

Magnecor 7mm ELECTROSPORTS 70 SS Ignition Lead Specifications

OVERALL LEAD ASSEMBLY

Outside Diameter of Cable.....	7mm.
Colour.....	Black.
Boot/Terminal Configuration.....	Various - to suit different domestic and foreign applications as well as customer special requirements.
Country of Manufacture.....	Cable: USA. Assemblies: USA, UK and Australia.

CABLE

Construction Type.....	Two section: Insulator bonded with tape to high tear strength, high heat resistant outer jacket.
Insulator Material.....	High dielectric silicone rubber.
Outer Jacket Material.....	Extreme high tear strength, high temperature resistant silicone rubber.
Heat Resistance.....	205° C (400° F) service temperature.
Dielectric Strength.....	45,000 volts.

CONDUCTOR

Conductor Size.....	1.90 mm in diameter.
Conductor Type.....	Magnecor Metallic Inductance RFI and EMI Suppressed. No conductive coatings applied.
Core.....	Ferrimagnetic base over Kevlar and fiberglass substrate.
Windings.....	77 turns per cm (200 turns per inch).
Windings Material.....	Stainless steel.
Resistance.....	98.4 ohm per cm, 3K ohm per ft. \pm 10%.
Capacity.....	45,000 volts, 2kVA.

TERMINALS

Spark Plug.....	Stainless steel snap-lock 180° bendable and fixed 90° styles.
Distributor and Coil.....	Brass, stainless steel snap-lock 180° and 90° styles.

PROTECTIVE BOOTS

Spark Plug.....	Silicone 205° C (400° F) - selection of straight, 45° and 90° styles used where applicable - special connector assemblies for some applications.
Distributor and Coil.....	EPDM or Silicone - some sets will be fitted with OE style connectors.

AVAILABILITY

NO MINIMUM ORDER REQUIRED	Available in sets to fit domestic and import car, truck, motorcycle and marine engines. Also, universal sets, individual leads, and tailored sets. Loose cable, boots and terminals can be purchased separately.
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MAGNECOR®

ELECTROSPORTS 70 SS IGNITION CABLE

EXTREME STRENGTH
HIGH TEMPERATURE
RESISTANT SILICONE
RUBBER JACKET

METALLIC
INDUCTANCE
SUPPRESSED
CONDUCTOR
ACHIEVES
SUPERIOR EMI
SUPPRESSION
WITHOUT A
CONDUCTIVE
COATING

HIGH DIELECTRIC
STRENGTH INTERNAL
SILICONE INSULATOR
BONDED BY TAPE TO
OUTER JACKET FOR
SUPERIOR TERMINAL
RETENTION



NEW FOR 2006

Magnecor's (Original Equipment size)
7mm Lead Sets now use

ELECTROSPORTS 70 SS IGNITION CABLE

Vastly superior replacement for OE and aftermarket ignition leads (wires in USA) using carbon conductors or resistor/connectors at lead ends, all of which reduce spark energy when deterioration develops with usage.

ELECTROSPORTS 70 SS IGNITION CABLE, with its updated high-tech wire-wound conductor, will properly suppress both RFI and EMI on all engines without reducing spark current or deteriorating with use. The high tear strength silicone rubber insulating jacket provides better insulation than most 8mm aftermarket ignition leads, and new construction provides better terminal retention than ever before.

Any lead set using **ELECTROSPORTS 70 SS IGNITION CABLE** can be used on both older and newer carburetted engines as well as the most modern fuel injected engines using any electronic engine management system. Suppression is also provided for 2-way radio and computer equipment.

www.magnecor.com

TECHNICAL INFORMATION

MAGNECOR[®] ELECTROSPORTS 70 IGNITION CABLE

For over 20 years Magnecor manufactured ignition leads using its 7mm **HIGH PERFORMANCE IGNITION CABLE**. Lead sets (wire sets in USA) using this cable were very popular as a superior replacement for 7mm size original equipment and aftermarket ignition leads using limited-life carbon conductors and resistor/connectors at lead ends. Over the years, the wire-wound conductor was updated to provide better RFI suppression, and later versions achieved moderate EMI suppression.

A small 7mm insulating jacket makes providing a wire-wound conductor to properly suppress EMI (needed by late model engines) both difficult and expensive. To suppress EMI, most manufacturers use leads with carbon conductors and resistor/connectors at lead ends. Although these leads deteriorate with use and spark current is reduced, manufacturers are not concerned, because they all treat ignition leads as service items to be replaced regularly. Others in the aftermarket use cheap wire-wound conductors that cannot properly suppress EMI (no mention is ever made of this fact).

In the past, it has been a policy at Magnecor to recommend our 8.5mm **KV85 COMPETITION CABLE** sets (designed primarily for race engines) if we thought a possible EMI problem could arise on later model engines fitted with 7mm leads as original equipment. Of course, not all vehicle owners necessarily want to purchase more expensive larger diameter ignition leads designed for a race engine. All they want is good ignition leads with a conductor providing proper suppression that won't deteriorate with usage – more so, with so many late model “multi-valve” engines using ignition leads (fitted with complicated extended spark plug connectors) that have become very expensive and time consuming to replace.

