UNPACKING

Carefully unpack your new Centech Jeep Wiring Kit. Note that there are three separate plastic bags with each containing one wiring section for your Jeep. There is the engine compartment wiring, the passenger compartment wiring and the rear section wiring harness. This kit has been broken down into these three sections to make it easier for you to install your harness.

TOOLS

This kit requires only the basic hand tools for installation. You will need the following tools:

Screwdivers
Nut driver or Socket Set
Drill Motor and Drills
5/8" Holesaw or Greenlee Punch
Electrical Terminal Crimping Tool
Soldering Iron
Factory Jeep Manual or Haynes Repair Manual

FEATURES

Every Centech Jeep wiring kit has been designed for maximum reliability and flexibility. Reliability has been improved by our use of only the highest quality materials including special "cross-link" insulated wires and the new weather-proof connectors. Additionally, we have re-designed the firewall connection system to include a modern bulk-head connector employing individually sealed wires. Mounting hardware is stainless steel for longevity and most terminals are soldered to increase reliability.

Each kit includes special wiring in the engine compartment which allows you to wire your "stock" or "aftermarket" gauges and ignition systems. Special provisions have been made to allow you to install this harness into a fiberglass Jeep body adapted to the standard chassis.

Centech uses cross-link insulated copper wire in its harnesses. Cross-link wire has the ability to withstand incredible abuse from high temperatures, acid and abrasion and is found in only the newest vehicles. As a bonus, we have included many additional ground wires to compensate for the lack of a conventual "ground" found in non-conductive fiberglass bodies. These wires allow you to use the chassis as the "ground" system in place of the sheet metal. For additional reliability, we have included many wires soldered to their terminals to eliminate the possibility of poor electrical connections. Whenever possible, "Ring" terminals have been substituted for the old style Jeep "push-on" terminals. Ring terminals require a nut to hold them in place and are more reliable than simple push-on terminals.

Due to the many variations of engines, ignition and charging systems found in Jeeps, Centech has developed a method to allow you to customize each kit to your special requirements. Engine compartment wires which go to the engine and charging system have been made extra long and are labeled along their length to show their destinations. Special sleeves are included to protect each wire from abrasion. For example, there is a green wire labeled "oil" which connects the "oil pressure" sender to the oil pressure gauge. This wire must be cut to length, stripped, a piece of protective sleeving slipped over the wire, and a electrical terminal installed prior to connecting it to the sender. You have maximum flexibility when using this method. Excellent reliability is due to your using a modern electrical lug which gets bolted to the sender instead of being pushed on. Using our harness will allow you to wire the stock Jeep engine or do an engine conversion (Chevy V8s etc). **Of course, each kit comes with wiring for a modern Delco alternator that has a built-in regulator. This charging system is inexpensive and readily available. If you don't currently have the Delco alternator, you will need a change to the Delco charging system or you can elect to stay with your current alternator by modifying our alternator wiring.** Since you have decided to spent your valuable time and money to re-wire your Jeep, going one step further to install a modern charging system is a wise choice.

Many Jeeps use a Ford Motorcraft ignition system. This system includes an "ignition box", special distributor and coil which use a special "coil clip" connector. Unfortunetly, the Motorcraft coil terminals corrode and are certain to fail. The special coil "clip" is available from us to replace your present clip; however, your best bet is to replace the coil with a standard screw terminal ignition coil. A ballast resistor is included with each kit to allow you to adapt any ignition system (Ford electronic, points and others) to your new wiring harness. Kits for 1974 through 1977 which use the

CENTRAL GROUND BLOCK

An alternative method of providing a ground return is to run copper wire from each electrical unit back to a central junction block located near the battery. This method is especially effective when the builder desires to keep the frame intact by eliminating grounding points to mar the paint. This is accomplished by mounting a multiple contact terminal strip at a place next to the battery (-) post. A short, heavy (#10) wire is attached between the terminal strip common and the battery (-) post. All electrical components, with the exception of those mounted directly to the engine block, will have a ground wire run back to the terminal strip. The builder must keep in mind that these wires must be fairly heavy (#14 or heavier) to allow proper operation. Remember, the "ground return" wire must carry all the current which was used by the electrical units connected to this wire.

ENGINE GROUNDING

The heaviest current used by the electrical system goes to the starter motor. In fact, the current that goes to the starter is so high that it pulls the battery voltage down to in the neighborhood of 9 volts when cranking the engine. It is imperative that a heavy grounding strap connects the starter motor (engine) to the battery (-) terminal. The best possible way to make certain that the starter is getting maximum voltage is to connect the grounding strap directly from the battery post to the starter motor mounting bolt. Alternatively, a grounding strap can connect the battery post to the frame and then the frame can be connected to the starter via another heavy strap. Make certain that the connections to the frame are clean and well secured. Most hard starting and slow cranking problems are due to improper grounding which reduces the voltage available at the starter.

FIBREGLASS BODY CARS

As we all known, fibreglass is an insulator. That means that it doesn't conduct battery current. This makes the installation of many electrical items which normally get their ground through the case more difficult. What must be done is to use copper wire to attach each case to the battery (-) post. For example, many gauges use their case as a ground and expect to get grounded when bolted to the instrument panel or dash board. When mounted in a fibreglass dash no "ground return" current can flow and the gauges will not work properly. The best remedy is to purchase a wiring kit (Centech K30 or K31) which provides wires and terminals which connect each gauge case together and then returns to the battery (-) post.

needed battery wires and purchase them at your local automotive dealer. They are available in a variety of lengths and combinations. These wires are those which connect the battery (+) post to the starter solenoid. If you have a external starter solenoid (not attached to the starter motor itself), you will need to purchase the wire connecting the opposite solenoid post to the starter motor itself. Additionally, you will need another heavy wire to connect the battery (-) post to the chassis and to the engine block. It would be best to install a new starter solenoid at that time as well. **Remember, Jeeps which use a fiberglass body must make sure that the remotely located starter solenoid mounted on the fiberglass fender is grounded to the chassis.** This is done by running a wire from the solenoid housing to the chassis. Engines which have starter motors with built-in solenoids do not need an extra ground because the engine and starter solenoid will be grounded to the chassis upon installation. **An additional heavy strap would be a great benefit for connecting the battery (-) to the engine and frame.**

INSTRUMENT LAMP FUSE

Each kit provides a fuse to protect the wiring from the headlamp switch to your instrument lamps mounted on the dash. This fuse is a plastic in-line type located next to the headlamp switch. The fuse is sealed and waterproof. If there is a short in the lamps, this fuse will protect your headlamp switch.

GENERAL INSTRUCTIONS

1. Remove battery.
2. Unbolt stock firewall connector from firewall. Let hang.
3. Remove the entire front harness from the firewall connector forward to the engine and lamps.
4. Locate the bundle of wires which come from the rear of the Jeep through the body that connect to the dash harness near the firewall connector. Release the connector snap and pull the connectors apart to separate the rear harness from the dash harness. Remove the rear harness wiring from your Jeep by removing the rubber bulkhead grommet and pull it towards the rear through the body. Allow the rear harness to remain connected to the tail lamps and gas tank sender. Set it aside for now.
5. Remove the fasteners holding the steering column in place, then remove the screws holding the dash board to the cowling. Pull the dash towards you away from the cowl. Hold it in place with wire or cord.
6. Locate the wires which go from the heater switch to the heater fan motor or to the heater fan resistor (See Dash Board drawing). Pull the connector away from the heater fan switch.
7. Unscrew the AIR, TEMP and DEF controls from the dash to allow room to maneuver. Push these aside for now. Unscrew the speedometer cable from the rear of the housing.
8. Use figure 1 to identify each dash board switch and lamp to familiarize yourself with the original wiring. Note how these wires were routed. The connectors are designed so that in most cases, they can not be interchanged with another connector. Single pin connectors can sometimes be interchanged, but many are keyed to keep that from happening. Pay close attention to these single pin connectors attached to the wiper switch.
9. Carefully pull the wires and the lamps from the voltmeter and the oil pressure gauges. Put them aside.
10. Carefully remove the wires to the gauge cluster by pulling the rubber terminals away from the gauges. The lamp assemblies are removed by pulling them away from the rear of the cluster. Put them aside.
11. Remove the wiring to all of the switch indicator lamps. Pull the connectors away from each lamp. Move the wiring out of your way.
12. Unplug the connector from the headlamp switch and dimmer switch.
13. Unplug the connector(s) from the ignition switch. Older vehicles have a single connector coming from the dash mounted ignition; whereas, the late model Jeeps mount their ignition switch on the steering column between the dash and the firewall.
14. Unplug the connector from the turn signal switch wires. This connector is found just below the steering wheel. Older Jeeps have a six pin connector while the newer models have a long thin connector with numerous wires coming to it from the turn switch located just below the wheel. Disconnect and mark the individual horn button wire from the old style Jeep column.
15. Remove the connector from the wiper switch and the interior lamp which is attached to the lower left of the dash board.
16. Pull the firewall connector and fuse panel (if applicable) away from the fire wall.
17. Remove old dash harness assembly from vehicle.

Motorcraft Ignition system do not need to use a ballast resistor. 1978 and newer Motorcraft ignition systems use our 1.4 Ohm ballast resistor. It will be necessary for you to use the factory wiring with the Motorcraft system (see instructions for ignition systems on MotorCraft Instaalation sheet). Jeeps 1973 and older, use a points ignition system with a ballast. Use the ballast resistor supplied with your kit for these installations.

INSTALLATION HINTS

The most complicated area to rewire is the harness behind the dash. In reality, most dash board connectors are not interchangeable and can be installed only one way; therefore, you shouldn't be overly concerned. There are several wiring methods to ease your concern. One method to rewire the dash board with the least chance of making an error is to remove the dash and wires intact then simply unplug each old wiring connector and replace it with the new connector, one connector at a time. If you feel that you will not remember these connectors, you can mark each connector as it is removed. Alternatively, you could simply remove all dash wiring and use the photos to identify each connector. If you intend to rewire your Jeep but don't want to completely remove the dash board, your best bet would be to unbolt the steering column assembly and dash then move it away from the cowl so that it can be supported by several wires to hold it in place. Several connectors are plugged into the steering column connectors such as the turn-signal connector, horn etc. and may need to be removed first a to allow access to the remaining switches and connectors.

Later model vehicles (1976 up) have the ignition switch attached to the center of the steering column shaft, with the neutral safety and back-up switch located at the very bottom of the column near the floor. Stick shift cars need to have a jumper installed to bypass the neutral switch connector. Your kit has the jumper installed from the factory. For automatic transmission Jeeps, you will need to remove the jumper and push the neutral switch connector onto the neutral safety switch pins.

EXISTING WIRES

Many Jeeps will need to use some of the existing wiring due to the lack of availability of the original connectors. Wires from the Quadra-trac and a transmission mounted back-up lamp switch will snap into the new harness as required. The wires from the wiper motor to the wiper switch must be re-used in many applications.

GROUNDS

Additional ground wires will be found throughout the harness and will need to be attached to the chassis as required. See our enclosed paper titled **"All You Need To Know About Grounds"** for additional information.

GAUGES

Kits which are designed to work with the stock gauge cluster come complete with all lamps and wiring along with the necessary wires for the dash lamps which light the various switches and gauges. Kits designed to work with aftermarket or custom dashes contain extra long labeled wires to wire their new gauges, indicator lamps, and panel lamps. All that is needed is for the installer to read the label on the wire to identify its function then connect the wire as required to the its gauge or lamp. You will use the instructions which come with your new gauges to wire them to your harness.

WIRING REMOVAL

Since you are installing a completely new harness which includes an improved firewall connector, you will first need to remove the old harness. Since it is easier to install the dash harness when the dash board is out of the car, those of you who are installing a fiberglass body or who are using a new or restored dash should use Fig 1 to identify each dash switch and dash lamp.

For those who are just installing the new harness in place of the old harness and not replacing the body, you must first remove the harness from the front of the vehicle. This harness is attached to the firewall connector located at the upper right portion of the firewall.

Your kit **does not** include the heavy wiring between the battery and the starter solenoid / engine. Jeeps must have a good battery wiring system eliminate the "Hot Start" problems and will start easier in the cold as well. There are too many variations to allow us to supply these wires; however, after installing the main harness, take measurements of the

REAR HARNESS INSTALLATION

The rear harness contains the wiring for your tail and side lamps, stop/turn lamps, back-up lamps, license lamp and fuel tank sender unit. Additional "ground" wires have been included to ease the installation in fiberglass bodied Jeeps. Each lamp assembly needs a "ground" to work properly. The lamp "ground" is normally provided by the steel Jeep body; however, when using a fiberglass body you need to supply a "ground" because fiberglass is an insulator which doesn't carry battery current and will keep your lamps from working properly. We have provided an extra "ground" wire at each lamp assembly to supply the need "grounds". If you are re-wiring a steel body Jeep, there is no need to connect these ground wires; however, they could be used to add reliability to the steel body lamp wiring as well. We have provided new weather-proof for each lamp assemble. These connectors provide the ultimate in reliability for off-road applications. Each connector requires you to cut the existing lamp assembly wires and install new pins and connectors. Every wire is sealed to its housing and the housings are sealed to each other. Refer to Sealed Terminal Installation drawing on page 6 on how to install the new connector terminals to the wires. Solder is provided with each connector assembly.

1. Feed the seven pin flat connector of the new rear harness through the body opening towards the dash harness in the same position as the stock harness.
2. Secure the rubber grommet on the harness in the body opening.
3. Route the harness towards the rear of the Jeep and lay it in the original harness position.
4. Remove the fuel sender wire and replace it with the new pink fuel wire.
5. Remove the side lamps and replace them with the new holders and bulbs.
6. Cut the wires which come from the two stop lamp assemblies to equal length next to the rubber connector.
7. Locate the package of the weather proof connectors which came with the rear harness assembly. Attach a pin to each of the wires which come from each lamp assembly.
8. Push the following pins into the connector assembly.

FUNCTION	PIN LOCATION	STOCK COLOR
BACK-UP LAMP	PIN "A"	WHITE/BLACK
STOP LAMP	PIN "B"	GREEN
TAIL LAMP	PIN "C"	WHITE
GROUND	PIN "D"	(NA)

provide maximum versatility, many of the wires which are contained in the engine portion of the harness are labeled continuously along their length. This allows you to easily identify the destination or function of each wire. These wires are deliberately left extra long to allow you to cut them to length and then add the proper terminal. Each wire is dedicated to the engine gauge sending units, ignition system and charging system. Electric chokes are accommodated with a wire from the ignition switch. Special sleeves are provided to add extra protection against abrasion at the point where the wire exits the plastic tubing.

