TFI/HEI upgrade Jeep CJ
I had an HEI distributor for about a year and it was a huge improvement. But when I heard about this upgrade and since I'm always keen on trying I started with this. The outcome was outstanding.
I was interested in comparing the stock, HEI, TFI and the TFI/HEI ignition so I bought an ignition tester.
The TFI ignition (with resistive wire) was close to the HEI but the hybrid, TFI/HEI, produced 40% more spark energy!!
This file shows how to use the TFI ignition with full 12V.
This upgrade is complementary with the MC2100 upgrade.

Parts Needed
Ford cap, rotor and cap adapter from a 1984 Ford F-150 Pickup with the 300, 6 cyl.

Always get the best quality parts available.
Cap should be made with brass terminal and those should be cast with the cap and not pressed after the cap was cast.

Why is this so important? The resistance at the spark plugs electrode at both caps is about 0.4 ohms. At the center electrode, ignition coil electrode, its 0.4 ohms in the blue cap and 80-180 ohms in the cheap gray cap... this will kill the spark.

Ignition coil- an old Motorcraft TFI coil from the junkyard will work better than most of the after market ignition coil. If you can afford it get an MSD TFI coil.

Ignition wires- you don't need fancy wires and you won't gain more from your ignition, get 8mm wire for the Jeep 4.0L engine (YJ), perfect fit.
**Ignition module** - GM 4 pin module, Delco part # D1906. Any equivalent from a known brand will do.
Napa: Tp45, Borg warner: Cbe4, Transpo: Dm1906, Wells: Dr100.

**Heat sink** - get a heat sink from an old computer or buy a new one. Take the module with you for getting the right size.

**Heat sink compound** - do not use the stuff that comes with the module, buy a compound that is intended for computer processors.

**Wiring:**
Before you start messing with the ignition do the following:
- Check the voltage on the battery poles, it should be about 14V with the engine on or 12v when off. Place the voltmeter black probe on the battery (-) and the red one on the battery (+).
- Now, check the voltage between the positive pole of the battery (red probe) and a clean spot, with no paint, at the engine head (black probe). If there's a need scrape the paint and dirt until you get a clean spot.
- The reading should be at the lowest 90% of the reading on the battery poles.
- If it is any less you should work on the grounding to the engine—VERY IMPORTANT FOR GETTING A GOOD SPARK.

**Wiring:**
Option 1.
The wiring for best performance should be as follows:

- When it said solid ground it means directly to the battery negative pole.
- The wire gauge is important for best performance.
- Soldering is the recommended method.
- Use new wires and follow the right colours for easy, later on, maintenance.

The wire from the ignition switch should be connected to the point where the wire from the switch splits to the module and to the coil, see picture:

(John Strenk Picture)
Disconnected the resistive wire and the wire to the stock module.
Connect the new, 10ga wire, by crimping or soldering, to the wire coming from the ignition switch. This wire should go all the way in one piece to the coil (+) terminal.

**Module:**
Get a heat sink and heat sink paste, not dielectric grease!
Cut off the two pin that are at the module base side.
Do all the measurements and drilling to the heat sink and find a place to mount it. For me the best and closest was the battery tray mount:
This way there are no wires from and to the engine block from the fender where most people mount the module. The wires length is also a concern; more than 3 feet from the distributor will reduce the output.

Clean the matting surface of the module and heat sink with carburetor cleaner and generously smear the metal base of the module with the heat sink compound and on to the heat sink along with the wire to the battery (-) pole and the wire to the dist. As in the wiring diagram.
Use bolts and nuts to hold the nodule. Self drilling or sheet metal screws will not hold for long on aluminum.

The red wire from B terminal of the module should connect to the 10ga wire that you should already have, from the ign switch to the coil. By soldering! Connect the wire from the starter solenoid to the same spot (the stock, 14ga, wire that is already there will do fine). This is how it should look [see soldering tips]:

![From Ign switch to coil](image)

The green goes from C directly to the (-) terminal of the ignition coil. This is one of the important wires, make sure you have good contact and that the wire is in good shape.

The purple and orange wires (W and G respectively) to the distributor must be twisted together or you'll have false module triggering due to electronic interferences.

The other end of the distributors wires is connecting to the distributor pick up, you can use the stock connector or get a new, waterproof, connector to replace the old one.

**Ignition coil mounts:**
The bracket for the coil is the simple and effective. The coil needs a solid ground and the engine block has a good ground already if you already did the above check. It also keeps it close to the dist without long wires that reduce the output. There is no need to worry about the heat, 258 will never get that hot like Ford or Mazda were those coils where design to operate.
Almost there...

Note which of the wires goes to spark plug 1, the closest to the radiator.
- take out all the wires.
- take off the old dist cap and rotor.
- bolt on the cap adapter, the rotor and cap. This is the fun part.
- reconnect No 1 spark plug and follow this order for the rest:
**General**
- Use dielectric grease on all the connectors including the inside of the spark plug boots. Dielectric grease is a must for car maintenance.
- Use copper grease on the battery terminals and on the ground wire ends from the battery to the engine block.
- Clean the starter solenoid poles and wires with electrical connectors cleaner. Then apply a thin layer of dielectric grease on all the metal connectors and poles.

**Testing your ignition**
1. Set the voltmeter to volt test.
2. Start the engine.
3. Check the voltage on the battery poles. Red probe on (+) and black on (-).
4. Check the voltage on the coil (+) terminal and the battery (-). Red probe on the coil (+) terminal and black probe on the battery (-) pole.
5. The reading on the coil must be about 95% and higher than the battery reading.

If it's not, check the battery connections, replace the battery cables if needed. Those were intended for 6-7 years of use and not 20 years.

6. Check the tach connector under the dash, this connector tends to corrode.

(John Strenk Picture)
7. Clean with electrical contact spray cleaner and generously coat all the above connections with dielectric grease.

8. Check the grounding on the module (-) wire from the battery, place the voltmeter black probe on the module wire and the red one on the battery (+).
9. The reading should be similar to the reading at paragraph 2

The end result:

![Image of a car engine with connections and tools]

**Basic soldering tips**
Soldering is the right way to handle wiring, when done right it will keep your CJ electrical free from bad/loose connections.

**Tools:**
- Soldering gun - 20W - 40W
- Soldering iron 60/40 will do fine.
- Soldering paste.

I'm not going to elaborate too much on this matter, just look at pictures and see what it should look like.

**Connecting two wires:**
- Allow the soldering iron 5-10 min to heat up.
- Coat both wires with soldering paste
- Melt a bit of solder on the gun tip and place it on the wire.
- Let it warm up until the solder from the gun is flowing into the wire than add more solder by placing the solder on the wire close to the tip.
- Move the solder and the soldering iron slowly across the wires, coating it.
1. Strip about 1 inch from each wire.
2. Twist the wires as in the picture.
3. Just about right.
4. Not enough solder.
5. Too much solder.
6. Insulating with electrical tape.
Connecting 14ga wires to a 10ga without cutting:

1. Strip about 1 1/2 inch.
2. Coat all the wires with soldering paste.
3. Twist the 14ga wires on the 10ga wire.
5. After soldering.

Last tip- practice again and again until you’ll get good results.

More info on this upgrade can be found at:

Geer Hed TFI links -very useful site.

jeepforum.com

jeepsunlimited.com

And this is one of the most informative threads on ignition.

Thanks to John Strenk for the help and for the pictures.

Questions? coas21@hotmail.com

***DISCLAIMER - Please note that this writeup reflects my experiences only and anyone using it for reference or as a guide, etc. does so at their own risk.