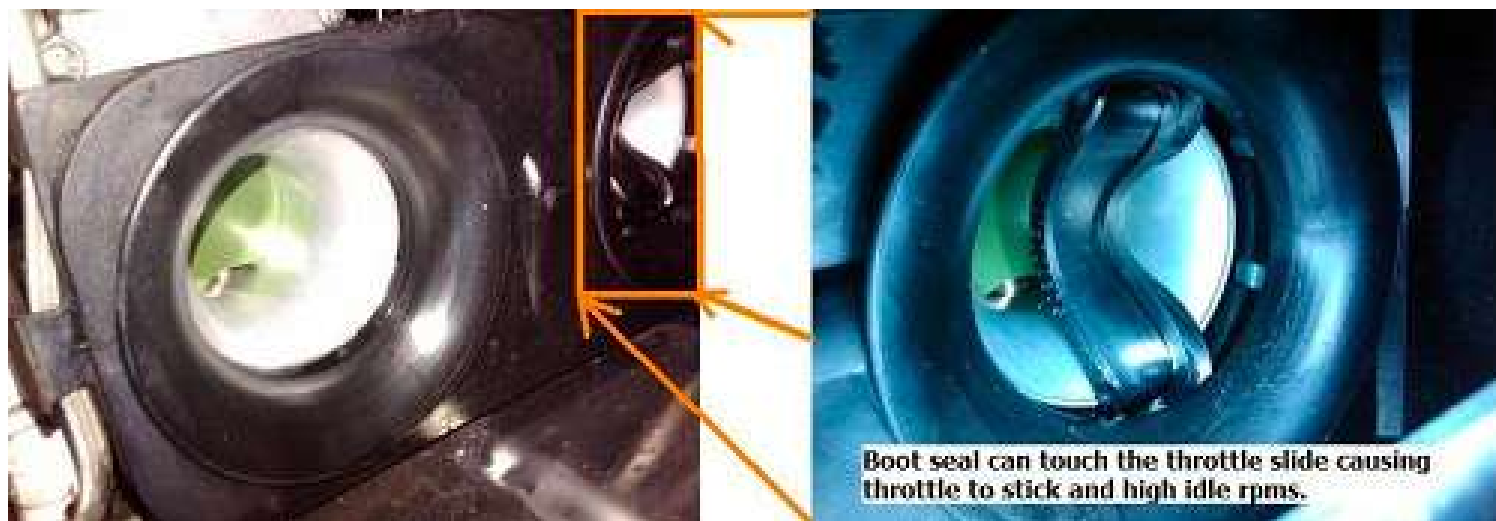
Note E-10 fuel should not be equated with E-85 which contains 85% ethonol.

If E-85 is used it will cause engine starting difficulties and engine power fluctuations and even engine damage.

E-10 fuel = 10% ethonol, the BRP engine is designed to run with, use the highest octane available.

Throttle sticking (possible causes)

Deformed Air Intake Adapter - Boot seal can touch the throttle slide causing throttle to stick and have high idle rpms. (well known to happen on 09/10 models)



Throttle Cable Adjustment

If you have changed your handlebar riser, confirm that the throttle cable is adjusted properly. I have had customers who run the 09xp clutch kit and could not get correct rpms at all even after emptying the flyweight pins. After much grief looking all over the sled at engine management and such, ended up taking the airbox off and running the throttle full open - notice that the throttle slides only going to about 3/4 open.

Have had 2 customers end up with this result so hope it is one of the details you check after you do a mod.