Each kit provides wiring for the DELCO alternator with a built-in regulator. These late 70's and newer alternators are available at low cost at nearly all automotive part stores. If you presently don't use the DELCO alternator, you will need to buy or construct a new alternator mounting bracket. Alternatively, you can modify the new harness to work with your present alternator. Each kit contains a resistance wire in the harness to provide a small amount of current to the Delco alternator to get it working right after the vehicle is started. This wire is normally connected directly to an ignition fuse; however, this wire can be used in conjunction with a "idiot" lamp to monitor alternator operation. Vehicles without "ALT" (idiot) lamps will connect this wire directly to an "ignition" fuse or if you have an idiot lamp, connect this wire to the metal portion of your lamp then connect the center lamp contact to the ignition fuse. This wiring places the idiot lamp in series with the resistance wire to the alternator. You will need to use a low current (approximately 85 milliampere) instrument lamp as the idiot light.

There are several wires going to the TCS, Quadra-Trac, brake warning, back-up switch (manual transmission) and kick-down (TH-400 automatic transmission) whose connectors are currently unavailable. You must use your existing connectors and wiring to wire to our harness. The connectors which mate to the original wiring are supplied in your kit are identical to the stock Jeep wiring that will plug into the new connectors. Splice if necessary.

There are two types of starter motors currently in use. One style used in many Jeeps consists of a starter motor bolted to the block that uses an external starter solenoid bolted to the inner fender panel. The second type uses a starter motor with a starter solenoid mounted on top of the starter motor. Both solenoids have two small posts. One marked "S" and the other either "I" or possibly "R". The "S" terminal post is wired to the ignition switch "START" terminal through the neutral safety switch (if applicable). The "I" or "R" post is used with ignition systems which use a ballast resistor such as some Motorcraft ignitions and standard "points" ignition systems. The purpose of this wire is to bypass the ballast resistor while the engine is being cranked so that full battery voltage is available to the ignition system at start. You must mount the new ballast resistor on the firewall to the left of the firewall bulkhead connector adaptor plate. The resistor is prewired for you. However, if you have an ignition system which does not need this resistor, move the upper blue wires (one marked "IGN+") down to the other terminal so that all three wires are on the same ballast resistor terminal. This will **eliminate the ballast resistor entirely.**

Special provisions have been made to use the metal firewall as a central ground. Fibreglass bodied cars need to use the chassis as the ground. See instructions below.

NOTE: Various engine wires are placed inside of a protective plastic conduit. It maybe necessary to remove one or more of these wires from the conduit and route it to its destination from a place along the conduit. In order to protect the wire's insulation at the place where it exits the conduit, you must slip a teflon sleeve over the wire and into the conduit. There is a package of sleeves with your kit for this purpose.

1. FIREWALL CONNECTOR

Push the engine compartment firewall connector into the connector mounted on the firewall. Use a 1/4" nut driver or socket wrench to tighten until it is completely sealed.

2. LAMPS

Locate the portion of the harness which goes to the headlamps, turn lamps and side lamps. Route this harness along the left fender in the stock position.

Plug in the connectors to the headlamps and turn lamps. Install the marker bulbs into the side lamp housings then snap the side lamps into their respective openings. Some harnesses contain auxiliary black "Ground" wires located near each lamp. Screw the ground into the sheet metal on stock bodied vehicles. Note: these wires only reach their intended destinations and will only plug in one way. There should be no doubt as to the proper place for each of the lamp connections; therefore, none of these wires are labeled.

with exhaust heated chokes do not use this wire and it can be discarded. However, if you have a carburetor with an electric choke, look to see if you have a oil pressure activated switch which is used in conjunction with the electric choke. This pressure switch is "closed" whenever the engine is running and there is sufficient oil pressure. You have the option to connect the red "choke" wire directly to the electric choke post or connect it first to either post of the oil pressure switch and use the remaining wire to connect the remaining switch post to the choke electrical post. Jeeps with engine modifications should connect the red wire directly to the electric choke.

12. EMISSIONS

Locate the green wire marked "TCS". Plug this into your "TCS" switch. On engines which do not have this device, this wire maybe discarded. Refer to you Jeep Shop Manual for additional information.

13. GAUGES

Find the bundle of labeled wires which are marked "OIL", "WATER" and "TACH". These wires are extra long and have no terminals attached. Each wires needs to be cut to length and have the proper terminal attached. This is especially helpful when installing a harness into a Jeep with an engine conversion. Identify each of your "sending" units then crimp on the type terminal required and solder. The green "OIL" wire goes to the sender tapped into the oil gallery while the "WATER" wire goes to the sender which is plumbed into the intake manifold water passage or cylinder head. Remember, your sender unit must be compatible with the gauge connected to it. Aftermarket gauges will usually require their complementary sending units. Stock gauges use the stock senders. The "TACH" wire is connected to the (-) post on your coil or could go to a special place on your aftermarket ignition system. Pull the TACH wire from the harness, slip a sleeve over the wire, cut to length and attach it. Make certain to push the protective sleeve into the plastic harness conduit. See the instructions which came with your tachometer.

14. ALTERNATOR

Each kit comes with the wiring for the **Delco Alternator** which contains an internal regulator. This alternator is found on many late model Jeeps and will be wired as is. Jeeps which presently have another charging system are urged to change over to the later model alternator. The Delco alternators are available in many current ratings and have been found to be plentiful and reliable. Mount your Delco alternator in its operating position. Fasten securely.

Locate the heavy red wire marked "ALTNR" with the large metal ring terminal and black protective boot coming from the end of the plastic conduit. Attached to this wire is a short red wire which is connected to a white two prong plug. The white plug also has a thin brown resistance wire coming from it. Plug the white connector into your Delco alternator side opening as required. It is keyed so that the connector will only enter one way. Remove the nut from the "BAT" post at the rear of the alternator. Push back the rubber boot on the "ALTNR" wire and place the ring terminal over the post. Replace the nut and gently tighten the terminal to the alternator. Push the boot over the post to protect the alternator from possible electrical damage. The "ALTNR" wire brings the "charge" current from the alternator to your battery. Since this is a very heavy wire, it can hold a lot of current; however, if there is a short to "ground" between the battery and the alternator "BAT" post this wire will be destroyed. To prevent that from happening, a "Fusible Link" has been provided to protect this wire. "Fusible Links" are basically, a very high current fuse. When too much current flows through the fuse link, it melts the wire inside to protect the main wiring from failure (We do not provide for the use of a "Ammeter" with our kits due to possibility of complete failure because of a burnt out meter). If you currently have a ammeter, we suggest that you replace your ammeter with a modern voltmeter as the factory has done. Additionally, you could install an "ALT" lamp to indicate a alternator failure as well (see special installation instructions).

To attach the red "ALTNR" wire, route the wire across the engine down to the starter solenoid. Find the large post on the starter solenoid which has the heavy battery wire from your battery (+) post attached. Once again, make certain that the battery is disconnected, then remove the nut holding the battery (+) cable to your solenoid post. Put it aside. Locate the package which contains the "ALTERNATOR FUSE LINK" then remove the "fuse link" from its package and note that the fuse link has one end with a heavy duty ring terminal and the other end has a heavy duty "butt" splice. Place the heavy ring terminal over the starter solenoid post then temporiarly replace the nut. Currently, there should be the heavy battery (+) wire and the fusible link on this post. Later you will add the main power feed wire to this post as well. You will need to attach the "ALTNR" wire to the "butt" connector on the fuse link. Cut the "ALTNR" wire to length, strip the insulation back approximately 3/8" and insert the bare wire into the yellow butt splice as far as possible (there should be NO bare wire showing). Use a quality crimping tool to fasten the wire to the butt splice. Make certain that your have a solid crimp by pulling on the wire and the fuse link to try to separate them. A firm tug shouldn't separate the red "ALTNR" wire from the fuse link.

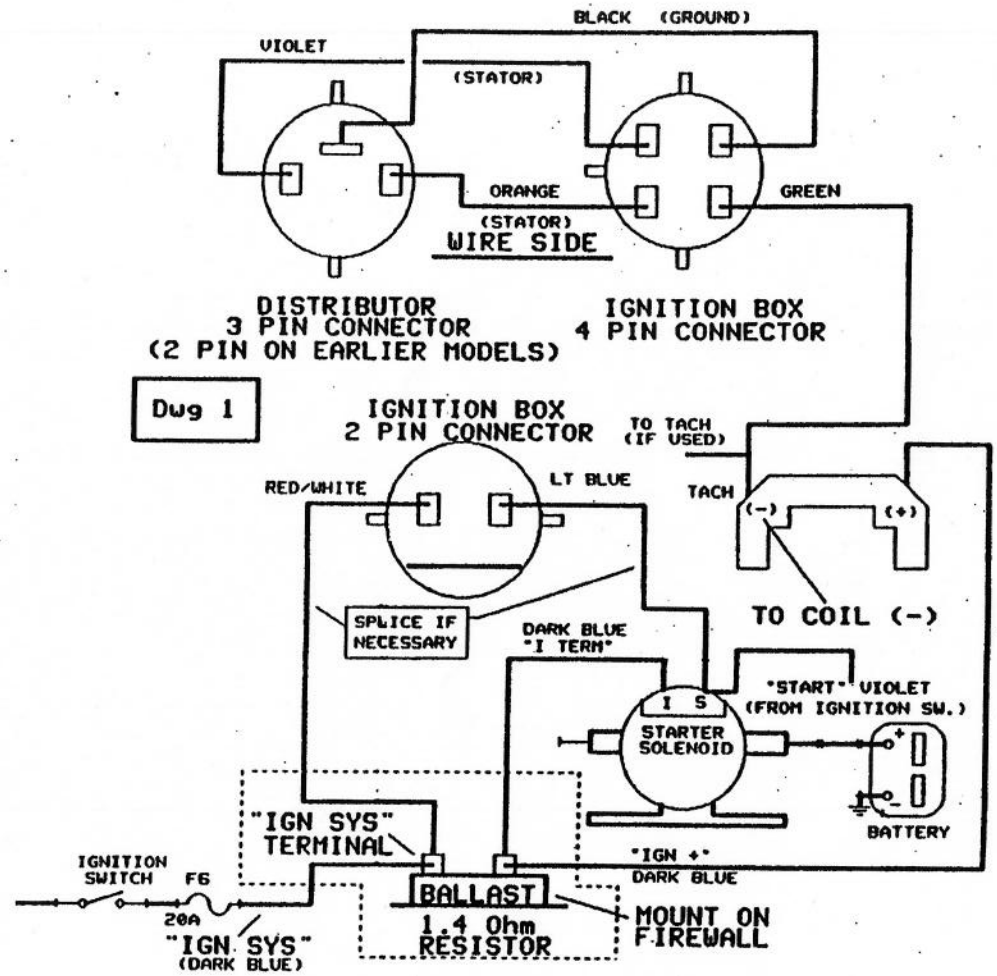
MOTORCRAFT (FORD) ELECTRONIC IGNITION

THE FORD IGNITION USES A SPECIAL ELECTRONIC BOX AND COIL. PLUS, MANY REQUIRE AN EXTERNAL BALLAST RESISTOR. IN MOST CASES, THE BALLAST RESISTOR COMES IN THE FORM OF A WIRE FROM THE IGNITION SWITCH TO THE COIL. FOR MAXMIUM FLEXIABLITY, WE USE A BALLAST RESISTOR UNIT WHICH MOUNTS ON ANY METAL SURFACE TO REMOVE HEAT.

IT WILL BE NECESSARY FOR YOU TO USE SOME OF THE EXISTING IGNITION BOX WIRES TO UTILIZE THE STOCK FORD IGNITION. FIND THE WIRING CONNECTING THE DISTRIBUTOR TO THE IGNITION BOX. THESE WIRES CONSIST OF THE THREE PIN CONNECTOR AND THE FOUR PIN CONNECTOR.(SEE Dwg 1) THERE WILL BE A SINGLE GREEN WIRE COMING FROM THE 4 PIN SOCKET WHICH GOES TO THE COIL (-) AND TACH AT THE HORSESHOE SHAPED COIL CONNECTOR.
PLUG THE THREE AND FOUR PIN SOCKETS BACK INTO THE IGNITION BOX. LOCATE THE 2 PIN IGN SOCKET WITH A BLUE AND A RED/WHITE WIRE GOING TO THE OLD BULKHEAD PLUG. CUT BOTH OF THESE WIRES AS CLOSE TO THE BULKHEAD CONNECTOR AS POSSIBLE. TEMPORIALLY CONNECT THE LIGHT BLUE WIRE TO THE "S" POST OF THE STARTER SOLENOID WITH A RING TERMINAL. LOCATE THE NEW VIOLET WIRE LABELED "START" COMING FROM THE NEW BULKHEAD HARNESS AND RUN IT UP TO THE "S" POST OF THE STARTER SOLENOID. CUT TO LENGTH AND CRIMP ON A #10 RING TERMINAL. FASTEN BOTH THE "START" WIRE AND THE FORD IGNITION WIRES TO THE "S" SECURELY WITH A 10-32 NUT. SEE DWG 1. ALTERNATIVELY, SPLICE THE LIGHT BLUE IGNITION BOX INTO THE VIOLET "START" WIRE IN THE NEW HARNESS.

MOUNT A 1.40 Ohm BALLAST RESISTOR ON A METAL SURFACE NEAR THE BULKHEAD PLUG. PLUG THE TWO PIN IGNITION PLUG BACK INTO THE BOX. BRING THE RED/WHITE LEAD OVER TO "IGN SYS" TERMINAL OF THE BALLAST RESISTOR. CUT TO LENGTH AND CRIMP ON A RING TERMINAL. SOLDER. LOCATE THE NEW DARK BLUE "IGN SYS" WIRE FROM THE HARNESS AND ATTACH IT AND THE RED/WHITE WIRE TO ONE TERMINAL OF THE BALLAST RESISTOR.

FIND THE DARK BLUE "IGN+" WIRE ATTACHED TO THE "I TERM" WIRE AND FASTEN THEM TO THE OTHER BALLAST RESISTOR TERMINAL. FASTEN IT SECURELY WITH A SCREW AND NUT TO THE POST. CONNECT THE "I TERM" WIRE TO THE STARTER SOLENOID TERMINAL "I" WITH A RING TERMINAL. SOLDER. LOCATE THE DARK BLUE "IGN+" WIRE FROM THE BALLAST RESISTOR AND CONNECT IT TO THE COIL (+) TERMINAL (USE A RING TERMINAL OR A NEW HORSESHOE CONNECTOR).



NOTE: WHEN USING A NON-STOCK COIL, ALWAYS BUY A A COIL WHICH USES A 1.4 Ohm BALLAST. AFTERMARKET COILS WITH POSTS WILL BE MORE RELIABLE THAN THE STOCK "HORSESHOE" COIL ASSEMBLIES. CENTECH CAN SUPPLY A NEW HORSESHOE CONNECTOR IF NECESSARY.

4	MORE INFO
3	MOVE RED/WHT WIRE TO "IGN SYS"

CENTECH INC.
PERKIOMENVILLE, PA.