The good news is, with the recent introduction of our **ELECTROSPORTS 70 IGNITION CABLE**, we can now offer a 7mm ignition cable with a wire-wound conductor to properly suppress both RFI and EMI.

Lead sets using **ELECTROSPORTS 70 IGNITION CABLE** can be used on both older and newer carburetted engines and the most modern fuel injected engines using any electronic engine management system. Excellent suppression is also provided for 2-way radio equipment. In addition, a new insulating jacket provides better insulation than most 8mm original equipment and aftermarket leads, and new construction provides better terminal retention than ever before.

Remaining Limitation

When used with either the original ignition system or a better ignition system designed for street use, lead sets using our **ELECTROSPORTS 70 IGNITION CABLE** will prove to be vastly superior to all limited-life 7mm original equipment and aftermarket carbon conductor leads, resistor/connector leads and other brand wire-wound conductor leads. However, **no** 7mm or 8mm cable size leads can fully insulate the maximum output from a racing ignition system. If you intend to ever modify your vehicle for competition we recommend our lead sets using either our:

KV85 COMPETITION CABLE (8.5mm)
or
R-100 RACING CABLE (10mm)

For more information about Magnecor products,
visit our web site: www.magnecor.com

Magnecor 8mm ELECTROSPORTS 80 Ignition Lead Specifications

OVERALL LEAD ASSEMBLY

Outside Diameter of Cable.....	8mm.
Colour.....	Blue.
Boot/Terminal Configuration.....	Various - to suit different domestic and foreign applications as well as customer special requirements.
Country of Manufacture.....	Cable: USA. Assemblies: USA, UK and Australia.

CABLE

Construction Type.....	Silicone rubber insulator, re-inforcing braiding, high-tear strength silicone rubber outer jacket.
Insulator Material.....	High dielectric silicone rubber.
Outer Jacket Material.....	Extreme high-tear strength silicone rubber.
Heat Resistance.....	260° C (500° F) service temperature.
Dielectric Strength.....	55,000 volts.

CONDUCTOR

Conductor Size.....	2.00 mm in diameter (+/- .05)
Conductor Type.....	Magnecor Metallic Inductance SS25 RFI and EMI Suppressed.
Core.....	Ferrimagnetic base over Kevlar and fiberglass substrate.
Windings.....	77 turns per cm (200 turns per inch).
Windings Material.....	Stainless steel.
Resistance.....	98 ohm per cm, 3K ohm per ft. +/- 10%.
Capacity.....	55,000 volts, 2kVA.

TERMINALS

Spark Plug.....	Stainless steel snap-lock 180° bendable and fixed 90° styles.
Distributor and Coil.....	Brass and stainless steel snap-lock 180° and 90° styles.

PROTECTIVE BOOTS

Spark Plug.....	Silicone 205° C (400° F) - selection of straight, 45° and 90° styles used where applicable - special connector assemblies for some applications.
Distributor and Coil.....	EPDM or Silicone - some sets will be fitted with OE style connectors.

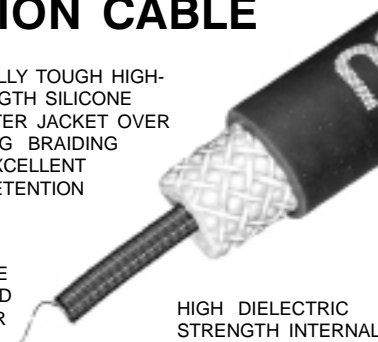
AVAILABILITY

NO MINIMUM ORDER REQUIRED	Available in sets to fit domestic and import car, truck, motorcycle and marine engines. Also, universal sets, individual leads, and tailored sets. Loose cable, boots and terminals can be purchased separately.
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MAGNECOR®

ELECTROSPORTS 80 IGNITION CABLE

EXCEPTIONALLY TOUGH HIGH-TEAR STRENGTH SILICONE RUBBER OUTER JACKET OVER RE-INFORCING BRAIDING PROVIDES EXCELLENT TERMINAL RETENTION



METALLIC INDUCTANCE SUPPRESSED CONDUCTOR ACHIEVES SUPERIOR EMI AND RFI SUPPRESSION

HIGH DIELECTRIC STRENGTH INTERNAL SILICONE RUBBER INSULATOR

Magnecor's 8mm leads can be fitted into original 7mm wire holders

ELECTROSPORTS 80 IGNITION LEADS

Vastly superior replacement leads (wires in USA) for OE and aftermarket ignition leads using carbon conductors or resistor/connectors at lead ends, all of which reduce spark energy when deterioration develops with usage.

ELECTROSPORTS 80 IGNITION CABLE, with its updated high-tech wire-wound conductor, will properly suppress both RFI and EMI on all vehicles without reducing spark current or deteriorating with use. The new extremely flexible high-tear strength silicone insulating jacket allows leads to be fitted into original 7mm holders without damage, and provides better terminal retention than ever before.

