WHAT IGNITION COIL IS “CORRECT” FOR MY MG TF?

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I gathered this info about TF coils from the TD/TF Workshop Manual, two TF Service Parts Lists, Lucas Batteries Equipment and Spares 1939, Lucas Equipment and Spare Parts 1945–1960, Lucas Technical Courses, and threads on the MG Enthusiasts BBS internet forum.

Two coils were used on TFs

The "correct" original coil depends on when the TF was built.

- Lucas Q12 coils were used in T-ABCDFs until November or December 1954.
- Lucas LA12 coils replaced Q12 coils sometime after TF7973 between late November 1954 and early January 1955.

Lucas Q12

Used until late 1954 (Nov or Dec.)
Painted black case, bitumen solid filled coil.
Taller and smaller diameter than the LA12 coil used in later TFs.

TD/TF WSM: Q12 Service #45020. (see WSM LA12 next page)
Lucas Parts List: Service # 45020A in MG “Midgets” 1946-1954.

I have not found MG documents that define the date or chassis number when Lucas LA12 coils replaced Lucas Q12 coils.

> David Sheward's TF-1500 #TF7427 built 11&12-Oct-1954 had an original Q12 coil
> J C Mitchell's TF-1500 #TF7973 built 12-Nov-1954 had an original Q12 coil.

1) Reproduction Q12: Moss #143-210.
https://mossmotors.com/coil-screw-type-h-t-connection

2) Reproduction Q12: Holden #030.005
https://www.holden.co.uk/p/12_volt_coil_screw_in_lead

3) Reproduction Q12: Retro Ignition
http://www.lucasignition.com/repro-lucas-q12-coil-12volt-45020

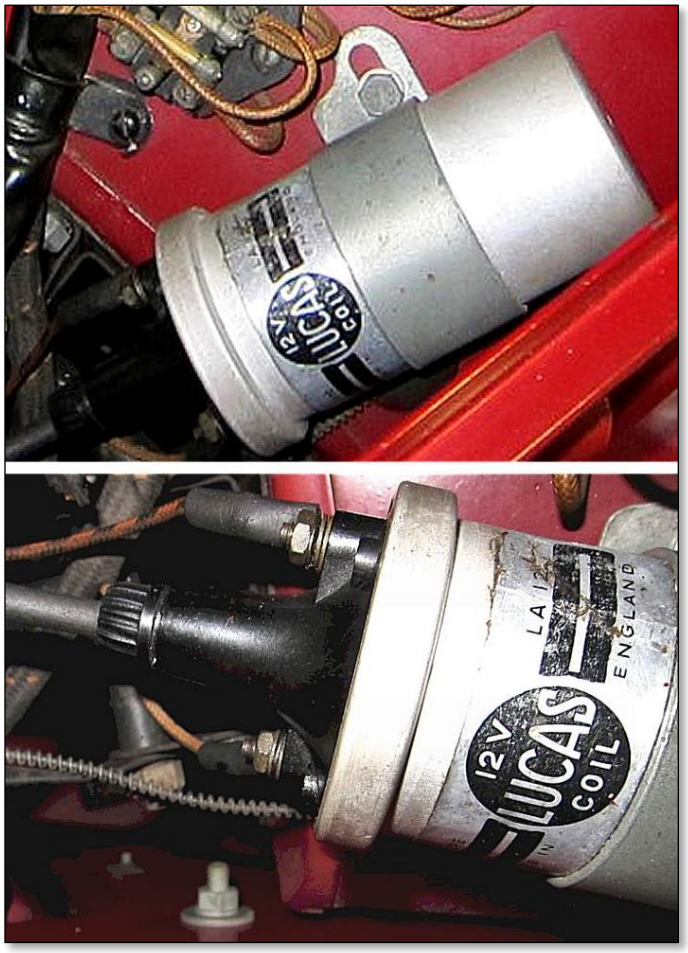
Lucas LA12

First used late Nov-Dec 1954 or Jan 1955 (sometime after TF7973.) Natural aluminum case, oil filled coil. Shorter, fatter, and usually hotter to the touch than Q12 coil.

Lucas Parts List shows Service No. 45053A in MG “Midgets” 1955 only.