ELECTRONIC IGNITION

JP-76/83

All 12 volt "points" ignitions require a ballast resistor for proper operation. Each kit provides a 1.40 Ohm ballast resistor. You must mount the ballast resistor near the firewall connector, keeping it away from flammable objects. If you are using an aftermarket ignition system, you maybe expected to provide a ballast resistor. The needed resistor may not be the same resistance as what is provided (1.4 Ohm) in this kit. You will need to substitute our resistor for the value (Ohms) required by the ignition system manufacturer. Resistors do not have polarity; therefore, the terminals many be swapped for convience.

1. POINTS

Attach the blue "IGN SYS" wire to the top terminal of the ballast resistor. Locate the long blue wire marked "IGN+" and the blue "I TERM" connected to one terminal located near the firewall connector. Attach these to the bottom terminal of the ballast resistor. Cut the IGN+ wire to length and connect it to the coil (+) terminal with a proper ring terminal. The coil (-) post goes to the distributor points/condenser wire. The "I TERM" wire from the ballast resistor gets connected to the starter motor solenoid "I" or "R" post. Use a ring terminal and solder.

2. HEI

HEI ignition systems do not need the ballast resistor. Bypass the ballast resistor by moving all three ring terminals to one resistor post. Connect the blue "IGN+" wire directly to distributor or use the shorter red "IGN2" wire, you need not bypass the ballast resistor. In either case, you will need to use the Centech HEI terminals. Cut wire to length, crimp on terminal then solder.

3. Early MotorCraft

Bypass ballast resistor as per step 2. Cut the blue "IGN+" wire to length and connect it to coil (+). Use the original wires from the ignition box to connect to the ignition coil. See sheet on MotorCraft ignition installation. Be sure to "ground" the ignition box securely to the frame.

4. Neutral Safety Switch (Automatic Transmissions)

Jeep with automatic transmissions use a switch located at the bottom of the steering column which allows the starter solenoid to be energized only when the vehicle is in "Park" or "Neutral". Remove the "BYPASS" Plug from the "Neutral Safety Connector" attached to the starter switch. Push the "Neutral Safety Connector" into the two pin neutral safety switch assembly at the bottom of the steering column. The connector is "keyed" to only fit one way. Stick Shift Jeepswithout neutral safety switches must keep the "BYPASS" in place.

SPECIAL CONSIDERATIONS FOR ENGINE CONVERSIONS

We have given much thought to those people who have done an engine conversion in their Jeep. Essentially, the engine harness must be constructed to allow for different types of starter motors, ignition systems and instruments. Additionally, you may need to consider whether to adapt the emission systems which came with the engine to your Jeep. We have elected to leave many of the engine compartment wires extra long to allow them to be properly connected to your new engine. Extra power wires have been added to assist with wiring emission solenoids. Special fuel injection engines need an additional electrical harness to connect the computer to the injection unit. This kit provides the power to run many of the fuel injection engines as well as late model Jeep engines which use a computer.

Pay special attention the wiring of the starter solenoid. For instance, If you were installing a General Motors engine which uses a starter motor with a built in starter solenoid in place of an AMC engine, you should remove the remote starter solenoid from the fender. Conversely, if you originally had a engine with a starter/solenoid combination but are changing over to a motor with a remotely located starter solenoid, you will need to purchase the remote solenoid along with new battery cable. Fibreglass bodied Jeeps will need to have the remote starter solenoid case grounded to the chassis.

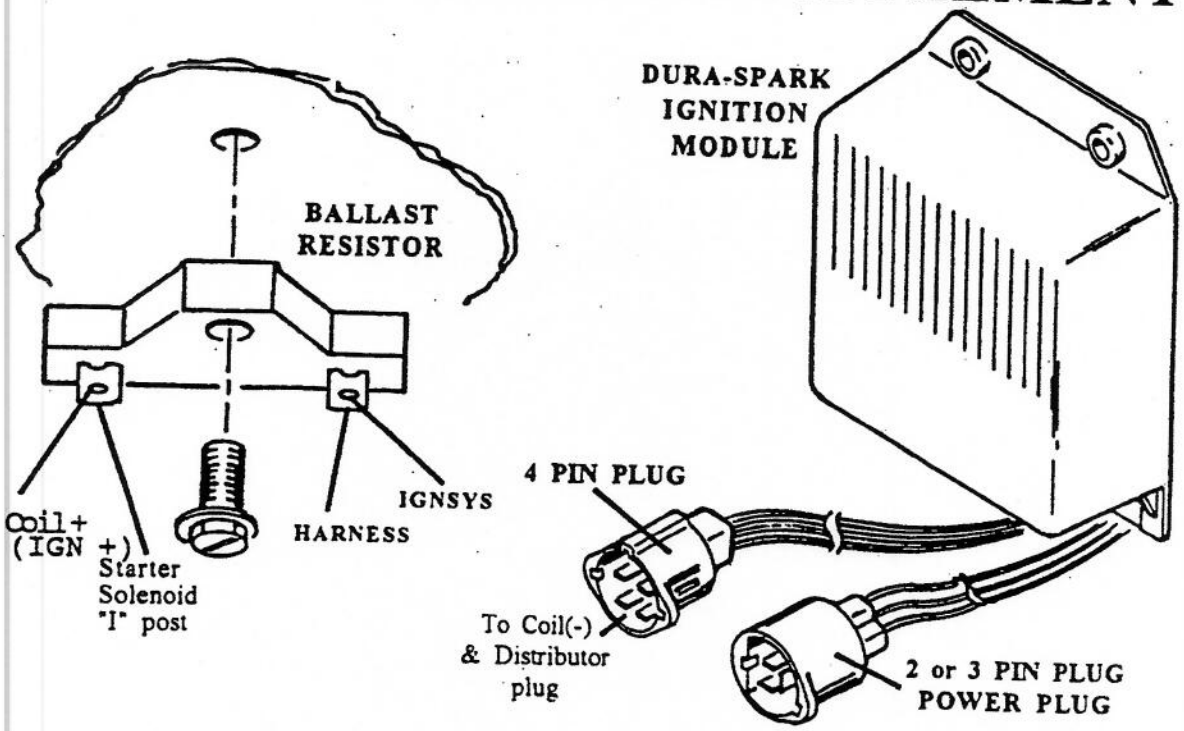
Aftermarket ignition systems vary from manufacturer to manufacturer but every one of them requires battery power, a ground, plus wiring from the distributor to the ignition box and from the coil to the box. General Motors HEI ignitions feature internal wiring to connect the ignition box to the coil and the sensor but still need battery power and a ground. Distributor ground is made when the distributor is clamped to the engine. Ignition box grounding maybe accomplished via a wire or through the metal box itself. When the ignition box is grounded by a wire, you can mount the box on a fibreglass fender or whatever but please note that the ignition system manufacturer may have added additional cooling to the ignition box by asking you to mount it in a cool spot or on a metal surface to remove excess heat. Heat destroys electrical units such as ignition systems so try to mount your system away from the exhaust manifold and pipes.

Power from the "I" post of the fuel gauge goes through the thermostat switch inside the fuel gauge to the center post. An electrical strap connects the center post of the fuel gauge to the input post of the temperature gauge. Current flows through the bi-metal bar heater inside the gauge down through the sender unit to ground. The lower the sender resistance, the more current flows through the heater element bending the bar to move the point towards the "H" (hot).

TROUBLE SHOOTING GAUGE PROBLEMS

1. Make certain that the instrument cluster is grounded.
2. Be sure you have power to the "I" post on the fuel gauge at the rear of the cluster. Check fuse and wiring.
3. Determine that the strap which connects the gauges is not touching ground. Use an Ohmmeter. The lock washers should go between the strap and the nut and must not be grounded.
4. Check the wiring from the sending units to the gauge "S" post. It should not be shorted to the cluster, chassis, body or frame but will show a resistance to ground. Use your ohmmeter to check for proper sender operation.
5. Use a test lamp or voltmeter to determine if the center post on the fuel gauge is pulsing. Failure to pulse indicates a faulty gauge.
6. Gauge inaccuracy can be due to improper "pulsing" of the fuel gauge or faulty or non-stock sending units.

IGNITION SYSTEM SUPPLEMENT

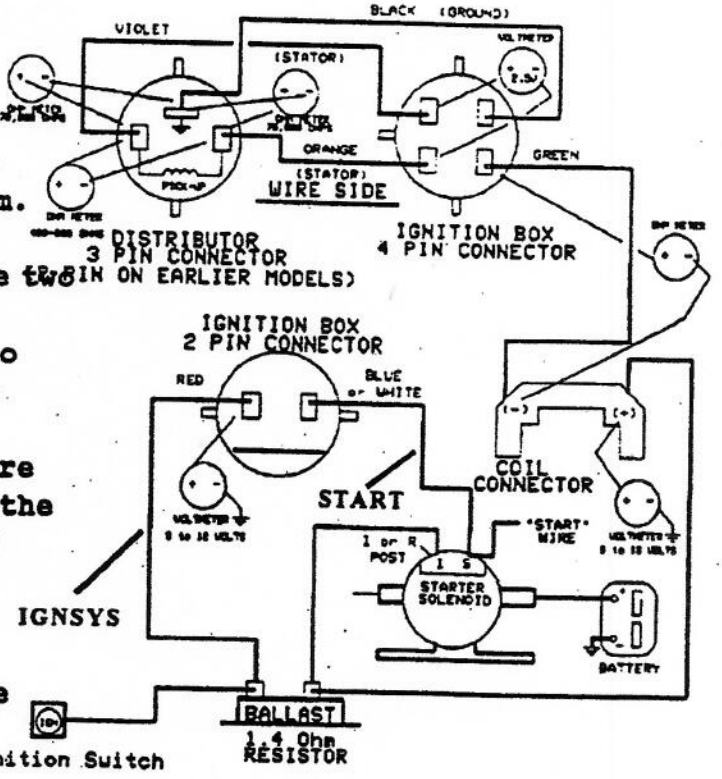


IGNITION BOX POWER WIRING

Your engine harness includes several additional wires to help connect the engine wiring harness to your Dura-Spark Ignition System. These wires come from near the ballast resistor and attach to the two or three wire power plug from the ignition box. Splice these wires to your ignition box wires as follows:

1. Connect the violet "START" wire from near the ballast resistor to the ignition box WHITE or LIGHT BLUE coming from the 2 or 3 pin power plug.

2. Connect the blue "IGNSYS" wire to the RED wire from the same ignition box plug.



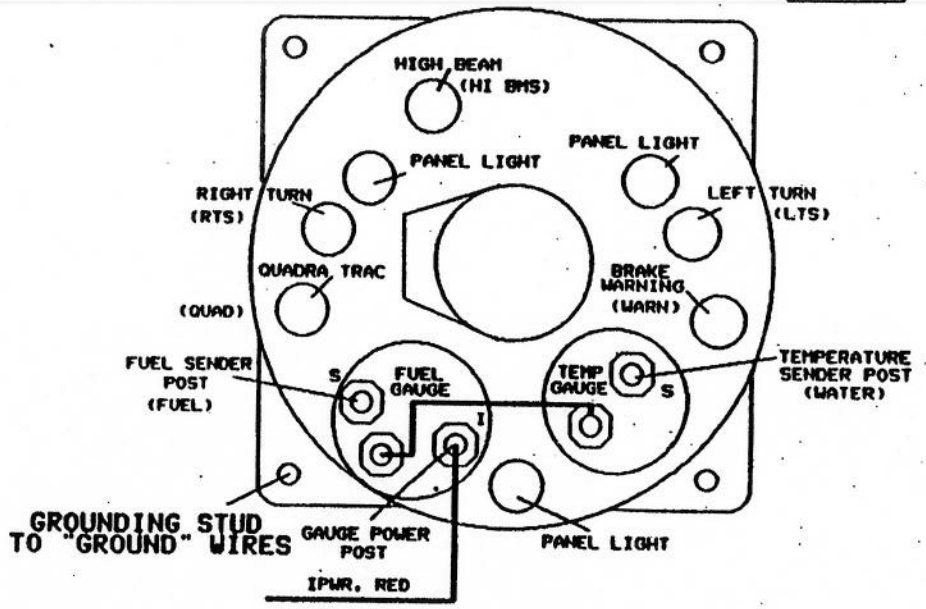
GAUGE CLUSTER AND REMOTE GAUGE WIRING

1. FIND THE GAUGE CLUSTER IN THE MIDDLE OF YOUR STOCK DASH. THE CLUSTER CONTAINS THE SPEEDOMETER, FUEL AND WATER TEMPERATURE GAUGES, TURN SIGNAL INDICATORS, HIGH BEAM INDICATOR, BRAKE WARNING LAMP, QUADRA-TRAC LAMP AND GAUGE PANEL LAMPS.
2. TO THE LEFT OF THE CLUSTER ARE THE TWO REMOTE GAUGES. A VOLTMETER AND AN OIL PRESSURE GAUGE. SEE Fig 2.
3. REMOVE ALL THE WIRES GOING TO THE CLUSTER AND THE REMOTE GAUGES. REMOVE THE LAMPS FROM THEIR SOCKETS BY PULLING THEM TOWARDS YOU OR BY USING A SMALL SCREW DRIVER TO PRY THEM FROM THEIR OPENINGS. REMOVE THE GAUGE WIRES BY PULLING AND TWISTING THE RUBBER TERMINALS FROM THE GAUGE POSTS. REPLACE THE CLUSTER AT THIS TIME IF IT IS DEFECTIVE.
4. BRING THE GROUP OF GAUGE WIRES CONTAINING THE PANEL LAMPS UP TO THE CLUSTER. LOCATE THE "RTS", "LTS" AND "HI BMS" LAMPS. THESE LAMPS ARE IDENTIFIED BY THE MARKINGS ON THEIR WIRES. SNAP EACH LAMP ("LAMPS", ORANGE) INTO ITS OPENING AS PER Fig 1.
5. IDENTIFY THE BRAKE WARNING AND THE QUADRA-TRAC LAMPS BY THEIR WIRE MARKINGS. SNAP THEM INTO THEIR OPENINGS AS PER Fig 1.
6. USE Fig 1. TO ATTACH THE REMAINING WIRES TO THE CLUSTER. USE THE 10-32 NUTS PROVIDED TO FASTEN THE RING TERMINALS TO THE GAUGE POSTS.
7. LOCATE THE AUXILARY HARNESS COMING FROM THE WIRING TO THE GAUGE CLUSTER OVER TO THE REMOTE GAUGES.
8. CONNECT THE REMOTE WIRING AS PER Fig 2 TO THE REMOTE GAUGES. USE #10-32 NUTS TO FASTEN THE RING TERMINALS TO THE GAUGE POSTS. SNAP IN THE LAMPS. THE "GND" TERMINAL ON THE VOLTMETER MUST BE CONNECTED TO THE CENTER "GND" TERMINAL OF THE OIL PRESSURE GAUGE. REPLACE DAMAGED GAUGES AT THIS TIME.

NOTE: USE THE CLUSTER MOUNTING STUDS AS "GROUND" POSTS BY PLACE THE GROUND RING TERMINALS UNDER THE CLUSTER RETAINING NUTS. SEE Fig 1.