Leads using **ELECTROSPORTS 80 IGNITION CABLE** can be used on both older and newer carburetted engines as well as the most modern fuel injected engines using any electronic engine management system. Excellent suppression is also provided for 2-way radio and computer equipment. Ideal for engines using LPG or CNG and industrial applications where heat resistance and adequate suppression is important.

www.magnecor.com

TECHNICAL INFORMATION

MAGNECOR[®] ELECTROSPORTS 80 IGNITION CABLE

For over 20 years Magnecor manufactured ignition leads using its 8mm **HIGH PERFORMANCE IGNITION CABLE**. Lead sets (wire sets in USA) using this cable were very popular as a superior replacement for 8mm size original equipment and aftermarket ignition leads using limited-life carbon conductors and resistor/connectors at lead ends. Over the years, the wire-wound conductor was updated to provide better RFI suppression, and later versions achieved moderate EMI suppression.

To suppress EMI, most manufacturers use leads with carbon conductors and resistor/connectors at lead ends. Although these leads deteriorate with use and spark current is reduced, manufacturers are never concerned, because all treat ignition leads as service items to be replaced regularly. Others in the aftermarket use cheap wire-wound conductors that cannot properly suppress EMI (no mention is ever made of this fact) which causes interference problems with later model vehicles using electronic engine management systems.

In the past, it has been a policy at Magnecor to recommend our 8.5mm **KV85 COMPETITION CABLE** sets (designed primarily for race engines) if we thought a possible EMI problem could arise on later model engines fitted with 7mm or 8mm leads as original equipment. Of course, not all vehicle owners necessarily want to purchase more expensive larger diameter ignition leads designed for a race engine. All they want is good ignition leads with a conductor providing proper suppression that won't deteriorate with usage – more so, with so many late model “multi-valve” engines using ignition leads (fitted with complicated extended spark plug connectors) that have become very expensive and time consuming to replace.

The good news is, with the recent introduction of our **ELECTROSPORTS 80 IGNITION CABLE**, we can now offer a 8mm ignition cable with a wire-wound conductor to properly suppress both RFI and EMI.

Lead sets using **ELECTROSPORTS 80 IGNITION CABLE** can be used on both older and newer carburetted engines and the most modern fuel injected engines using any electronic engine management system. Excellent suppression is also provided for 2-way radio equipment.

FOR THOSE WANTING TO FIT A LARGER SIZE CABLE INTO ORIGINAL 7mm LEAD HOLDERS:

The new extremely flexible high-tear strength all silicone construction of the cable allows leads to be fitted into original 7mm holders without damage to either the cable or the holders.

IF YOU PREFER TO MAKE YOUR OWN LEADS:

The construction of **ELECTROSPORTS 80 IGNITION CABLE** allows us to satisfy the ever-increasing demand for cable sold separately. This cable's jacket is easy to strip (to expose the conductor) even without a stripping tool, yet the extremely tough jacket makes hand-terminating practical, as the strength and flexibility of the cable provides better terminal retention than ever before. The conductor is finished with a conductive bind coating to prevent the windings from unravelling during hand-termination. Of course, Magnecor can also supply all terminals, boots, and extended connectors to use with the cable. No minimum order is required.

For more information about Magnecor products,
visit our web site: www.magnecor.com

KV85 Version 5 (8.5mm) Competition Ignition Cables

R-100 Version 3 (10mm) Racing Ignition Cables

MAGNECOR RACE WIRES

Magnecor KV85 Version 5 (8.5mm) Competition and **R-100** Version 3 (10mm) Ignition Cables are specifically designed and constructed to conduct the maximum output generated by conventional and racing ignition systems to the spark plugs; and to provide full suppression for both **EMI** (electro magnetic interference) and **RFI** (radio frequency interference).

Magnecor KV85 and **R-100** Ignition Cables will enable output maximization from both conventional and specific race ignition systems on engines using turbo-charging, super-charging, and exotic fuels, particularly if electronic equipment, including computer controlled ignition, fuel and engine management systems, are also fitted to the vehicle. Improved clarity for radio and television transmission and reception can also be expected because of the RFI reduction.

EMI suppression problems are caused by electrical energy picked up by sensors and wires connected to computerized equipment from ignition wires not designed or constructed (despite claims by manufacturers) to suppress **EMI**. As a result, computers and other electronic devices react to erroneous signals, often causing erratic engine running that may not immediately be associated with **EMI** emitted from ignition wires.

All serious **EMI** problems associated with cheap (to manufacture) generic "mag, spiral, heli, monel, pro, chromel, super, energy, twin core" etc. spiral conductor ignition wires (usually mass-marketed with well publicized performance component providers' name printed on them), and expensive so-called "capacitor" wires with partial grounded metal braiding over the jacket are eliminated by **Magnecor KV85** and **R-100** Ignition Cables. Most of these ignition wires are promoted as having little or no "resistance" if measured with an ohmmeter, and, in reality, provide little, if any, EMI suppression.

Independent tests have shown that, contrary to the exaggerated claims made by most ignition wires promoters, no spiral conductor ignition wires with low measurable electrical resistance or

grounded "capacitor" wires will either boost the ignition coil's output or adequately suppress **EMI** on race or street engines. An ignition wire's ability to conduct the full spark energy required to fire the spark plug gap and provide adequate **EMI** suppression is solely determined by the design and construction of conductors that are beyond the manufacturing capability of most ignition wire manufacturers. In reality, "low" electrical resistance only indicates a design to cut manufacturing costs.