I don't know the chassis number and date when LA12 coils were first installed. The WSM states “on later models … LA12 (Part No. 2A536) is fitted as standard.”

> TF9052, built 25-Jan-1955, has the original LA12 coil that was installed at Abingdon. Photos right.



1) Coil similar to LA12: British Parts Northwest #GCL101
https://www.bpnorthwest.com/mg/mg-tc-td-tf/engine-electrical/ignition-coil-w-screw-in-ht-lead.html

2) Coil similar to LA12: Moss #543-020
https://mossmotors.com/coil-ignition-screw-in-coil-wire-aftermarket

3) Coil similar to LA12: Holden #030.004
https://www.holden.co.uk/p/12_volt_coil_screw_in_lead_with_lucas_label

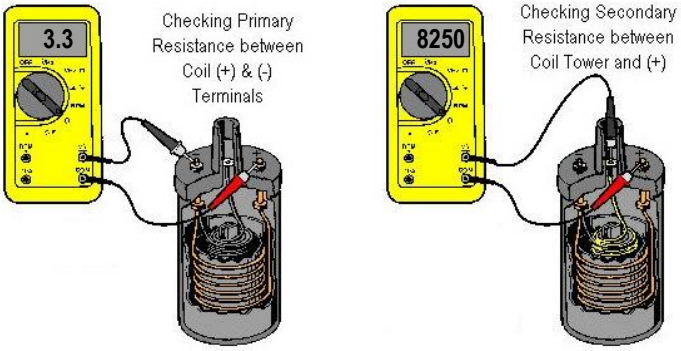
4) Coil similar to LA12: Retro Ignition
http://www.lucasignition.com/lucas-12v-screw-fitting-coil-dlb100

Reproduction metal foil decal for the coil:
Moss #215-630, labeled "HA12"
https://mossmotors.com/lucas-coil-decal

More coil information

Lucas coils for T-series MGs were wound for positive earth, which requires about 10% less high tension voltage. Lucas also made negative earth coils that produced similar spark polarity as Positive Earth coils. They are not in Lucas Service Parts Lists.

The coil for your TF should be a non-ballasted coil. The resistance between the two primary (low tension) terminals on a non-ballasted coil is around 3.2 ohms. The secondary (high tension) resistance between the center high voltage terminal and the + low tension terminal is much higher.



The primary resistance in an internally ballasted coil is around 1.6 ohms.

Coil Science

Resistance reflects of the amount and the gauge of the wire. The late Bob Jeffers posted these resistances and coil science in 2006, 2007, and 2009 on mg-cars.org.uk:

> Q12:	Primary = 4.39 ohms	Secondary = 5,190 ohms
> LA12:	Primary = 3.3 ohms	Secondary = 8,250 ohms
> SA12:	Primary = 2.6 ohms	Secondary = 10,050 ohms
> SP12:	Primary = 3.2 ohms	Secondary = 8,660 ohms

The more important numbers are the inductance of the primary and the secondary. They can tell the turns ratio. The turns ratio determines the output voltage.

The turns ratio is the square root of the quantity: secondary inductance divided by the primary inductance. $\sqrt{[(\text{secondary inductance}) \div (\text{primary inductance})]}$

The turns ratio calculates to:

Q12 = 48.7:1 = $\sqrt{[(26.9 \text{ henrys}) \div (11.33 \text{ millihenrys})]}$
LA12 = 70.9:1 = $\sqrt{[(55.3 \text{ henrys}) \div (11.00 \text{ millihenrys})]}$
SA12 = 85.7:1 = $\sqrt{[(76.3 \text{ henrys}) \div (10.39 \text{ millihenrys})]}$
SP12 = 89.1:1 = $\sqrt{[(64.2 \text{ henrys}) \div (8.09 \text{ millihenrys})]}$

If we assume 400 volts peak on the primary, then the maximum secondary voltages are:

Q12: 400(48.7)=19,480 volts peak
LA12: 400(70.9)=28,360 volts peak
SA12: 400(85.7)=32,280 volts peak
SP12: 400(89.1)=35,640 volts peak

Lonnie Cook
TF7211