CLUSTER
(REAR VIEW)

Fig 1



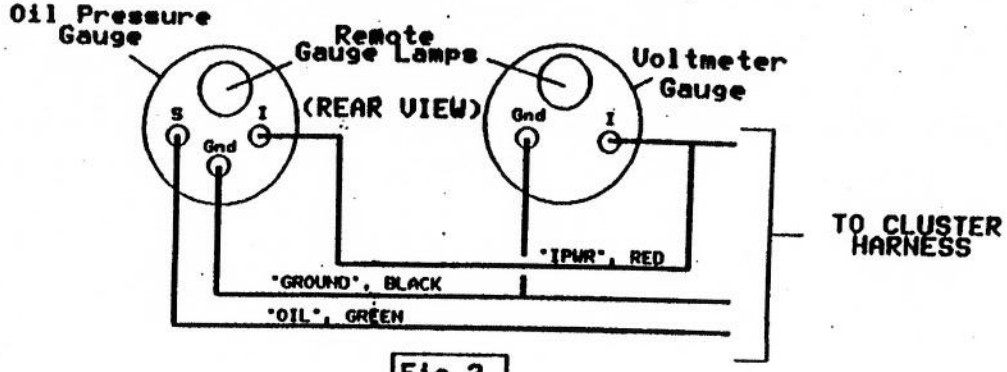
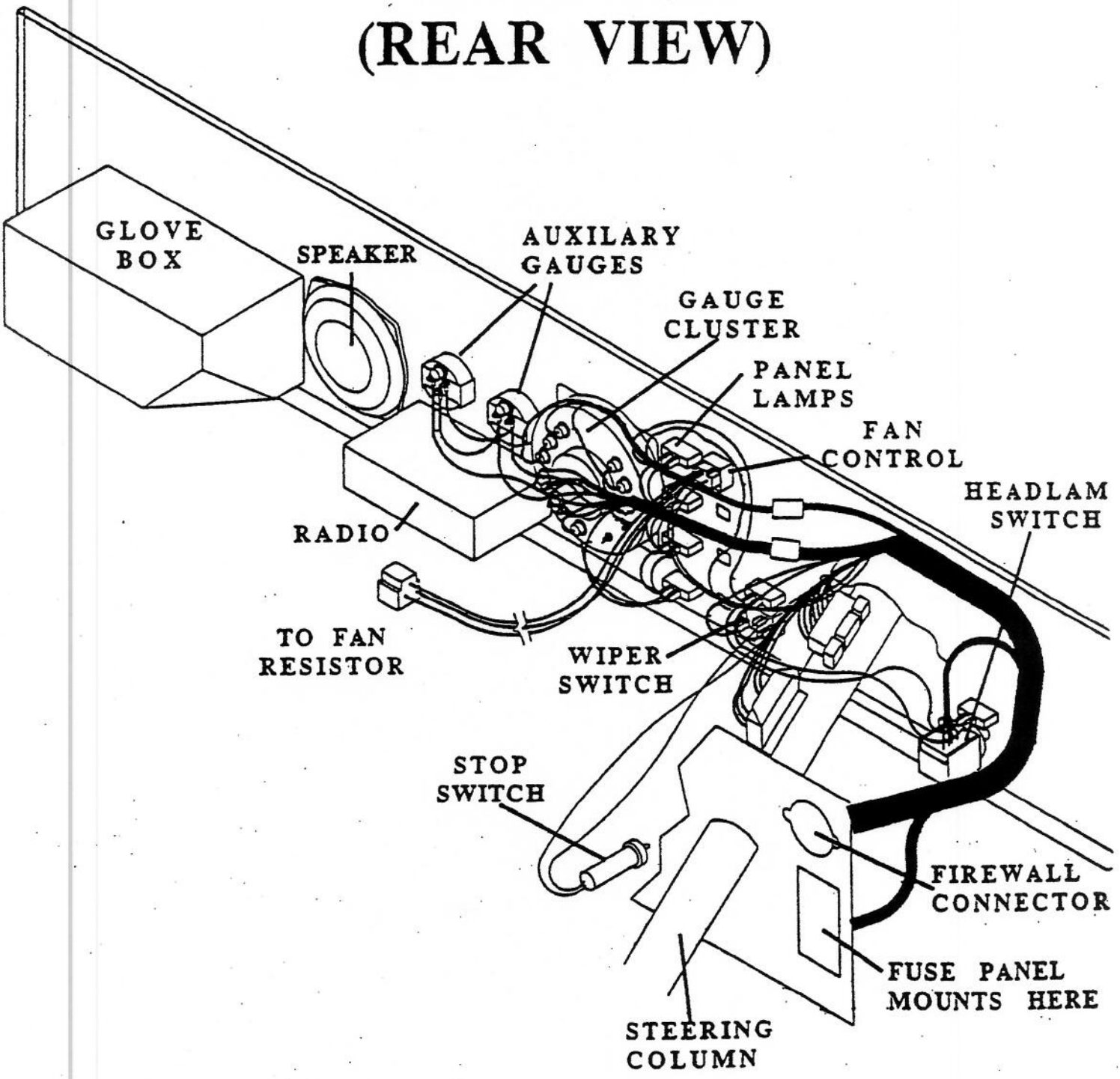


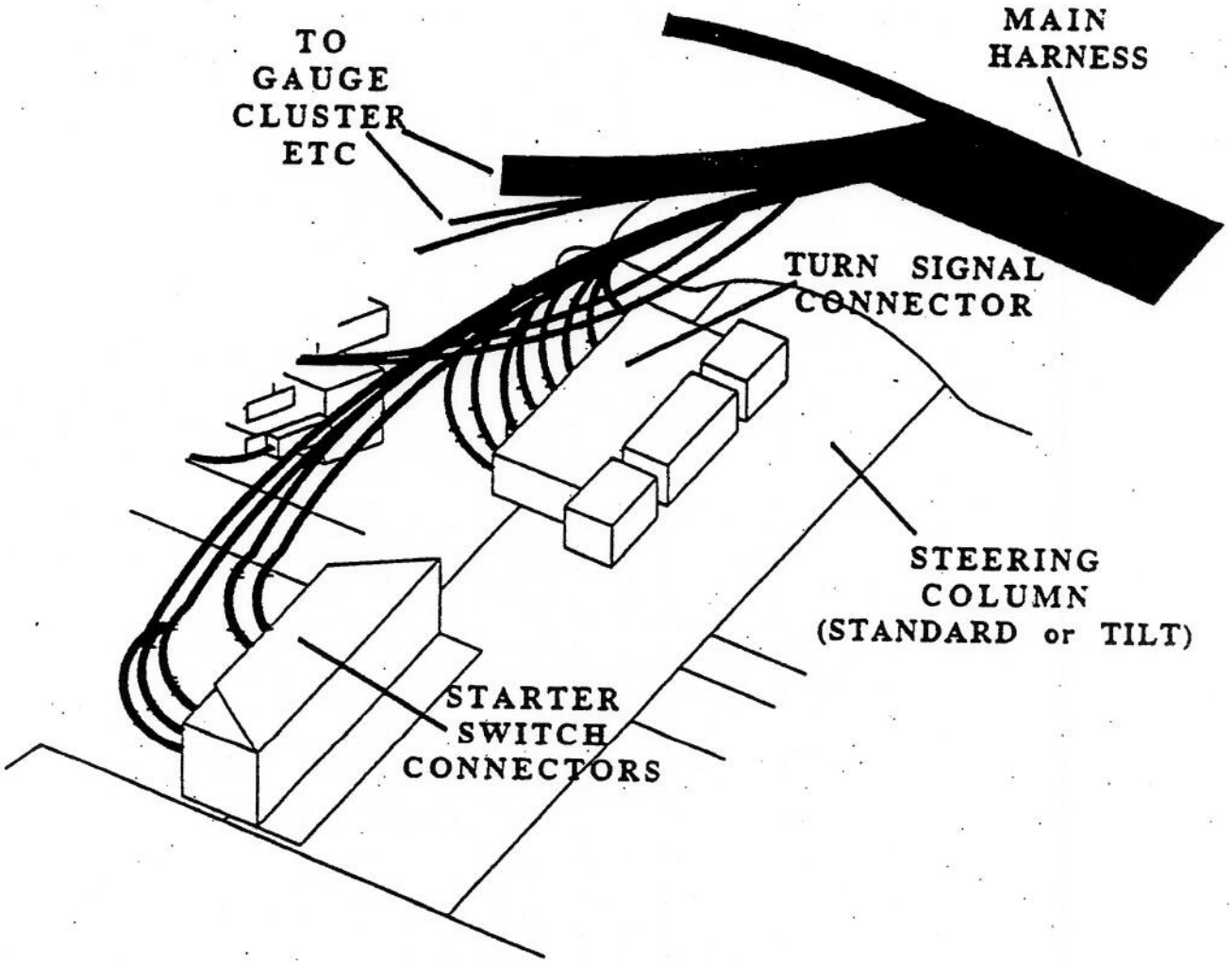
Fig 2

CENTECH INC. PERKIOMENVILLE, PA.		
STOCK GAUGE WIRING		
JRS	SPECIAL	REV 0

DASH BOARD
(REAR VIEW)

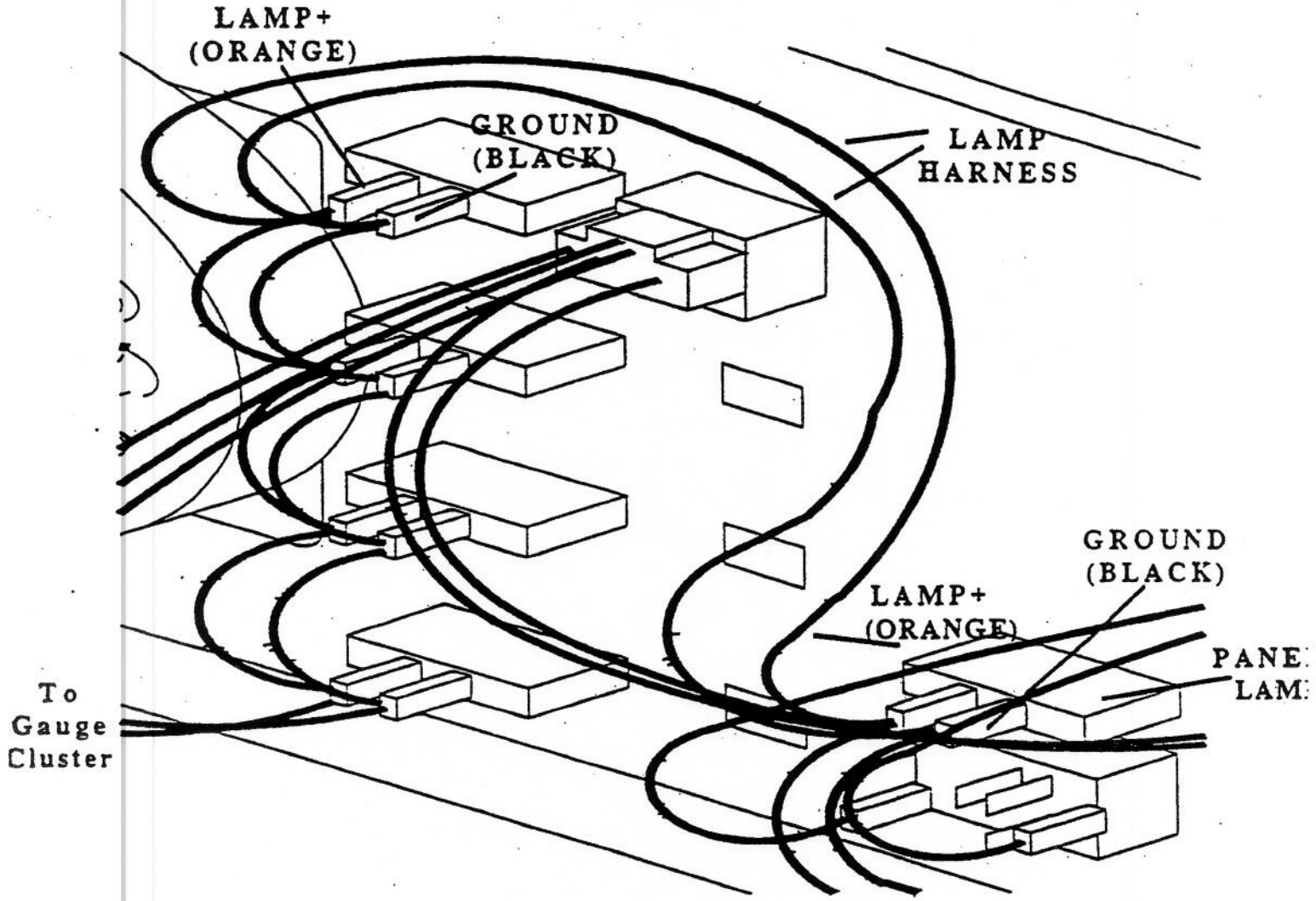


1976 and LATER STEERING COLUMNS



Note: The starter switch uses two separate connectors. One clear and one black. They can only be inserted into the switch one way. The clear plug is pressed on first and the black plug goes second.