Magnecor KV85 and **R-100** Ignition Cables feature Magnecor's exclusive **2.5mm Metallic Inductance Suppressed Conductor** that consists of heavy duty stainless steel windings precisely spaced and wound at 200 turns per inch. The conductor is wound to provide an effective magnetic coupling for efficient **EMI** suppression and a capacitive reserve to help overcome the deficiency of high engine speed ignition coil energy regeneration. The use of a ferrimagnetic base core also provides efficient **RFI** suppression. The stainless steel conductor windings are exposed without a conductive bonding layer after insulating jacket is stripped away to provide a clean metal-to-metal terminal contact to prevent burnout when using high amperage racing ignition systems.

Magnecor KV85 and **R-100** conductor core substrates also serve as strength members to provide terminated wire assemblies with excellent pull strength. This enables the use of a specially formulated aerospace grade one piece pure silicone rubber insulating jacket with exceptional thermal conductivity and high temperature resistance capabilities. The 10mm diameter **R-100** Racing cable is recommended for use with ultra high output ignitions and magnetos.

Magnecor KV85's insulating jacket can withstand up to 1,000°F (540°C) and **R-100** up to 1,200°F (650°C). Since both jackets are made entirely of a one compound silicone rubber - heat will dissipate away from any area subjected to the extreme heat that would normally destroy other brand multi-layer "silicone" ignition wires, as well as wires encased in tight fitting fiberglass mesh sleeves (with or without a "silicone" coating) that usually absorb and localize

heat from the heat source to cook and destroy any multi-layer ignition wire inside the fiberglass sleeves.

Magnecor KV85 and **R-100** Ignition Cable assemblies are fitted with boots and terminals designed to work in high temperatures. Sets are available for most popular domestic and imported performance engine configurations, as well as individual leads in various styles and lengths tailored sets to meet customer specifications. Magnecor does not use ridiculously large spark plug boots that cannot be positioned away from headers.

Unlike its competitors, Magnecor does not manufacture its products to suit prices and terms dictated by mass-merchandisers. The designs, construction and materials used by Magnecor are what works best for the applications in which all Magnecor products are used, regardless of the cost, difficulty of manufacturing, and the amount of research and continuous upgrading necessary to stay with developments in the automobile and marine racing industries.

Magnecor KV85 and **R-100** Ignition Cables can also benefit street engines fitted with exhaust emission controls, as well as marine and severe service commercial engines. Ignition noise suppression for radio and sensitive stereo equipment is also provided.

All versions of **Magnecor KV85** and **R-100** Ignition Cables have been used extensively throughout the world on road, track and marine racing engines since initial versions were added to Magnecor's extensive domestic and import product line in 1987.

NOTE:

Version 5 KV85 and Version 3 R-100 Ignition Cables comply with the demand by race engine tuners for EMI suppressed ignition cable that can also be purchased loose on spools to enable them to prepare ignition leads at a moment's notice. All Magnecor high temperature specialty boots, terminals and terminal crimping tools are available as separate items to be used with Magnecor Ignition Cables.

Magnecor KV85 V5 and R-100 V3 Ignition Cables Specifications

OVERALL LEAD ASSEMBLY

Outside Diameter of Cables.....	8.5mm (KV85) and 10mm (R-100)
Color.....	Red
Boot/terminal Configuration.....	Various - to suit different domestic and foreign applications as well as customer special requirements
Country of Manufacture.....	USA

CABLE

Construction Type.....	One piece, no cost saving layers used
Insulating Jacket Material.....	Extreme heat resistant TC-1500-HS high strength aerospace silicone rubber formulated to dissipate heat away from section exposed to high temperatures
Heat Resistance.....	KV85: 600°F (320°C) service temp. 1,000°F (540°C) short burst 3 minutes, R-100: 700°F (380°C) service temp. 1,200°F (650°C) short burst 3 minutes. Insulation remains intact if overexposed
Dielectric Strength.....	8.5mm: 60 kV, 10mm: 80 kV at 260°C
Flexibility and Tear Strength.....	Extremely strong and flexible, 8.5mm can be fitted into OEM 7mm separators. R-100 may need holes in separators enlarged to at least 8.5mm if large hole separators are not available

CONDUCTOR

Conductor Size.....	2.5mm diameter
Conductor Type.....	Magnecor Metallic Inductance EMI and RFI Suppressed
Core.....	Ferrimagnetic base
Windings.....	200 turns per inch
Windings Material.....	Stainless steel
Resistance.....	2.2 kOhm ft. (See: CONDUCTOR INFO. SHEET - 1996)
Capacity.....	80 kV, 2kVA. KV85 limited by jacket thickness to 60kV unless spaced

TERMINALS

Spark Plug.....	Stainless steel snap-lock straight (bendable) and snap-lock 90° styles
Distributor and Coil.....	Brass and stainless steel snap-lock 180° and 90° styles

PROTECTIVE BOOTS

Spark Plug.....	Silicone 600°F (320°C) - selection of straight, 45° and 90° styles where applicable - special connector assemblies for some applications
Distributor and Coil.....	EPDM - selection of normal and HEI styles where applicable

