ROM Identification / Charge Coil Test Specifications

Model	System Type	ROM ID	ROM PN	Battery Charge Coil Test Position/Resistance
1990 RXL	I	1990 V2	Contact Service Dept.	G to G/W .3 to .5 ohms
1991 RXL	I	FSM 582	4040032	G to G/W .3 to .5 ohms
1991 500	II	FSM 752	4040033	G to G/W .3 to .5 ohms
1992 RXL	I	FSM 582	4040032	G to B/W .2 to .4 ohms B/W to G/W .2 to .4 ohms
1992 500	II	FSM 752	4040033	G to G/W .3 to .5 ohms
1993 RXL	I	FSM 583	4040036	G to B/W .2 to .4 ohms B/W to G/W .2 to .4 ohms
1993 500	II	FSM 762	4040037	G to G/W .2 to .4 ohms
1994-1995 RXL	I	FSM 5B1	4040044	G to B/W .2 to .4 ohms B/W to G/W .2 to .4 ohms
1994 500	II	FSM 782	4040043	G to B/W .2 to .4 ohms B/W to G/W .2 to .4 ohms
1995 500	II	1995 500 V1	4040051	G to B/W .2 to .4 ohms B/W to G/W .2 to .4 ohms
1993-1995 RXL	I	1995 650 V1	4040057	G to B/W .2 to .4 ohms B/W to G/W .2 to .4 ohms

Optional ROMs for special applications

ROM ID	Part Number	Application	Description
1992 500 V2	4040038	1991-1992 500	For repeated lean failures and lean starts.
1994 650 HE1	4040042	1993-1994 RXL	For high elevation lean drive away. Calibrated for ethanol.

NOTE: FSM 5B1 and 1994 650 HE1 can be used for 1991-1992 RXLs, but may experience rich mid-range and reduced fuel economy.

The machines equipped with Polaris Electronic Fuel Injection (EFI) have many advantages over the normal carburetor equipped models. The most noticeable improvements will be ease of throttle operation, better cold weather starting and improved cold engine drive away. The EFI system also compensates for temperature and altitude, and with minor adjustments will perform well over a wide range of temperatures and altitudes.

To assist technicians in troubleshooting and understanding the EFI, we have divided it into three separate systems. The following is a short description of these three systems:

System I is battery, battery charging, and how the EFI is powered up or energized.

System II is fuel handling, fuel filtering, and fuel pressure regulations.

System III is electronics control, which includes the Electronic Control Unit (ECU), ECU inputs from various sensors, and control of fuel to the cylinders by injector operation.

The following information is a more detailed explanation of the three systems. It's very important during diagnosis that each of these systems be checked. Failure to do so may result in a reoccurrence of that particular problem.

Basic Operation - System I
Battery, Battery Charging and Powering Up

The battery is the heart of the EFI system, its condition is critical to all EFI functions. Long off-season storage periods, the high vibrations and extreme temperature variations which are encountered in snowmobile applications make periodic battery inspection and service essential.

Some Polaris EFI systems have an alternator or charging system which will produce just enough output to maintain the EFI system (1990-1991 RXL). If the battery is partially shorted, or if connections offer any high resistance, the result might be a lean fuel condition.

Electronic Fuel Injection Data

EFI models have two separate alternators or charging systems. One is used for lighting and accessories, the other for battery charging and EFI operation. The battery size and alternator size have been designed to provide adequate output for the EFI system. If your sled is equipped with electric start, a larger battery will be required to provide adequate cold cranking amperage.

CAUTION: At no time should any accessories be added to the battery or battery side of the charging system. To do so may overload the system, discharge the battery and cause substandard EFI operation.

To power up or turn on the EFI system, we have utilized different methods. To explain properly, we have to talk about the two basic EFI types:

TYPE I - The Type I system is used on all RXLs. To power up requires both key and auxiliary switches to be in the "Run" position. At that time, a circuit is completed between the battery positive terminal and the brown relay which passes through the switches and the circuit breaker. The brown relay then connects the battery directly to the ECU via the fuse link, causing the ECU to begin to function. The ECU connects itself to the battery via the self shut-off relay, which serves to maintain power to the ECU for approximately ten minutes after power is cut off by the key or auxiliary switches. The ECU is kept on for a short time in order to help prevent flooding of the engine during a restart a short time after the engine has been shut off.

When the ECU is first powered up, the fuel pump will run for approximately five seconds in order to build up fuel pressure in the rail. If the engine is stopped by the switches and then restarted within the ten minute period, the fuel pump will not repeat the five second run, since the ECU was kept powered up by the self shut-off relay.

If the engine is stopped or dies with the switches in the "Run" position, the ECU will remain powered up until the battery is drained.

TYPE II - The Type II system is used on all 500 EFI models. The 1991 and 1992 models power up differently than the 1993 and later models. The Type II system is similar to the Type I system in the way that it maintains power to the ECU after the engine stops, but is different in the way that it powers down. The Type I system depends on the operator to turn off at least one of the switches before the ECU will power down. The Type II system will power down regardless of the position of the switches in the event that the engine stops unexpectedly. This preserves battery power.

1991 And 1992 Model Type II Systems

These systems use a "READY" light on the dash panel to indicate that the ECU is powered up and "ready" to go. Power to the system does not pass through the auxiliary switch as it does on the Type I system. This switch only grounds the ignition system like those on carbureted engines. Power to the system is supplied primarily through the self shut-off relay and the key switch.

The key switch has three positions: OFF, RUN, and SYSTEM RESET/START. In the OFF position, the ignition is grounded. In the run position, the switch does nothing. It is not connected to any wire in this position. The SYSTEM RESET/START position is spring loaded, so the switch returns to the RUN position when the operator releases it. In the SYSTEM RESET/START position battery power is connected to the ECU via the fuse link, allowing the ECU to initialize and connect itself to the battery using the self shut-off relay. When the key switch is allowed to return to the RUN position, the ECU is powered only by the self shut-off relay.

If the engine is stopped the ECU will remain powered by the self shut-off relay for a period which varies with engine temperature. If the engine is warm the ECU will power down almost immediately. If the engine is cold it may stay powered up for as long as five minutes. The key only needs to be turned to the SYSTEM RESET/START position if the "READY" light is not on.

1993 And Later Type II Systems

These systems are similar to the earlier Type II systems in function, but do not have a "READY" light or a SYSTEM RESET/START position on the key switch. The key switch on these models only grounds the ignition in order to stop the engine. There is no battery power connected to the switch in these models, unless electric start is used.

This system uses and Alternator Controlled Switch (ACS) to power up the system. It is mounted on the battery box and also houses the voltage regulator/rectifier. This device senses the rotation of the crankshaft by recognizing output from the engine's alternator. It then connects power to the ECU just as the earlier Type II system does when the operator turns the key switch to the SYSTEM RESET/START position. This system eliminates the need for a "READY" light and a complicated key switch. The operator simply pulls on the rope and the system powers up automatically.