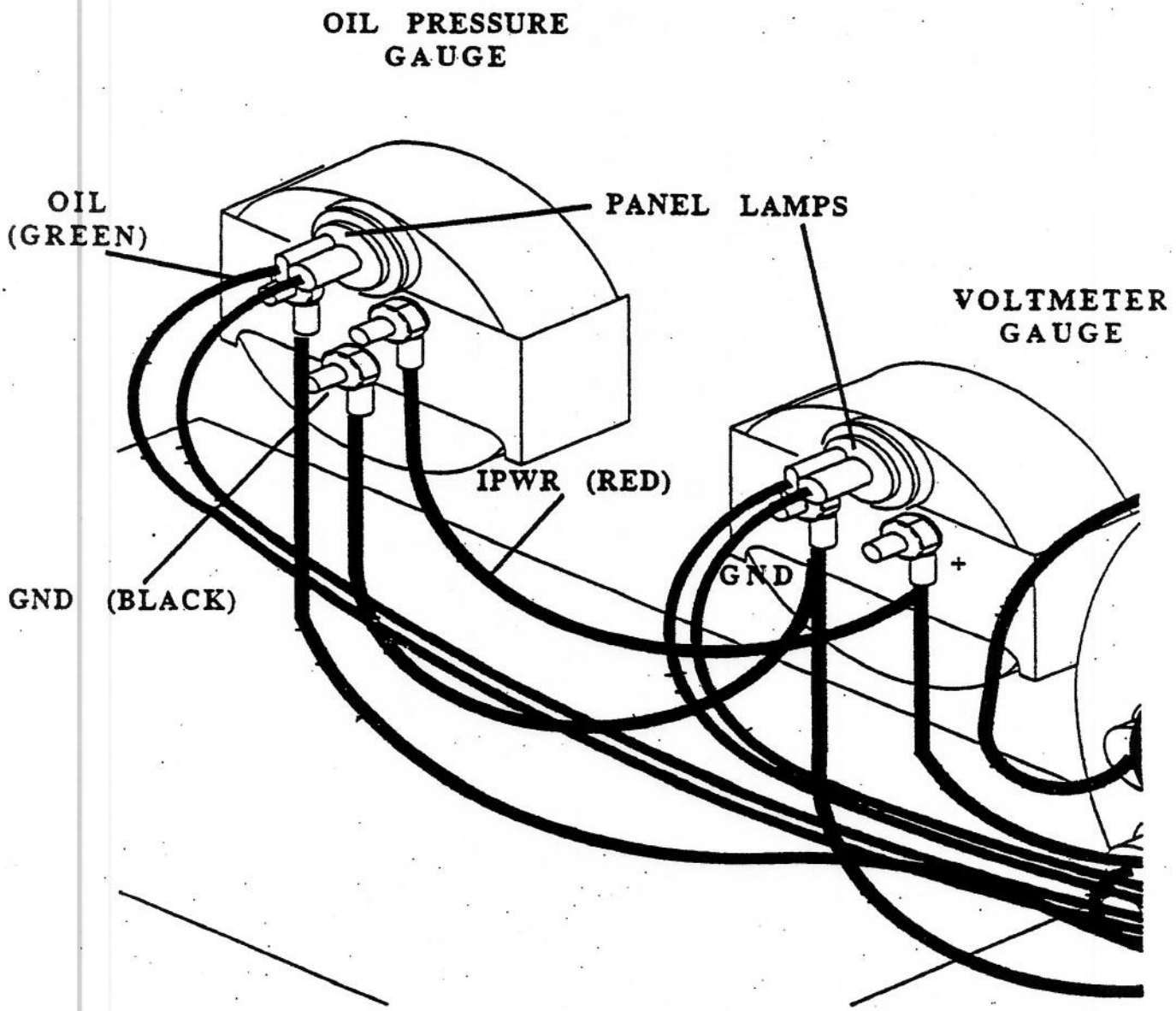
FIG 3



PANEL LAMP WIRING
(STOCK)

FIG 2

AUXILARY GAUGE WIRING



Note: The yellow "TACH" wire goes to the sender input terminal of your tach. Power to the tachometer comes from the IPWR and GND terminals of your auxilary gauges.

FIG 1

HEADLAMP SWITCH WIRING

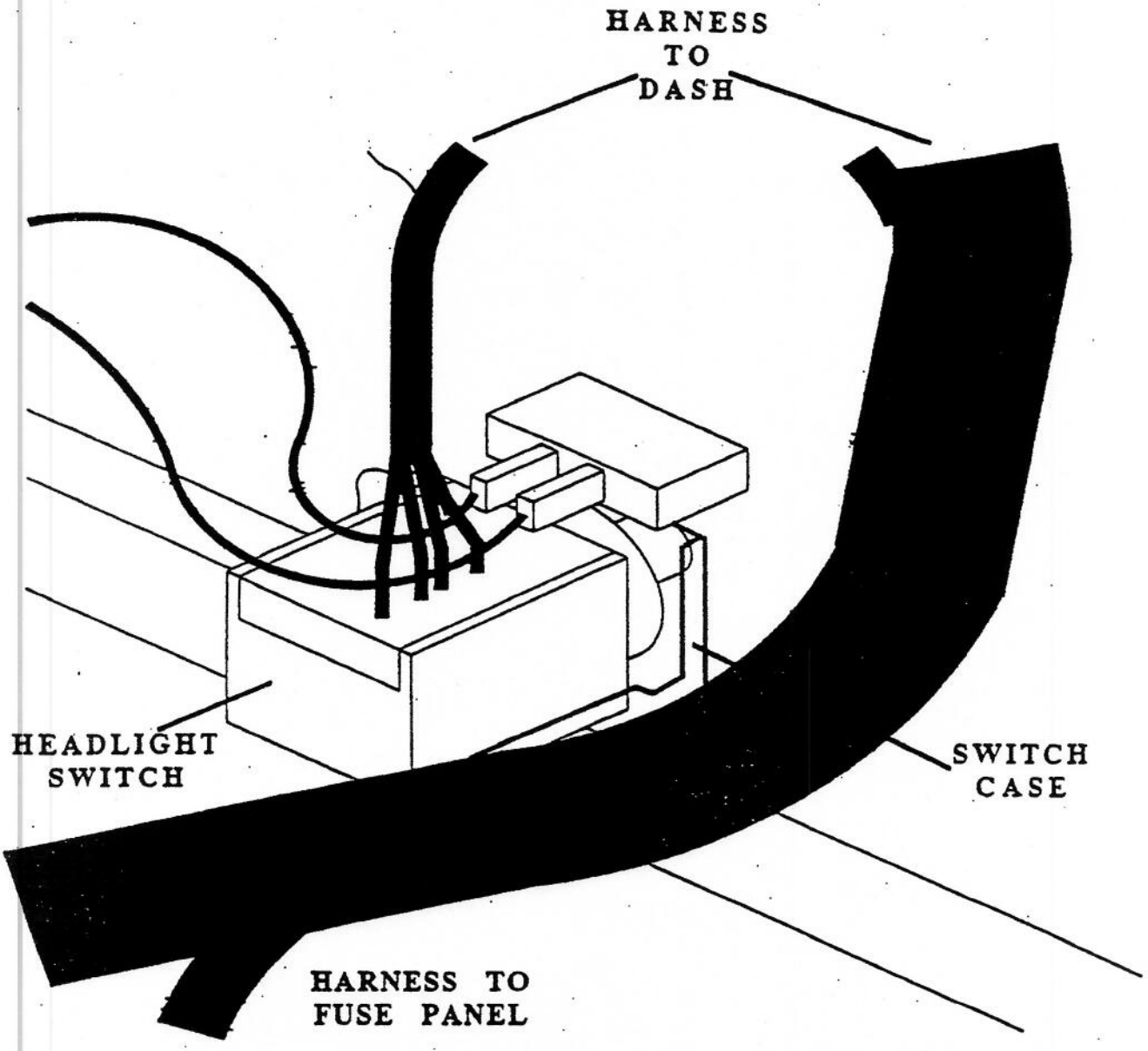


FIG 4

Note: To remove your original switch connector, open connector locks on both sides of the plastic connector housing by prying them away from the switch while ~~pulling the connector housing away from the switch~~. To replace switch, remove the knob by placeing the switch in the headlamp "ON" position, then depressing the release button on the bottom of the switch to disengage switch shaft. Pull shaft away. ***Switch housing must be grounded in fiberglass dashes to allow the interior lamps to be operated by the headlamp switch.***

JEEP GAUGE CLUSTER NOTES

The standard gauge cluster containing the fuel and the water temperature gauges does not operate in a conventional manner. Each gauge is essentially a thermal device which works much the same as a electric carburetor choke. When electrical current is applied to a choke, a bi-metal element heats to open the choke plate. When current is applied to a Jeep gauge, a bar bends to move the pointer.

With the Jeep gauges, electrical current heats an element, much like a toaster wire, heating an adjacent bar forcing the bar to bend. This bar is connected to a mechanical linkage which, when the bar bends, moves the gauge pointer. There is an additional device located within the Fuel Gauge which feeds power to both the fuel pointer and to the temperature pointer. This device functions in the same manner as above. However, when the bar is cold, it completes a circuit which supplies electrical power to the fuel pointer and to the temperature gauge via the strap which connects the two gauges at the rear of the gauge cluster. When the bar element heats, power is interrupted to the gauges. The element is heated when power is applied to the "I" post on the fuel gauge. This thermostatic switch continuously makes and breaks power to both gauges. This protects the gauges from overload and seems to be necessary to maintain gauge accuracy as well.

FUEL GAUGE

Your fuel gauge functions when electrical power is applied to the "I" (ignition) terminal and the gauge "S" post is connected to the "Fuel Sender" located in the fuel tank. The sender unit is a variable resistor controlled by a float. The float rides on top of the fuel and is connected via a linkage to vary the amount of resistance connected between the fuel gauge "S" post and ground. The sender resistance varies from approximately 10 Ohms to 60 Ohms.

When the fuel sender resistance is low, more current flows through the fuel gauge element to heat the bar forcing the pointer towards the Full mark on the gauge. Excessive current will damage the gauge if the thermostat cutoff element is not functioning properly.

TEMP GAUGE

The temperature gauge operates in much the same manner as the fuel gauge. However, the temperature gauge gets its power from the fuel gauge center post with current flowing to the temperature sender unit through the temperature gauge. Your temperature sender is located somewhere in the engine coolant passage and is connected to the "S" post on the temperature gauge. The amount of resistance of the temperature sender varies with the coolant temperature.

You must follow the instructions from the manufacturer of the ignition system as to how to connect power to the box and to wire up the distributor. See paragraph concerning BALLAST RESISTORS in the ignition section of this booklet.

SPECIAL CONSIDERATIONS FOR AFTERMARKET INSTRUMENTS

Aftermarket gauges and indicator lamps can be handled in several ways. If you intend to install additional gauges such as a tachometer or oil temperature, you could use much of the standard underdash harness by adding a wire or two. If you have modified the dash extensively or plan to use individual gauges in place of the stock gauge cluster, Centech can supply a special harness adaptor which plugs into the standard underdash gauge cluster connector. Contact the factory for additional information on this special kit.

SPECIAL CONSIDERATIONS FOR FIBERGLASS BODIES

Fibreglass bodied Jeeps need special grounding consideration. **Fibreglass does not carry electrical current.** All electrical devices work on the principle that electrical current must flow through the electrical device to allow it to work. This means that each electrical device, whether it is a lamp or a motor etc., has at least two electrical connections and many use their metal cases as one of these terminals. One terminal allows the current to flow into the unit while the second terminal allow the current to escape. Fibreglass does not provide a ground path for an electrical device which uses its case as a ground.

Many Jeeps have new fibreglass bodies but use the original steel dash board. This steel dash is a good ground. In a stock Jeep, the dash provides a ground for the gauge cluster as well as the courtesy lamps controlled by the headlamp switch. The headlamp switch, when turned fully counter-clockwise, grounds the metal case of the courtesy lamps. The center pin of the lamps is connected to the battery via a fuse. When the headlamp switch grounds the lamp case, current flows through the lamp. Fibreglass Jeeps which have steel dashes need to have their dash boards grounded to the chassis because the steel dash is used as a ground when it is bolted to the steel Jeep body.

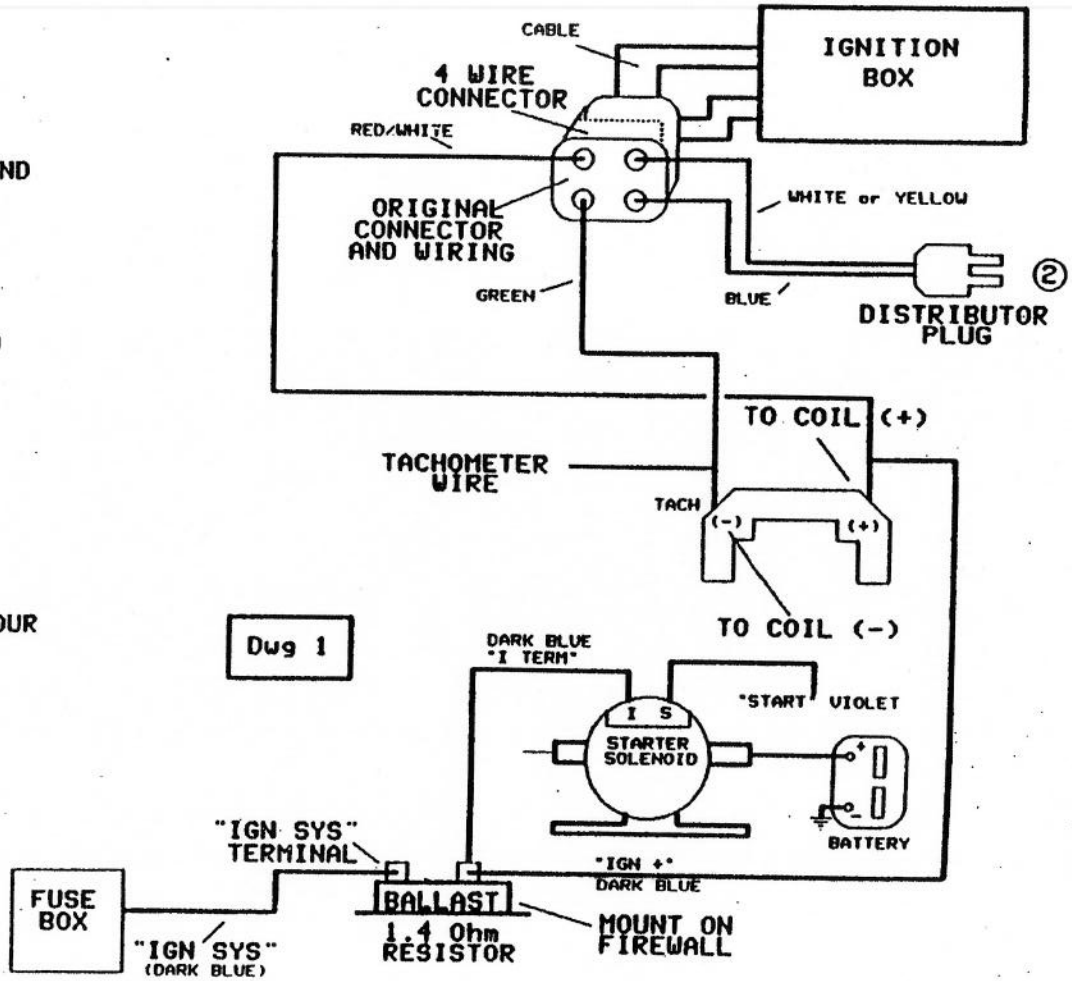
EARLY ELECTRONIC IGNITION

THE IGNITION SYSTEM USES A SPECIAL ELECTRONIC BOX AND COIL THAT REQUIRES AN EXTERNAL BALLAST RESISTOR. IN MOST CASES, THE BALLAST RESISTOR COMES IN THE FORM OF A WIRE FROM THE IGNITION SWITCH TO THE COIL. FOR MAXMIUM FLEXIABLITY, WE USE A BALLAST RESISTOR UNIT WHICH MOUNTS ON ANY METAL SURFACE TO REMOVE HEAT.

IT WILL BE NECESSARY FOR YOU TO USE SOME OF THE EXISTING IGNITION BOX WIRES TO UTILIZE THE STOCK FORD IGNITION. FIND THE WIRING CONNECTING THE DISTRIBUTOR TO THE IGNITION BOX. THESE WIRES CONSIST OF THE BLUE AND WHITE OR YELLOW WIRES GOING TO THE STOCK ② DISTRIBUTOR PLUG. ALSO LOCATE THE RED/WHITE AND THE GREEN WIRES FROM THE IGNITION BOX CONNECTOR.