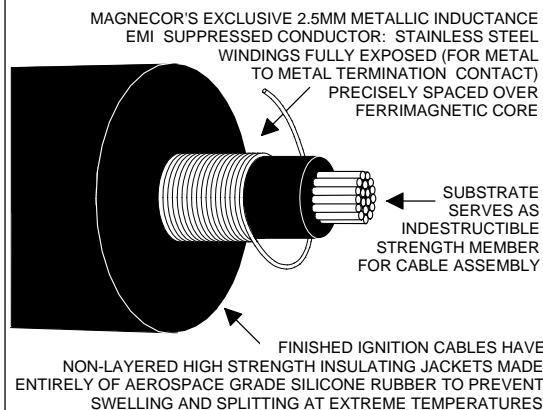
AVAILABILITY

Available in sets to fit race and modified street engines in popular demand, sets made to customer specifications (at no extra cost), universal sets, individual leads for both race and street, sets for racing made to OEM engine lengths, sets for foreign vehicle race and street engines, sets for marine and motor cycle race and street engines - as well as severe service commercial engines. Magnecor Ignition Cables can be purchased loose (wound on spools), together with OEM and specialty boots, terminals and assembly tools. A catalog is available.

NO MINIMUM ORDER IS REQUIRED

Manufactured in USA exclusively by: Magnecor Australia Limited, 2550 Oakley Park Road 200, Walled Lake, Michigan 48390 USA
Telephone: (248) 669-6688 Facsimile: (248) 669-2994

MAGNECOR® RACE WIRES METALLIC INDUCTANCE EMI SUPPRESSED CONDUCTOR



RECOMMENDED USAGE:

Magnecor KV85 and R-100 Ignition Cables are primarily designed to eliminate both EMI and RFI suppression problems resulting from the use of solid and "mag" style conductor ignition wires on vehicles utilizing high-output ignition systems together with sensitive on board electronic devices, including fuel, ignition and engine management systems, as well as radio and TV equipment. When used with high-output ignitions, exceptional ignition performance can be expected from domestic and foreign built race and modified engines using fuel injection, turbo-charging, super-charging and/or exotic fuels.

Magnecor KV85 and R-100 Ignition Cables can also be used to advantage on engines fitted with exhaust emission controls, as well as marine engines, and severe load commercial vehicle engines - particularly those using alternative fuels such as propane and natural gas with a history of persistent ignition lead failure. These engines will benefit from the ability of Magnecor Ignition Cables to conduct a high spark current at above and below normal operating temperatures.

Unless deliberately severed, Magnecor's Metallic Inductance Suppressed conductors will provide full conductance indefinitely



Distributed by:

Made in USA by:

Magnecor
3285 Martin Road 101
Walled Lake MI 48390
USA
(Head office, cable manufacturing and ignition wire assembly plant)

Assembly plants outside of USA:

Thundercords
2 Railway Parade 44
Lidcombe, NSW 2141
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<http://www.magnecor.com.au>

Magnecor Europe
Summerfield House, Station Road
Coleshill, Birmingham B46-1JG
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<http://www.magnecor.co.uk>

All prices and specifications subject to change without notice. Printed in USA

THE TRUTH ABOUT IGNITION WIRE CONDUCTORS

CARBON (SUPPRESSION) CONDUCTORS

Carbon conductors are used in original equipment ignition wires by most vehicle manufacturers, and in the majority of stock replacement wires. This style of ignition wire is cheap to manufacture and generally provides good suppression for both **RFI** (radio frequency interference) and **EMI** (electromagnetic interference). Conductor usually consists of a substrate of fiberglass and/or Kevlar over which high-resistance conductive latex or silicone is coated, and functions by reducing spark current (by resistance) to provide suppression — a job it does well while the conductor lasts. Vehicle manufacturers treat ignition wires as service items to be replaced regularly, and limited life is never an issue. This type of conductor quickly fails (burns out) if a high-powered aftermarket ignition system is used.

EMI (electromagnetic interference)

EMI from spark plug wires can cause erroneous signals to be sent to engine management systems and other on-board electronic devices used on both racing and production vehicles in the same manner as RFI (radio frequency interference) can cause unwanted signals to be heard on a radio receiver. Engine running problems ranging from intermittent misses to a dramatic loss of power can result when engine management computers receive signals from sensors that have been altered by EMI emitted from spark plug wires. This problem is most noticeable on modern production vehicles used for commuting where virtually every function of the vehicle's drive train is managed by a computer. For many reasons, the effect of EMI on engine management computers is never predictable, and problems do become worse on production vehicles as sensors, connectors and wiring deteriorate and corrosion occurs. The problem is often exacerbated by replacing the original ignition system with a high-output system.

SOLID CORE CONDUCTOR WIRES

Solid metal (copper, tin-plated copper and/or stainless steel) conductor wires are still used in racing on carbureted engines, but can cause all sorts of running problems if used on vehicles with electronic ignition, fuel injection and engine management systems, particularly if vehicle is driven on the street. Damage to some original equipment and modern aftermarket ignition and engine management systems can occur if solid core conductor ignition wires are used.

"LOW-RESISTANCE" SPIRAL WIRES

By far the most popular conductor used in ignition wires destined for race and performance street engines are **spiral conductors** (a.k.a. mag, pro, super, spiral, monel, heli, energy, ferro, twin core etc.). Spiral conductors are constructed by winding fine wire around a core. Almost all manufacturers use constructions which reduce production costs in an endeavor to offer ignition component marketers and mass-merchandisers cheaper prices than those of their competitors.

