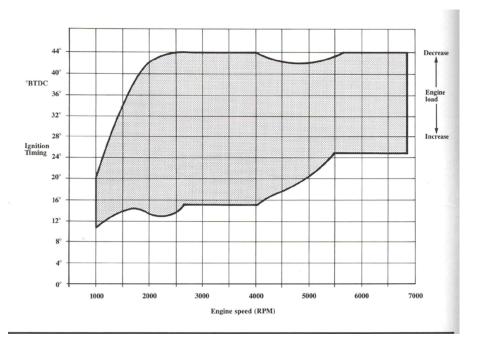**034EFI Ignition Supplement**

Currently, the 034efi ECU will control fueling parameters only. A fully programmable ignition side is in development, and planned release is winter 2002. Any factory CIS ignition system can be adapted to function properly, however; this supplement will explore some of the factory Audi CIS systems and their adaptation.

CIS, CIS-E and KE Jetronic systems *as on the type 85 4k and coupe cars-* This is a very simple system that requires very little to no adaptation. In NA form, no changes should be made from stock settings, timing can be advanced to the detonation limit as the fuel and application allows. The load output from the 034efi ECU needs not be used. In turbocharged application, initial advance can be retarded to prevent detonation under boost, ensure that the vacuum advance canister on the distributor is air tight, however. In heavily boosted, high HP applications, a product such as MSD's boost timing master control can retard timing from 0-3 degrees per pound of boost up to 20 degrees of retard. This system is basic and versatile, but high very hp applications (above 300hp) should look to a different system for ignition control. This system does not use any "maps", instead having a fixed rate of timing advance; nor does it incorporate knock-sensing protection. The stock 5-window distributor hall sender will provide the proper rpm signal to the 034efi ECU. Ensure that all throttle switches are intact.

CIS Motronic systems *as on the type 44 5000/200 turbo cars-* This ignition system was used in two forms, the first the MAC 11 used in 1986-88 5000TQ, 5000T, early 1989 Model 200T/Q, single knock sensor MC engine, 7:8 to 1 compression ratio. The MAC 14 ECU was used in later 1989-90 Turbo Quattro, 1989-91 200 Turbo dual knock sensor MC-2 engine with 8:4 to 1 compression ratio. These are by far the best-suited ignition systems for turbocharged applications. For ultra high output applications, the MAC 14 can be combined with a low compression motor for high detonation resistance. This system can be quite easily transferred to different applications by using the entire harness with sensors, throttle switches, distributor, etc. A pin will need to be added to the flywheel at the point of 62 degrees BTDC (35 teeth before the flywheel TDC mark) if not using the MC flywheel. This
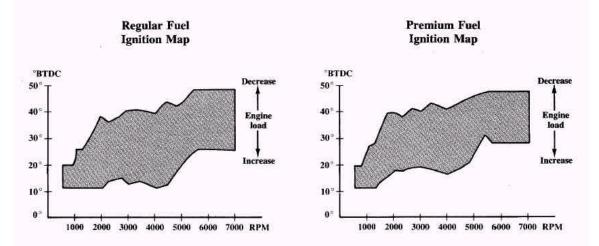
system is also manifold vacuum referenced for an accurate load measure, and has special maps that compensate for boost, temperature, idle, WOT, and varying conditions. Using this system, 5 pins will need to be added to the cam gear with a hall sender for the proper rpm signal to the 034efi ECU. ISV function will be maintained using this system, as is full ignition fault code output.

MC timing map based on load

CIS-III systems *as on the 80/90/100 cars-* This is the most advanced of the 10v CIS NA ignition systems, and was provided on the 80/90/100 series NG/NF 2.3l cars. This system uses a "mapped" ignition, where, based on load, temperature and altitude will choose a timing map most ideal for the conditions. This system would be most preferable for a high performance NA car, since the timing maps are optimized for a high compression NA motor. This system also incorporates the safety of knock sensing. Using this system in boosted applications will take careful matching and tuning of the system to prevent detonation, as its timing maps are quite advanced. Using race gas, the advanced nature of the maps will not be as much of a concern as they are in street applications. The load output of the 034efi ECU will be input to the stock ignition ECU, via the center pin of the potentiometer plug, formerly taking its place on the side of the airflow plate. Using this load output, the ignition system will vary timing advance based on the engine load. Initial

advance, which is set to 15 degrees BTDC stock, will most likely have to be lowered to the 6-10 degree range to prevent excessive detonation.

CIS-III ignition maps are based on load. When water temperature is above 149 F., the system will automatically switch to the Premium Fuel Map, if excessive detonation occurs, however, the system will automatically switch to the Regular Fuel Map.

If excessive detonation is found using the standard 034EFI load output, a GM 1 Bar MAP sensor can be used to replace the ECU load output. This sensor can be sourced through 034EFI or a local auto parts store. This MAP sensor has 4 connections:

- A – Ground to potentiometer harness
- B – Load signal to igniton ecu
- C – 5V input from potentiometer harness
- Manifold referenced vacuum

Initial advance can be set in the 15 to 20 degree BTDC range using this method, and is recommended for applications running over 10psi boost or street applications where high octane race gas is not available.

The idle switch should be maintained to ensure proper timing and ISV function, but the WOT switch may cause fault codes and limp home mode activation, and should be left off.

Also, with heavily retarded base idle settings, the older vacuum advance 5-window distributor from the CIS-E and KE systems can be used to increase idle and part throttle timing by 6 degrees. The 5-window distributor hall sender will output the proper RPM signal for the 034EFI ECU.

034EFI is continually in development with its fuel and ignition product, and is developing electronic controls that will allow more fine tuning and control over all of the excellent factory ignition systems.

For additional information, please contact 034EFI: *contact@034efi.com*