INSTALLATION

1. PLUG THE ORGINAL CONNECTOR INTO THE IGNITION BOX AND PLUG THE ORIGINAL DISTRIBUTOR CABLE FROM THE FOUR WIRE CONNECTOR INTO THE DISTRIBUTOR CONNECTOR.
2. LOCATE THE GREEN WIRE COMING FROM THE FOUR WIRE CONNECTOR AND CONNECT IT TO THE COIL (-) TERMINAL WITH A RING TERMINAL. SOLDER.
3. LOCATE THE RED/WHITE WIRE FROM THE CONNECTOR AND CONNECT IT TO THE COIL (+) TERMINAL. USE A RING TERMINAL. SOLDER.
4. CONNECT THE BLUE "IGN +" WIRE COMING FROM THE BALLAST RESISTOR TO THE COIL (+). USE A RING TERMINAL. SOLDER. NOTE: THERE ARE TWO WIRES GOING TO THE COIL (+) TERMINAL POST.
5. CONNECT THE "I TERM" WIRE FROM THE BALLAST RESISTOR TO THE "I" TERMINAL ON THE STARTER SOLENOID.



NOTE: WHEN USING A NON-STOCK COIL, ALWAYS BUY A A COIL WHICH USES A 1.4 Ohm BALLAST. AFTERMARKET COILS WITH POSTS WILL BE MORE RELIABLE THAN THE STOCK "HORSESHOE" COIL ASSEMBLIES. CENTECH CAN SUPPLY A NEW HORSESHOE CONNECTOR IF NECESSARY.

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76-77 IGNITION SYSTEM

15. FAN MOTOR

Locate the tan "FAN" wire from the firewall harness. Push this connector onto the fan motor electrical terminal found below the battery. Remember, you must "ground" the fan motor housing (case). If you have a fibreglass body, use the black ground wire which originally attached between the fan motor and the firewall to connect the motor housing to the frame. Add a ground wire if your wire is missing.

16. MAIN POWER FEED

Locate the heavy red wire marked "BATTERY" along it's length. This wire feeds battery power from the starter solenoid battery post to the fuse panel inside your Jeep. One end of the "BATTERY" wire has a high current fusible link attached to a heavy duty ring terminal lug. Attach this lug to the place where you've attached the red "ALTNR" wire from the alternator. Tighten securely.

Locate the package containing the POWER FITTING. This device is used to pass the main power wire through the firewall to your fuse panel. It contains a rubber grommet which is tightened around the wire to seal it against moisture etc.

Run the main power wire (BATTERY) from the starter solenoid to a point just below the new firewall connector. Locate an area which is clear from obstructions, then drill or punch a 5/8" opening through the firewall into the passenger compartment. Remove the retaining nut, then place the plastic fitting through the opening from the firewall side. Attach the plastic retaining nut on the passenger side of the fitting. Tighten gently.

Push the BATTERY wire through the opening of the fitting into the passenger compartment. Route the wire along the firewall then tighten the outer gland nut on the plastic fitting to seal the BATTERY wire to the fitting. Pull gently on the wire to make sure that it is securely sealed. Continue to tighten the gland nut as required if the wire moves back and forth within the fitting.

The BATTERY wire is connected to the "BAT" terminal on the fuse panel. See instructions concerning FUSE PANEL.

IGNITION SYSTEMS

Locate the present "ignition" box and determine the manufacturer. Most Jeeps have the MotorCraft Ignition System which consists of the ignition box, a coil and resistance wire used as the ballast resistor. We do not supply replacement wires for the MotorCraft Ignition Systems. You will need to reuse many of your present wires which connect the ignition box to the coil and vehicle. The MotorCraft ignition coil uses a special connector clip to attach the coil to the ignition box. The coil terminals frequently corrode and make the operation of the ignition system unreliable. We suggest that you replace the MotorCraft coil with a new MotorCraft coil which features standard electrical posts (threaded) for the (+) and (-) terminals.

MotorCraft Electronic Ignition units from 1972 through 1977 do not incorporate a ballast resistor. Basically, the ballast resistor is built into the ignition box and does not require the external resistance wire. Newer Jeeps use a resistance wire as a ballast resistor. Your kit contains a separate 1.4 Ohm ballast resistor and no resistance wire for the ignition.

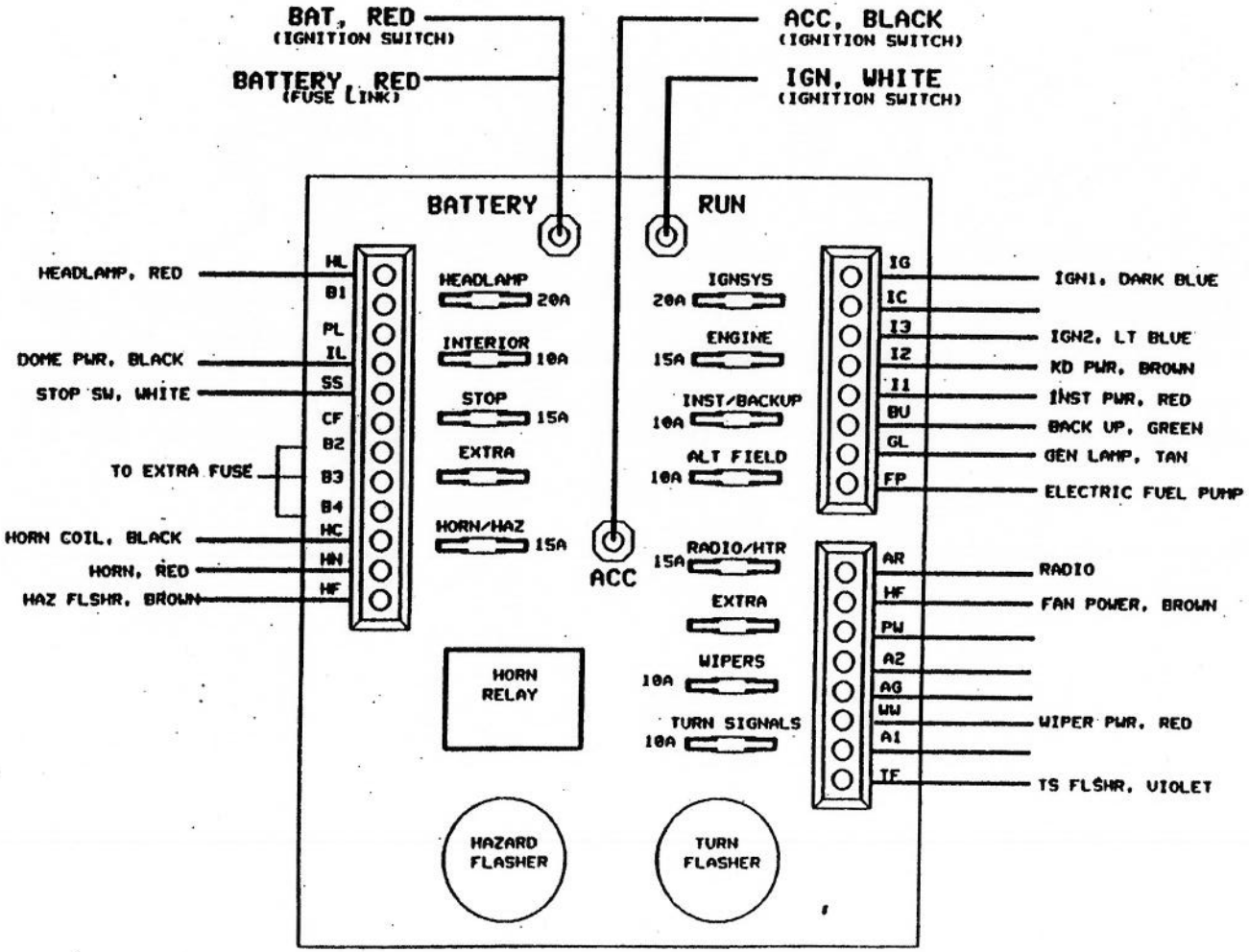
Aftermarket ignition systems often require a ballast resistor. We provide an external ballast resistor mounted on the firewall to allow for maximum flexibility with these systems.

General Motors High Energy Ignitions (HEI) use a special connector which snaps into the side of the distributor unit. You will need to attach an electrical terminal and the brown plastic housing to the ignition (IGN+) wire. HEI ignition systems do not use a ballast resistor. Additionally, HEI distributors have a special "TACH" terminal. You must connect the special white plastic tach connector to the yellow "TACH" wire if you intend to operate a tachometer in your Jeep. Depending on your specific installation, you can use the red "IGN2" or the Blue "IGN+" wire with the ballast resistor bypassed to supply ignition voltage to your HEI distributor. Be sure to use the solder included in the HEI connector package.

Ballast resistors or resistance wire is used to drop the normal battery voltage (approximately 13.5 volts) down to the range of nine volts at the coil during normal running. This is done to keep the ignition system (points, box etc.) from overheating while providing a way to have the full coil voltage available during cranking when the battery voltage is low (around 9.5 volts). Starter solenoids are constructed so that when they are energized (engine is cranking) the "I" (sometimes "R") post is connected electrically to the battery (+) post. This post, in turn, must be wired to the coil (+) terminal. This kit connects the solenoid "I" post to the side of the ballast resistor which goes to the coil (+) via the "I TERM" wire.

USE EXTRA FUSES AND TERMINALS FOR ADDITIONAL ELECTRICAL NEEDS.

NOTE: THE HEAVY RED "BATTERY" WIRE COMES THROUGH THE FIREWALL VIA A SEALED COMPRESSION FITTING FROM THE STARTER SOLENOID BATTERY(+) TERMINAL AND CONNECTS TO THE BATTERY TERMINAL ON THE FUSE PANEL. USE TERMINAL, SOLDER AND HEAT SHRINK PROVIDED.



Series III

3	UPDATE LABELS & PLACEMENT
2	NEW WIRE LABELS
1	ADD ELECTRIC FUEL PUMP WIRE

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PERKIOMENVILLE, PA.

JEEP FUSE PANEL

JRS | SPECIAL

3. WINDSHIELD WASHER

Push the yellow "WASHER" wire terminal onto the windshield washer pump. Fibreglass bodied Jeeps will need to run the black ground wire originally attached between the firewall and the pump motor to the chassis.

4. HORN

Push the red "HORN" wire terminal onto the horn connector. NOTE: Horns with one electrical terminal must have their cases connected to the chassis "ground". Horns with two electrical terminals will have either terminal connected to the red "HORN" wire with the remaining horn terminal connected to chassis "ground". Use "GROUND" wire provided where needed.

5. ENGINE COMPARTMENT GROUND

Locate the heavy black "Ground" wire coming from the firewall connector. Remove one of the sheet metal retaining screws from the firewall adaptor plate. Place this screw through the ring terminal on the end of the black "Ground" wire and re-attach it to the adaptor plate.

6. BACK-UP SWITCH

Locate the right angle connector attached to the firewall containing one gray and one green wire. These wires go to your back-up switch located on your transmission. Jeeps from 1976 and newer with AUTOMATIC TRANSMISSIONS have their back-up switches mounted a the bottom of the steering column inside the vehicle. This hook-up has already been accomplished for you. Older Jeeps and manual transmission Jeeps have their back-up switches mounted on or in the transmission or on the linkage. A Back-up switch has two contacts which are normally open except when the transmission is in reverse. Connect either side of the switch to the grey wire marked "BACKUP" coming from the firewall connector. Connect the remaining switch contact to the green "BACKUP" wire. Splice if necessary. Solder if possible. Eliminate the "BACKUP" connector if you don't intend to wire the back-up lamps or if the back-up switch is inside the vehicle as they are on 76 up Jeeps with automatic transmissions.

7. KICKDOWN

On vehicles which use electrical kickdown switches to force a down shift from the automatic transmission, you need to need to connect the yellow "KICKDOWN" wire to the kickdown connector mounted at the automatic transmission. This wire is connected to kickdown connector located inside the passenger compartment near the bottom of the steering column. Find your existing Kickdown connector at your transmission and splice the yellow wire to your wire. Solder and wrap securely.

8. QUADRA-TRAC

On vehicles which have "QuadraTrac", you may be able to use your present "QuadraTrac" wire by plugging it into the flat two pin connector or, use the new wire labeled "Quad" to connect the kickdown switch to the flat two pin connector. This pin will only fit into one of the two openings. When you are in 4 wheel drive, the "QuadraTrac" switch will close to "ground" this wire. When the wire is "grounded" the QUADRATRAC lamp on the instrument cluster will light.

9. WARNING LAMP SWITCH

Locate your present wires from the "Brake Warning Switch" located on the brake distribution block which connects the master cylinder to the front and rear brakes. Plug it into the "T" shaped connector coming from the firewall connector. This connector has black wires marked "WARNING". When there is an unbalance in the hydraulic system (brake failure) the "Warning" switch will close. This switch closure will light your "Brake Warning" lamp located in your gauge cluster when the ignition is "ON" and there is a brake failure.

10. ANTI-DIESEL SOLENOID

Locate the red wire with a ring terminal on the end marked "IGN2". This wire provides power to the "Anti-Diesel" Solenoid. This wire is "HOT" whenever the ignition is "ON". Connect the ring terminal to the electrical post on the "Anti-diesel" solenoid. This solenoid should "snap" when power is applied and the throttle is lifted slightly. When the engine is stopped, this solenoid is released and the throttle plates close to halt any "Run-On" due to higher than normal idle speed.