In the USA in particular, most marketers of performance parts selling their products through mass-merchandisers and speed shops include a variety of very effective high-output ignition systems together with a branded not-so-effective ignition wire line using a spiral conductor. Most perpetually try to out-do their competitors by offering spiral conductor ignition wires with the lowest electrical resistance. Some publish results which show their wires are superior to a competitor's wires which use identical cable (on which another brand name is printed). The published "low" resistance (per foot) is measured with a test ohmmeter's 1 volt direct current (DC) passing through the entire length of the fine wire used for the spiral conductor.

"Low-resistance" conductors are an easy sell, as most people associate all ignition wire conductors with original equipment and replacement ignition wire carbon conductors (which progressively fail as a result of microscopic carbon granules burning away and thus reducing the spark energy to the spark plugs) and with solid wire zero-resistance conductors that were used by racers with no need for suppression. Consumers are easily led into believing that if a spiral conductor's resistance is almost zero, its performance must be similar to that of a solid metal conductor all race cars once used. **HOWEVER, NOTHING IS FURTHER FROM THE TRUTH!**

What is not generally understood (or is ignored) is that as a result of the laws of electricity, the potential 45,000 plus volts (with alternating current characteristics) from the ignition coil (a pulse type transformer) does not flow through the entire length of fine wire used for a spiral conductor like the 1 volt DC voltage from a test ohmmeter, but flows in a magnetic field surrounding the outermost surface of the spiral windings (skin effect). The same skin effect applies equally to the same pulsating flow of current passing through carbon and solid metal conductors.

A spiral conductor with a low electrical resistance measured by an ohmmeter indicates, in reality, nothing other than less of the expensive fine wire is used for the conductor windings — a construction which cannot achieve a clean and efficient current flow through the magnetic field surrounding the windings, resulting in poor suppression for RFI and EMI.

Of course, ignition wire manufacturers save a considerable amount in manufacturing costs by using less fine wire, less exotic winding machinery and less expertise to make low-resistance spiral conductors. As an incentive, they find a lucrative market amongst performance parts marketers who advertise their branded ignition wires as having "low-resistance" conductors, despite the fact that such "low-resistance" contributes nothing to make spiral ignition wires perform better, and RFI and EMI suppression is compromised.

In recent years, most ignition wire manufacturers, to temporarily improve their spiral conductor's suppression, have resorted to coating excessively spaced spiral windings, most of which are crudely wound around strands of fiberglass or Kevlar, with a heavy layer of high-resistance carbon impregnated conductive latex or silicone compound. This type of construction hides the conductive coating's high resistance when the overall conductor is measured with a test ohmmeter, which only measures the lower resistance of the sparse spirally wound wire (the path of least resistance) under the conductive coating and ignores the high resistance of the outermost conductive coating in which the spark energy actually travels. **The conductive coating is rarely shown or mentioned in advertisement illustrations.**

The suppression achieved by this practice of coating the windings is only temporary, as the spark current is forced to travel through the outermost high-resistance conductive coating in the same manner the spark current travels through the outermost high-resistance conductive coating of a carbon conductor used in most original equipment and stock replacement wires.

In effect, (when new) a coated "low-resistance" spiral conductor's true performance is identical to that of a high-resistance carbon conductor.

Unfortunately, and particularly with the use of high-output ignitions, the outermost high-resistance conductive coating over spiral windings acting as the conductor will fail from burn out in the same manner as carbon conductors, and although in most cases, the spiral conductor will not cease to conduct like a high-resistance carbon conductor, any RFI or EMI suppression will be lost as a consequence of the coating burning out. The worst interference will come from the so-called "super conductors" that are wound with copper (alloy) wire.

However, despite the shortcomings of "low-resistance" spiral conductor ignition wires, these wires work satisfactorily on older production vehicles and race vehicles that do not rely on electronic engine management systems, or use on-board electronics effected by EMI — although with the lowest-resistance conductor wires, don't expect much RFI suppression on the AM band in poor reception areas.

Some European and Japanese original equipment and replacement ignition wires including Bougicord and NGK do have spiral conductors that provide good suppression — usually none of these wires are promoted as having low-resistance conductors — however, none are ideal for competition use, as their conductors and pin-type terminations are fragile and are known to rarely last as long as good carbon conductor ignition wires.

To be effective in carrying the full output from the ignition system and suppressing RFI and EMI in particular, spiral conductors need windings that are microscopically close to one another and precisely spaced and free from conductive coatings. To be more effective, the windings need to be wound over a core of magnetic material — a method too costly for wires sold through mass-merchandisers and most speed shops who purchase only the cheapest (to them) and most heavily promoted products.

Claims of Horsepower Gain

Every brand of spiral conductor ignition wires will perform the function of conducting coil output to the spark plugs, but **NONE**, despite the claims made in advertisements and other promotional literature, will increase horsepower. Independent tests, including a test performed by **Circle Track Magazine** (see May, 1996 issue) in the USA, show that **NO** "low-resistance" ignition wires for which a horsepower increase is claimed do in fact increase horsepower — the test also included comparisons with solid metal and carbon conductor ignition wires.

"CAPACITOR" EFFECT WIRES **with grounded metal braiding over jacket**

The most notable of exaggerated claims for ignition wires are made by Nology, a recent manufacturer of ignition wires promoted as "the only spark plug wires with built-in capacitor." Nology's "HotWires" (called "Plasma Leads" in the UK) consist of unsuppressed solid metal or spiral conductor ignition wires over which braided metal sleeves are partially fitted. The braided metal sleeves are grounded via straps formed from part of the braiding. Insulating covers are fitted over the braided metal sleeves. These wire are well constructed. For whatever reason, Nology specifies that non-resistor spark plugs need to be used with their "HotWires."

Ignition wires with grounded braided metal sleeves over the cable have come and gone all over the world for (at least) the last 30 years, and similar wires were used over 20 years ago by a few car makers to solve cross-firing problems on early fuel injected engines and RFI problems on fiberglass bodied cars — only to find other problems were created. The recent **Circle Track Magazine** (USA, May, 1996 issue) test showed Nology "HotWires" produced **no** additional horsepower (the test actually showed a 10 horsepower decrease when compared to stock carbon conductor wires).

The perceived effect a brighter spark, conducted by an ignition wire, encased or partially encased in a braided metal sleeve (shield) grounded to the engine, jumping across a huge free-air gap (which bears no relationship to the spark needed to fire the variable air/fuel mixture under pressure in a combustion chamber) is continually being re-discovered and cleverly demonstrated by marketers who convince themselves there's monetary value in such a bright spark, and all sorts of wild, completely un-provable claims are made for this phenomena.

Like many in the past, Nology cleverly demonstrates a brighter free-air spark containing useless flash-over created by the crude "capacitor" (effect) of this style of wire. In reality, the bright spark has no more useful energy to fire a variable compressed air/fuel mixture than the clean spark you would see in a similar demonstration using any good carbon conductor wire. What is happening in such a demonstration is the coil output is being unnecessarily boosted to additionally supply spark energy that is induced (and wasted) into the grounded braided metal sleeve around the ignition wire's jacket. To test the validity of this statement, **ask the demonstrator to disconnect the ground strap and observe just how much energy is sparking to ground.**

Claims by Nology of their "HotWires" creating sparks that are **"300 times more powerful,"** reaching temperatures of **"100,000 to 150,000 degrees F"** (more than enough to melt spark plug electrodes), spark durations of **"4 billionths of a second"** (spark duration is controlled by the ignition system itself) and currents of **"1,000 amperes"** magically evolving in "capacitors" allegedly "built-in" to the ignition wires are as ridiculous as the data and the depiction of sparks in photographs used in advertising material and the price asked for these wires! Most stock ignition primaries are regulated to 6 amperes and the most powerful race ignition to no more than 40 amperes at 12,000 RPM.

It is common knowledge amongst automotive electrical engineers that it is unwise to use ignition wires fitted with grounded braided metal sleeves fitted over ignition cable jackets on an automobile engine. This type of ignition wires forces its cable jackets to become an unsuitable dielectric for a crude capacitor (effect) between the conductor and the braided metal sleeves. While the wires function normally when first fitted, the cable jackets soon break down as a dielectric, and progressively more spark energy is induced from the conductors (though the cable jackets) into the grounded metal sleeves, causing the ignition coil to unnecessarily output more energy to fire both the spark plug gaps and the additional energy lost via the braided metal sleeves. Often this situation leads to ignition coil and control unit overload failures. It should be noted that it is **dangerous to use these wires** if not grounded to the engine, as the grounding straps will be alive with thousands of volts wanting to ground-out to anything (or body) nearby.

Unless you are prepared to accept **unsuppressed** ignition wires that fail sooner than any other type of ignition wires and stretch your ignition system to the limit, and have an engine with no electronic management system and/or exhaust emission controls, it's best not to be influenced by the exaggerated claims, and some vested-interest journalists', resellers' and installers' perception an engine has more power after Nology wires are fitted. Often, after replacing deteriorated wires, any new ignition wires make an engine run better.

OTHER DEVICES CLAIMING TO " INCREASE" SPARKS

Never be fooled by any device that is fitted between the ignition coil and the distributor, and/or distributor and the spark plugs (including in place of ignition wires) for which claims of increased power, multiple sparks, and better fuel economy are made. These devices have come and gone over the last 50 years, and usually consists of a sealed container in which the spark is forced to jump an additional gap or is partially induced to ground out on its way to the spark plug gap. These devices can also be cleverly demonstrated to produce sparks the human eye perceives as being "more powerful." The only "increase" a gullible consumer can expect from these devices is an undesirable increase in load on their vehicle's ignition system.

SUMMING UP

All internal combustion engines rely on an ignition system — and an engine that is required to produce more horsepower and needs to operate at higher-than-production engine RPM needs a more powerful ignition system to achieve the extra horsepower and higher RPM.

Original (stock) equipment inductive ignition systems with distributors, and direct ignition systems that eliminate the distributor by controlling the ignition system with a computer, are designed to output spark energy moderately in excess of what is needed to fire spark plug gaps under normal operating conditions, and to control timing and spark duration to improve the engine's ability to control exhaust emissions, as well as ensuring the engine is not overstressed during the vehicle's warranty period.