11. CHOKE

Locate the long red wire marked "CHOKE". This wire provides power to heat your electric choke. Vehicles

ENGINE COMPARTMENT WIRING CHART

WIRE LABEL	COLOR	SOURCE	DESTINATION	COMMENTS
IGN SYS	DARK BLUE	FUSE PANEL (FUSE 6)	BALLAST RESISTOR TOP LUG	POINTS & FORD IGNITION
IGN +	DARK BLUE	BALLAST RESISTOR	IGNITION COIL (+) POST RED/WHITE FORD IGNITION WIRE (SEE SHEET ON FORD IGNITION HOOKUP)	FOR FORD IGNITION SYSTEM ONLY
I TERM	DARK BLUE	BALLAST RESISTOR	STARTER SOLENOID "I" POST (NOT REQUIRED FOR "GM" HEI DISTRIBUTOR)	BYPASSES BALLAST DURING CRANK
TACH	YELLOW	TACHOMWTER "S" POST	COIL (-) POST	AFTERMARKET TACHOMETER
WATER	DARK BLUE	WATER TEMP GAUGE "S" POST	ENGINE WATER TEMP SENDER UNIT	SENDER IN ENGINE WATER JACKET
OIL	LIGHT GREEN	OIL PRESS GAUGE "S" POST	OIL GAUGE SENDER UNIT	AT ENGINE
START	VIOLET	STARTER SWITCH	STARTER SOLENOID "S" TERM.	VIA NEUTRAL SAFETY SWITCH IF AUTOMATIC TRANSMISSION
IGN 2	RED	FUSE PANEL (FUSE 7)	ANTI-DIESEL SOLENOID	RING TERMINAL (IF REQUIRED)
CHOKE	RED	FUSE PANEL (FUSE 7)	ELECTRIC CHOKE	PLUGGED INTO "IGN 2" CONNECTOR SOMETIMES THRU OIL SWITCH
TCS	GREEN	FUSE PANEL (FUSE 7)	EMMISSIONS "TCS" SOLENIOD	PLUGGED INTO "IGN 2" CONNECTOR (IF REQUIRED)
OPT 1	BROWN	BULKHEAD CONNECTOR "D"	PASSENGER COMPARTMENT	
WARNING CONNECTOR	2 BLACK	INST. POWER (FUSE 8) THROUGH "WARN" LAMP	WARNING LAMP	
BACK-UP	GREEN	FUSE PANEL (FUSE 8)	BACK-UP CONNECTOR (SWITCH)	
BACK-UP	GREY	BACK-UP CONNECTOR (SWITCH)	BACK-UP LAMPS	VIA REAR HARNESS CONNECTOR
QUAD	VIOLET	QUADRATRAC LAMP	QUADRATRAC SWITCH	SWITCHES TO GROUND
KICKDOWN	YELLOW	KICK DOWN SOLENOID	KICK DOWN SWITCH	FOR TURBO-HYDRO 400
ALTNR	HEAVY RED	ALTERNATOR "BAT" POST	STARTER SOLENOID POST WHERE HEAVY BATTREY (+) ATTACHES	USE SMALL FUSE LINK AT SOLENOID
BATTERY	HEAVY RED	STARTER SOLENOID POST WHERE HEAVY BATTREY (+) ATTACHES	FUSE PANEL "BAT" STUD	THRU FIREWALL GROMMET

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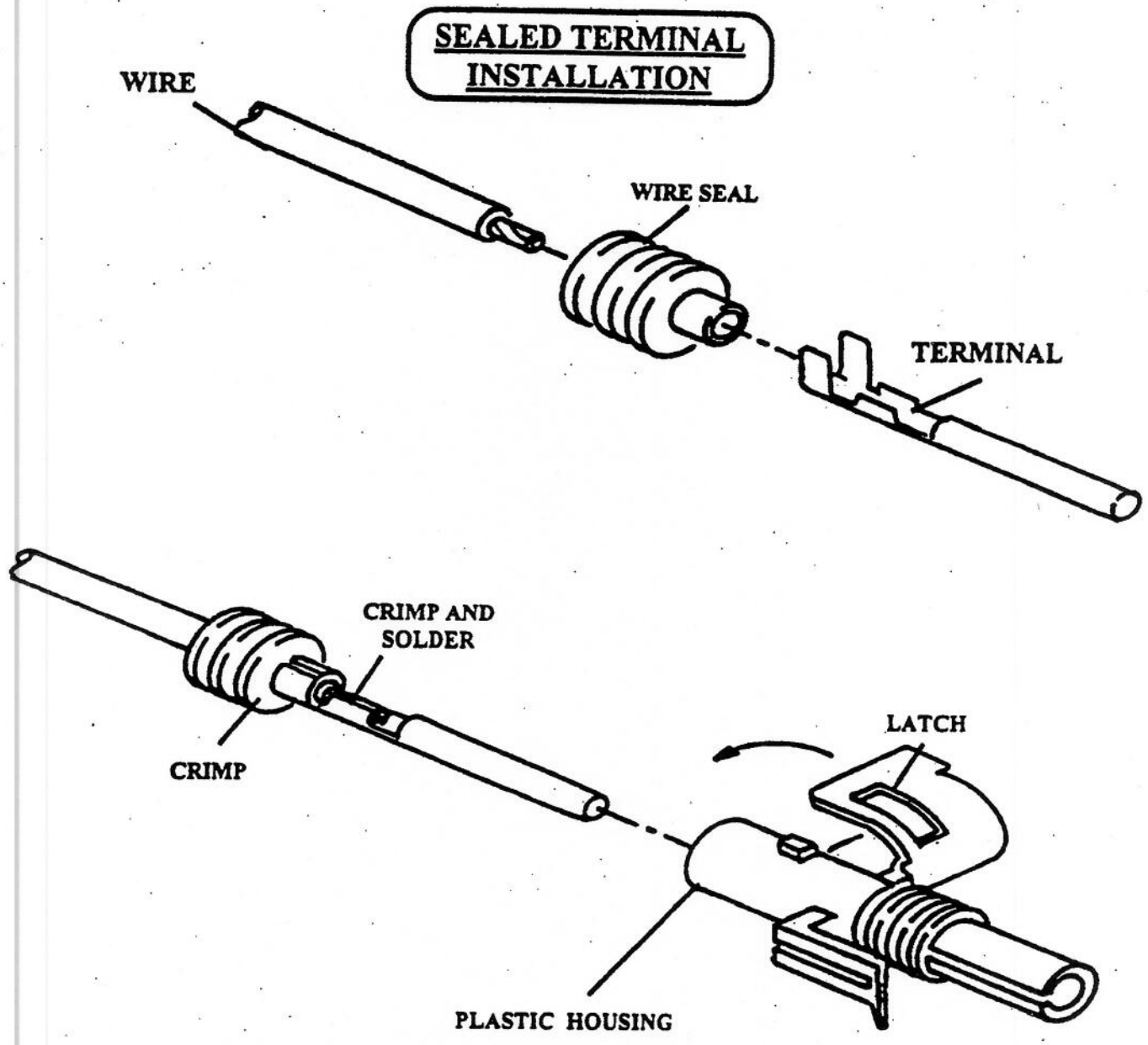
ENGINE WIRING CHART

JRS	SPECIAL	REV 0
DATE: 17AUG1993	SHEET 1 of 1	



9. Snap each tail lamp assembly connector installed at step 8 into the corresponding connector on the rear harness. Close latch.

10. Route the harness into its stock position.

ENGINE COMPARTMENT HARNESS INSTALLATION

Maximum flexibility has been provided to allow you to attach the engine compartment harness to the stock engine as well as to engine conversions. The engine harness plugs into the new firewall bulkhead connector and has two cables running from it. The first harness contains the wires and connectors necessary to wire the headlamps, parking lamps, turn signal lamps etc. The remaining harness contains wiring for the engine, emissions and charging systems. To

MOTORCRAFT ELECTRONIC IGNITION TROUBLESHOOTING

Magnetic Pick-Up Test

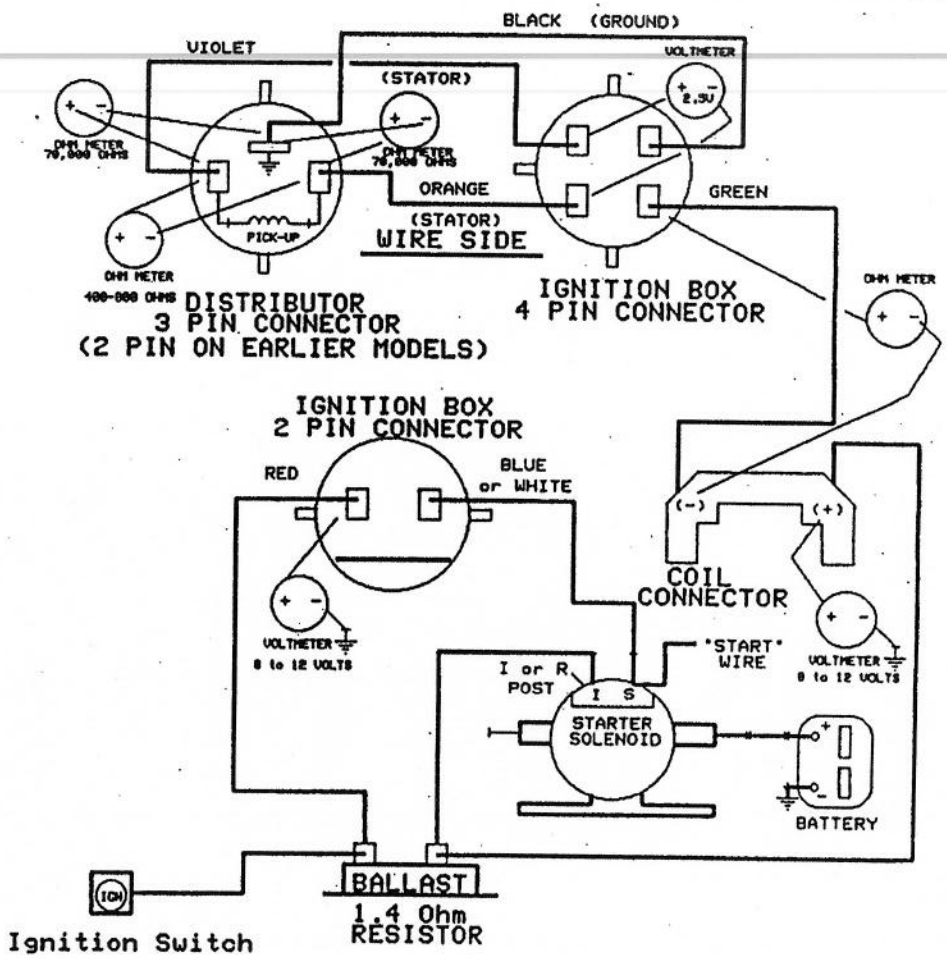
Use a VOLT/OHMMETER to measure the resistance across the VIOLET and ORANGE wires from the distributor. Place the meter on the 2000 OHMS scale. Touch the RED meter lead to the VIOLET wire and the BLACK lead to the ORANGE distributor terminal. The meter must read between 400 and 800 OHMS. Replace the distributor or the wiring between the distributor and ignition box if this reading is not correct.
The BLACK distributor wire must read nearly 0 ohms when measured between the BLACK wire terminal and engine GROUND.

Place the meter in the 2.5 Volt range (make certain to use a non-digital meter). Connect the leads to the VIOLET and ORANGE wire terminals as per test 1. Crank the engine, the needle must flicker to show proper distributor operation.

IGNITION BOX TEST

Make certain that the GREEN wire from the ignition box goes to your coil (-) terminal. Use you OHMMETER to check for nearly 0 ohms from the IGN box to the coil (-). The BLUE or WHITE wire must connect to the "S" terminal of your starter solenoid. Check it. Power comes from the ignition switch to the BALLAST resistor and to the RED ignition box wire. The other BALLAST resistor post powers the coil (+) and is wire to the "I" or "R" post on your starter solenoid. This post supplies full battery voltage to your coil(+) when cranking. Use your voltmeter to test for a KEY-ON voltage of 8 to 12 VOLTS at the coil (+) post with the motor stopped. Check the voltage by putting the BLACK meter lead to engine GROUND and the RED lead to the coil (+). Check the wiring between fuse panel and ballast resistor as well as the coil (+) if the voltage is low or missing. The BALLAST resistor is 1.4 OHMS.

Keep the meter connected to the coil then crank the engine. The voltage should be between 8 and 12 volts during cranking. If the voltage is too low, check the wiring between the solenoid "I" or "R" post and the ballast.



FORD DURA-SPARK ELECTRONIC IGNITION

CENTECH INC. PERKIOMENVILLE, PA.	
TROUBLE SHOOTING	
JRS	SPECIAL REV 0
DATE: 25SEP1995	SHEET of

UNPACKING

Carefully unpack your new Centech Jeep Wiring Kit. Note that there are three separate plastic bags with each containing one wiring section for your Jeep. There is the engine compartment wiring, the passenger compartment wiring and the rear section wiring harness. This kit has been broken down into these three sections to make it easier for you to install your harness.

TOOLS

This kit requires only the basic hand tools for installation. You will need the following tools:

Screwdivers
Nut driver or Socket Set
Drill Motor and Drills
5/8" Holesaw or Greenlee Punch
Electrical Terminal Crimping Tool
Soldering Iron
Factory Jeep Manual or Haynes Repair Manual

FEATURES

Every Centech Jeep wiring kit has been designed for maximum reliability and flexibility. Reliability has been improved by our use of only the highest quality materials including special "cross-link" insulated wires and the new weather-proof connectors. Additionally, we have re-designed the firewall connection system to include a modern bulkhead connector employing individually sealed wires. Mounting hardware is stainless steel for longevity and most terminals are soldered to increase reliability.

Each kit includes special wiring in the engine compartment which allows you to wire your "stock" or "aftermarket" gauges and ignition systems. Special provisions have been made to allow you to install this harness into a fiberglass Jeep body adapted to the standard chassis.

Centech uses cross-link insulated copper wire in its harnesses. Cross-link wire has the ability to withstand incredible abuse from high temperatures, acid and abrasion and is found in only the newest vehicles. As a bonus, we have included many additional ground wires to compensate for the lack of a conventual "ground" found in non-conductive fiberglass bodies. These wires allow you to use the chassis as the "ground" system in place of the sheet metal. For additional reliability, we have included many wires soldered to their terminals to eliminate the possibility of poor electrical connections. Whenever possible, "Ring" terminals have been substituted for the old style Jeep "push-on" terminals. Ring terminals require a nut to hold them in place and are more reliable than simple push-on terminals.

Due to the many variations of engines, ignition and charging systems found in Jeeps, Centech has developed a method to allow you to customize each kit to your special requirements. Engine compartment wires which go to the engine and charging system have been made extra long and are labeled along their length to show their destinations. Special sleeves are included to protect each wire from abrasion. For example, there is a green wire labeled "oil" which connects the "oil pressure" sender to the oil pressure gauge. This wire must be cut to length, stripped, a piece of protective sleeving slipped over the wire, and a electrical terminal installed prior to connecting it to the sender. You have maximum flexibility when using this method. Excellent reliability is due to your using a modern electrical lug which gets bolted to the sender instead of being pushed on. Using our harness will allow you to wire the stock Jeep engine or do an engine conversion (Chevy V8s etc). **Of course, each kit comes with wiring for a modern Delco alternator that has a built-in regulator. This charging system is inexpensive and readily available. If you don't currently have the Delco alternator, you will need a change to the Delco charging system or you can elect to stay with your current alternator by modifying our alternator wiring.** Since you have decided to spent your valuable time and money to re-wire your Jeep, going one step further to install a modern charging system is a wise choice.

Many Jeeps use a Ford Motorcraft ignition system. This system includes an "ignition box", special distributor and coil which use a special "coil clip" connector. Unfortunetly, the Motorcraft coil terminals corrode and are certain to fail. The special coil "clip" is available from us to replace your present clip; however, your best bet is to replace the coil with a standard screw terminal ignition coil. A ballast resistor is included with each kit to allow you to adapt any ignition system (Ford electronic, points and others) to your new wiring harness. Kits for 1974 through 1977 which use the

All You Need To Know About Grounds

1. All electrical devices MUST be connected (grounded) electrically to the negative battery post.
2. All current going into the battery (+) terminal of all electrical devices must exit via the ground terminal.
3. Heavy wires are able to handle greater amounts of current without heating than thin wires.
4. There is no such thing as a "too heavy wire."