Capacitor discharge ignitions (CDI) such as those from Accel, Crane, Holley, Jacobs, Mallory, MSD and others create sparks that are compressed (and intensified) into shorter duration and are designed to additionally produce the extra spark energy needed by race and modified street engines that will reach higher RPM than stock engines and use fuels more difficult to fire than pump gasoline (petrol). Most CDI ignitions incorporate multi-spark circuits to enable the engine to run smoother under 3,000 RPM.

A High-output inductive ignition system is probably more appropriate than a CDI ignition system for most late model

production engines (modified or not) because this type of ignition provides the longer duration spark needed by these engines. Basic high-output inductive ignition systems are currently available in the aftermarket from at least Accel, Crane, Holley, MSD, and a menu driven direct ignition system is available from Electromotive.

Often, on production vehicles used on the street, replacing a tired ignition coil with a higher-output ignition coil from Accel, Crane, Jacobs, Mallory, Moroso, MSD, Nology, Torque Master etc, can improve ignition performance, particularly under load and at higher RPM.

Electrical devices, including **SPARK PLUGS**, use only the electrical energy necessary to perform the function for which such devices are designed. **IGNITION WIRES are nothing other than conductors**, and whereas an ignition wire's inefficient or failing conductor or insulating jacket (particularly a jacket inside grounded metal sheilding) can reduce the flow of electricity to the spark plug, an ignition wire that allegedly generates an "increase" in spark energy will have no effect on the spark jumping across the spark plug gap, as the energy consumed at the spark plug gap won't be any more than what is needed to jump the gap (e.g. a 25 watt light bulb won't use any more energy or produce any more light if it's screwed into a socket wired to supply current to a 100,000 watt light bulb).

Although most new ignition wires will perform the function of conducting coil output to the spark plug, what is important to sophisticated race engine preparers and owners of production vehicles with exhaust emission controls is **EMI suppression**. All electronic devices can be effected by EMI emitted from ignition wires, and the problem is often exacerbated by installing a high-output ignition system. As late model production vehicles age, engine management sensors and wiring deteriorate and become more susceptible to EMI radiating from improperly suppressed ignition wires. To be truly effective, ignition wires need to be EMI suppressed for a reasonable time, while having the ability to maintain good conductance without overloading other ignition system components.

Engine tuners should also take into account that most stock engines and some hi-tech aftermarket engine management systems use resistance in ignition wires to sense additional information needed by the computer.

MAGNECOR RACE WIRES PROVIDE EFFECTIVE AND PERMANENT EMI SUPPRESSION

Since 1987, Magnecor has recognized that ignition wires capable of conducting the extreme energy output from ignitions available from Accel, Crane, Electromotive, Jacobs, Mallory, MSD and others, all of which are used on engines controlled by electronic engine management systems, need effective and **permanent EMI suppression** to avoid interference to vehicle electronics.

Magnecor Race Wires completely eliminate the need to resort to short-lived carbon conductor ignition wires to overcome the problems caused by EMI on race and performance vehicle electronics from improperly suppressed "low-resistance" spiral conductor ignition wires (with or without conductive coatings over conductor windings). Magnecor Race Wires are also extensively used on both stock and modified production vehicles which need to maintain exhaust emissions within the legal limit.

Unlike its competitors, some of whom have chosen to market cheaper (to manufacture) "low-resistance" imitations of Magnecor Race Wires, Magnecor does not make any claim that their current **KV85 Competition (8.5mm) and R-100 Racing (10mm) Race Wires** have "low-resistance" conductors, nor do the conductors need "low-resistance" for any practical reason. Magnecor does not claim its Race Wires increase horsepower, and any horsepower gained by the use of Magnecor Race Wires results entirely from the ability of the wires to maintain full conductance and suppress EMI that previously stole engine horsepower.

Magnecor Race Wires' **2.5mm Metallic Inductive Suppressed Conductors** are designed to carry the full output from all race ignitions, and are exclusively manufactured in Magnecor's specialized facilities with precision machinery and equipment, and include microscopically close spiral windings wound over ferrimagnetic cores. No conductive coatings are used over the spiral windings. Magnecor Race Wires' conductors are jacketed entirely with the highest temperature aerospace grade silicone rubber to resist the extreme temperatures generated by race engines.

Since first introduced, progressive versions of Magnecor Race Wires have been consistently used by leading contenders all over the world, including those competing in SCCA, NASCAR, IMSA, NHRA and club events in the USA. To date, Magnecor USA has not sponsored any particular racer to promote the use of its ignition wires in competition events. All racers using Magnecor Race Wires do so to ensure their engines perform efficiently and without the risk of EMI from ignition wires ruining the huge effort and expense to prepare and tune engines for competition.

For 21 years, Magnecor has also offered progressive versions of its 7mm and 8mm HIGH PERFORMANCE IGNITION CABLES for carburetor, mechanical and early electronic fuel injected engines. These wires provide RFI suppression similar to the very best offered by Magnecor's competitors in the performance aftermarket, feature a far superior heat resistant jacket, and prices comparable to products sold through speed shops and mass-merchandisers.

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