Battery current must flow through each electrical device. In order to accomplish this goal, each electrical device must have a wire or use its case to provide a "Ground Return" back to your negative battery terminal.

Electrical devices such as headlamps provide a terminal for the ground, while devices such as parking lamps and alternators use their cases to provide the necessary path to ground.

In order to allow the battery current to operate an electrical device, it must pass through the device much like water passes through a waterwheel. If the water simply remained within the waterwheel and wasn't allowed to exit, the wheel would not turn and no work could be expected from it. Therefore, you can expect that the water entering a waterwheel will be released at the bottom of the wheel when the wheel turns. Basically, you can equate water flow to current flow and water pressure to battery voltage. The amount of current flow is determined by the resistance of the device and the size of the wires going to the device. Picture water running through a large pipe. This pipe will be able to handle a large volume of water without much pressure loss but, if you were to force the same volume of water through a small pipe, you will have a large pressure loss. That is, the pressure at the inlet side of the pipe will be much greater than the pressure at the exit. This loss is due to resistance. Resistance to the flow of water and resistance to the flow of battery current is essentially the same thing.

USING THE FRAME AS A GROUND

Using the frame as a electrical path to the battery (-) terminal is an efficient method of wiring the ground portion of your vehicle. Even though steel is not as efficient as copper when it comes to the conducting current, the thickness and size of the frame easily compensates for the loss in efficiency. The main concern when using your frame as a ground is the problem of getting a good low resistance connection between the battery post and the frame. This method requires the builder to drill and tap the frame or weld on "grounding tabs" at numerous places to allow the attachment of individual ground return wires. In many instances, a ground is made by simply bolting the electrical unit to the frame or to the engine itself.

INSTALLING NEW FIREWALL CONNECTOR

Removing the stock firewall connector leaves an opening in the firewall where you will install the stainless steel firewall connector adaptor plate. Included with the plate is the stainless steel hardware needed to mount the adaptor plate to the firewall. You will need some RTV sealer to seal the adaptor plate to the firewall. Apply the sealer on the surface between the firewall and the adaptor prior to tightening the screws and wipe away excess sealer. You will need to drill two additional holes to help hold the adaptor to the firewall.

1. Clean surface around the old firewall opening.
2. Find the firewall connector adaptor plate and place it against the opening from the engine side. Note that there are two large holes located diagonally from each other. These holes match the mounting holes presently in the firewall. The two smaller holes located at the remaining two corners are used to attach two additional screws to keep the adaptor plate tight.
3. Place a small amount of sealer around the rear perimeter of the adapter. Use the two heavy screws (1/4-20) which came with the adaptor to fasten the plate to the firewall. Use the stainless steel lockwashers and nuts provided.
4. Locate the two self-tapping screws which came with the adaptor. Use a 1/8" drill to drill two holes through the two smaller adaptor holes into the metal firewall. Screw each self-tapping screw through the adaptor plate into the firewall and fasten securely.
5. Wipe away all extra sealer from firewall opening.

DASHBOARD HARNESS INSTALLATION

1. See Dash Board drawing. This drawing shows a rear view of the instrument panel. Use this drawing to help you install the new dash harness.
2. Layout the new dash harness along the path where the original harness was routed.
3. Refer to the drawings in section 2 to show each connector.
4. Start by plugging in the headlamp connector then work your way across to the wiper switch and fan switch.
5. Use Gauge Cluster drawing to identify the rear view of the gauge cluster. Take the harness and attach the cluster wires as required to the cluster. Snap the indicator and dash lamps into their openings.
6. Locate the ignition switch connector, neutral safety switch and back-up switch (automatic transmissions) connectors. Snap them into their respective switches.
7. Locate the flat black turnsignal switch connector located near the top of the steering column. Plug the new harness turnsignal connector into the turnsignal switch connector.
8. Continue to connect all remaining harness connectors. Note that there are three separate connectors used with the wiper/washer switch. The red wire supplies the power. The yellow wire feeds the washer motor. See Figure 5. Plug your existing wiper motor wires into the wiper switch.
9. Move the dash board back in place near the cowl. Replace two dash board screws to hold the dash in place.
10. Locate the bulkhead connector attached to the left side of your dash harness. Place this connector through the firewall adaptor opening then secure it with the stainless steel nuts and lockwashers provided in the adaptor kit.
11. To wire your courtesy lamps, find the connector coming from the harness near the headlamp switch which has a white and a white with black stripped wire. These long wires will allow you to install new interior lamps in your Jeep. Connect the white wire labeled "D-Fuse" to the center contact of the lamp(s). Connect the white/black wire labeled "D-SW" to the metal shell of the lamp. The headlamp switch turns "ON" the interior lamps by grounding the white/black "D-SW" wire. The "D-Fuse" wire supplies the power from the fuse panel. For STOCK lamps, connect the white "D_Fuse" wire to the brown wire from the lamps and connect the white/black "D-SW" to the blue lamp wire. Note: the headlamp switch housing must be grounded on Jeeps using fiberglass dashes. Drill into the metal switch housing and attach the black ground wire from the new harness to the housing with a small sheet metal screw.

FUSE PANEL INSTALLATION

The fuse panel is mounted just below the firewall connector on the inside of the Jeep. Use the four sheet metal screws provided to fasten the fuse panel to the firewall. Be certain to position the panel so that the mounting holes are clear of all obstacles on the engine side of the firewall. Begin by holding the panel in position and drilling one 1/8" hole through the most accessible mounting hole. Use one of the mounting screws to hold the panel in place. Drill through the remaining three mounting holes and fasten the fuse panel securely to the firewall. Refer to the drawing on the Jeep fuse panel as to where each wire is connected. Each wire will need to be stripped back 1/8", inserted into the fuse panel terminal strip and secured by the screw on the top side of the terminal strip.

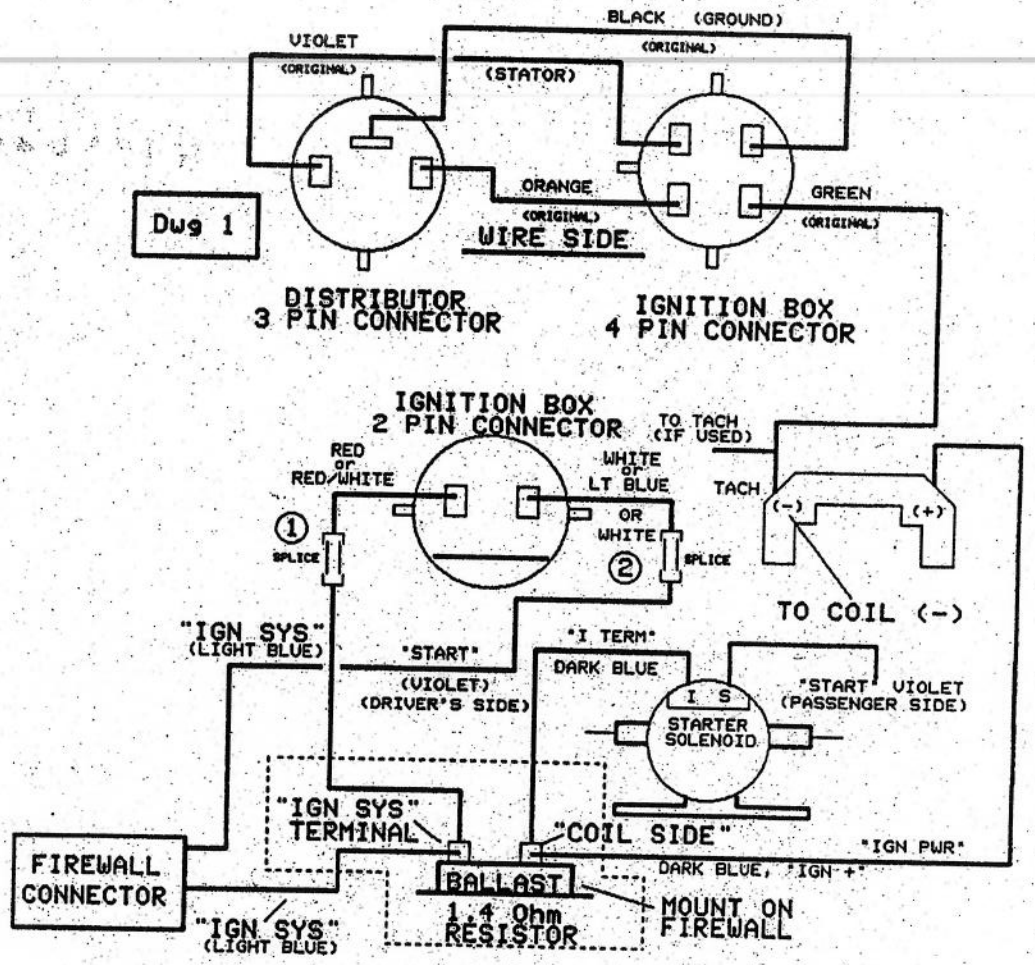
MOTORCRAFT (FORD) ELECTRONIC IGNITION

THE FORD IGNITION USES A SPECIAL ELECTRONIC BOX AND COIL. PLUS, MANY REQUIRE AN EXTERNAL BALLAST RESISTOR. IN MOST CASES, THE BALLAST RESISTOR COMES IN THE FORM OF A WIRE FROM THE IGNITION SWITCH TO THE COIL. FOR MAXMIUM FLEXIABLITY, WE USE A BALLAST RESISTOR UNIT WHICH MOUNTS ON ANY METAL SURFACE TO REMOVE HEAT.

IT WILL BE NECESSARY FOR YOU TO REUSE SOME OF THE EXISTING IGNITION BOX WIRES TO UTILIZE THE STOCK FORD IGNITION. FIND THE WIRING CONNECTING THE DISTRIBUTOR TO THE IGNITION BOX. THESE WIRES CONSIST OF A PLUG AND WIRING CONNECTING THE IGNITION BOX TO THE DISTRIBUTOR (violet, orange and black) AND THE GREEN WIRE GOING TO THE COIL (-) POST. YOU WILL SPLICE TWO WIRES COMING FROM THE HARNESS NEXT TO THE BALLAST RESISTOR TO THE "RED" AND "WHITE" WIRE FROM THE IGNITION MODULE.

WIRING INSTRUCTIONS

1. Locate the ignition module. Make certain that the metal box is "grounded" to the fender panel or to the frame.
2. Connect the 4 pin plug from the box to the and to the coil(-) post. Re-use the original wiring.
3. Locate the light blue "IGN SYS" and the violet "START" wires exiting the harness near the ballast resistor.
4. Splice the light blue "IGN SYS" wire from near the ballast resistor to the RED wire which was previously connected to the 2 pin ignition module connector. (1)
5. Splice the violet "START" wire coming from the harness near the ballast resistor to the WHITE wire attached to the ignition module. (2)
6. Locate two blue wires coming from the engine harness at the passenger side marked "I TERM" and "IGN +".
7. Connect the "IGN +" wire to the coil (+) post.
8. Connect the "I TERM" wire to the "I" or "R" post on the starter solenoid.



NOTE: WHEN USING A NON-STOCK COIL, ALWAYS BUY A A COIL WHICH USES A 1.4 Ohm BALLAST. AFTERMARKET COILS WITH POSTS WILL BE MORE RELIABLE THAN THE STOCK "HORSESHOE" COIL ASSEMBLIES. CENTECH CAN SUPPLY A NEW HORSESHOE CONNECTOR IF NECESSARY.

LATE MODEL FORD ELECTRONIC IGNITION

4	SHOW NEW Ford BOX WIRING
3	MOVE RED/WHT WIRE TO "IGN SYS"

CENTECH INC.
PERKIOMENVILLE, PA.

DURA-SPARK IGNITION

JRS	REV 4
DATE: 20July1999	SHEET of

Motorcraft Ignition system do not need to use a ballast resistor. 1978 and newer Motorcraft ignition systems use our 1.4 Ohm ballast resistor. It will be necessary for you to use the factory wiring with the Motorcraft system (see instructions for ignition systems on MotorCraft Instaalation sheet). Jeeps 1973 and older, use a points ignition system with a ballast. Use the ballast resistor supplied with your kit for these installations.

INSTALLATION HINTS

The most complicated area to rewire is the harness behind the dash. In reality, most dash board connectors are not interchangeable and can be installed only one way; therefore, you shouldn't be overly concerned. There are several wiring methods to ease your concern. One method to rewire the dash board with the least chance of making an error is to remove the dash and wires intact then simply unplug each old wiring connector and replace it with the new connector, one connector at a time. If you feel that you will not remember these connectors, you can mark each connector as it is removed. Alternatively, you could simply remove all dash wiring and use the photos to identify each connector. If you intend to rewire your Jeep but don't want to completely remove the dash board, your best bet would be to unbolt the steering column assembly and dash then move it away from the cowl so that it can be supported by several wires to hold it in place. Several connectors are plugged into the steering column connectors such as the turn-signal connector, horn etc. and may need to be removed first a to allow access to the remaining switches and connectors.

Later model vehicles (1976 up) have the ignition switch attached to the center of the steering column shaft, with the neutral safety and back-up switch located at the very bottom of the column near the floor. Stick shift cars need to have a jumper installed to bypass the neutral switch connector. Your kit has the jumper installed from the factory. For automatic transmission Jeeps, you will need to remove the jumper and push the neutral switch connector onto the neutral safety switch pins.

EXISTING WIRES

Many Jeeps will need to use some of the existing wiring due to the lack of availability of the original connectors. Wires from the Quadra-trac and a transmission mounted back-up lamp switch will snap into the new harness as required. The wires from the wiper motor to the wiper switch must be re-used in many applications.

GROUNDS

Additional ground wires will be found throughout the harness and will need to be attached to the chassis as required. See our enclosed paper titled **"All You Need To Know About Grounds"** for additional information.

GAUGES

Kits which are designed to work with the stock gauge cluster come complete with all lamps and wiring along with the necessary wires for the dash lamps which light the various switches and gauges. Kits designed to work with aftermarket or custom dashes contain extra long labeled wires to wire their new gauges, indicator lamps, and panel lamps. All that is needed is for the installer to read the label on the wire to identify its function then connect the wire as required to the its gauge or lamp. You will use the instructions which come with your new gauges to wire them to your harness.

WIRING REMOVAL

Since you are installing a completely new harness which includes an improved firewall connector, you will first need to remove the old harness. Since it is easier to install the dash harness when the dash board is out of the car, those of you who are installing a fiberglass body or who are using a new or restored dash should use Fig 1 to identify each dash switch and dash lamp.

For those who are just installing the new harness in place of the old harness and not replacing the body, you must first remove the harness from the front of the vehicle. This harness is attached to the firewall connector located at the upper right portion of the firewall.

Your kit **does not** include the heavy wiring between the battery and the starter solenoid / engine. Jeeps must have a good battery wiring system eliminate the "Hot Start" problems and will start easier in the cold as well. There are too many variations to allow us to supply these wires; however, after installing the main harness, take measurements of the