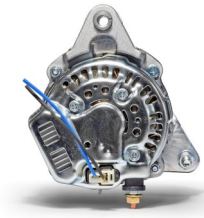
PowerLite

ALTERNATORS

DENSO STYLE ALTERNATOR FITMENT INSTRUCTIONS

IMPORTANT

PLEASE READ ALL THE INSTRUCTIONS WITHIN THIS DOCUMENT CAREFULLY BEFORE COMMENCING FITMENT OF THE UNIT IN YOUR VEHICLE.



IMPORTANT NOTICE

Always disconnect the battery before undertaking electrical work!

Safety First

When undertaking any electrical installation or disconnecting electrical components on a vehicle you must make sure that the vehicle is safe to work on. The battery should be disconnected so that so that short circuits etc can be avoided.

If your vehicle is fitted with a battery isolator switch, then turn the switch to the disconnect position. You may test that the power is isolated using a multi meter measuring supply voltage to the alternator or starter connections.

When isolating the battery on a vehicle without a master switch please disconnect the battery earth cable first and then the positive supply cable. Making sure that both cables are isolated from the electrical system. Again a multi meter can be used to check voltage at the alternator or starter making sure no power is present.

Once you have undertaken the process above and are confident that the unit being replaced has any power supply isolated, you may move on to the removal of the unit.

Firstly, remove the main power supply lead or three pin DIN/EURO plug. If the unit is of a stud type design you will need to remove the additional cables from the unit, making sure that you mark clearly the connection points on the cables, D+, W, IGN etc depending on the original unit being replaced.

Then you will need to slacken off the adjustment arm on the unit, to remove the fan belt. Most have a slot type adjustment arm which will require slackening off the bolt attached to the alternator side and allowing the unit to pivot loosening the fan belt tension.

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Before fitting a replacement Powerlite alternator, please:

Check all connections and cables.

Check main battery cable is rated to that of the alternator output.

Ensure the fan belt is tensioned correctly.

Ensure the fan and pulley can run freely.

DO NOT CHECK WHILE THE ENGINE IS RUNNING!

Ensure that the battery is fully charged before reconnecting.

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Many electrical faults are misdiagnosed, leading to the unnecessary change of the alternator. Faults that do not originate from the alternator, or cause the alternator to fail, will result in the subsequent failure of **any** replacement alternator.

Therefore, please closely examine your old alternator and its fitted position for any of the following:

Loose or broken connections within connector plugs

Damaged cables to the unit, worn cabling grommets etc

Burnt terminal connections (due to loose / incorrect connection)

Burnt or over-heated (solid) pulley. Red or blue burn marks around the pulley will indicate this, usually caused by a worn fan belt or incorrect tensioning.

The unit mounted in a position where coolant or oil leaks have been leaking onto the casing. This will cause internal damage to the units components if not rectified. Coolants and engine oil have corrosive properties and can damage electronic components internally.

If your old alternator or its installation exhibits any of the above symptoms, fitting any replacement alternator will not solve the problem! Our alternator will fail on the vehicle for the same reasons, and unfortunately the unit will not be covered under warranty.

Please contact us if you're not sure.

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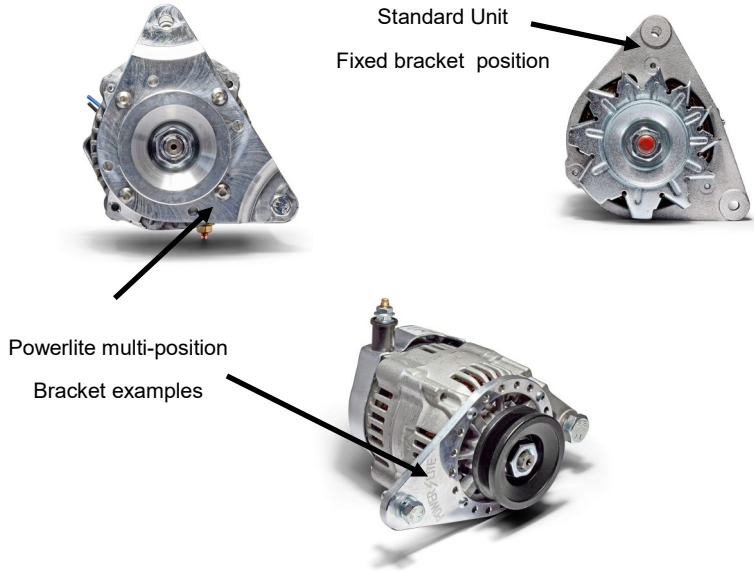
With the belt now removed, you can start to remove the fixings holding the unit in place. Again taking care noting the bolt positions.

Remove the original unit and replace this with the new Powerlite alternator you have purchased. To start just hand tighten all the fixing bolts so that the unit can be pivoted to adjust the fan belt tension.

Please note: If the new unit supplied has a multi position type adjusting bracket this must be positioned relative to the original units bracket position that has been removed. This will allow the adjustment arm to align correctly.



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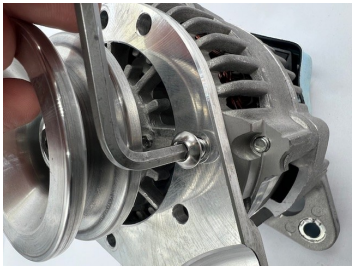
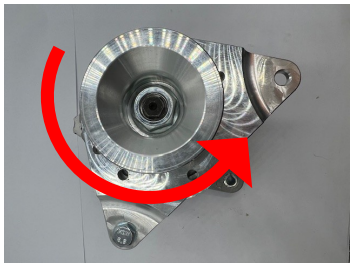
If you are adjusting the bracketry on the new alternator, use the supplied allen key to remove the domed headed bolts holding the bracket to the alternator body. Then rotate its position relative to the original alternator. This will allow the original adjusting arm to align with the bracket.

In some bespoke fitments the bracket maybe positioned differently, but in doing so it may then be necessary to manufacture a new adjusting arm relative to the brackets new position on the unit.

When refitting the bracket to the alternator it is advised that a non permanent thread locking compound is used (loctite) on the threads of the domed headed bolts to stop them vibrating loose in operation.

The pictures below shows the bracket and allen bolt arrangement on a RAC068 unit, this showing how the bracket can be rotated so that the unit can be fitted in a right or left hand orientation





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With the unit fitted and all electrical connections completed on the vehicle, it is now time to reconnect the battery or switch on the battery isolator switch if fitted.

It is now time to check operation from inside of the vehicle.

Follow the instructions below:

- Turn on the ignition switch checking to make sure that the battery warning lamp lights up.
- Crank the engine until start up
- Does the warning lamp extinguish on start up of the engine?

If the lamp goes out, then the unit is charging correctly and the cabling to the unit is correct. If the lamp stays on you will need to check both connections in the white plastic connector at the alternator, making sure the Blue/White cable (dependant on connector loom used) is connected to the warning lamp and the Black/Yellow has a 12v positive supply when the ignition is switched on. The Red main pole connection should have a constant 12v supply regardless of ignition switch position.

If all operational checks are OK, with the engine running make a secondary check of the belt alignment with the engine running, making sure that the belt is running true and in line with any associated pullies.

If all OK after switching off the engine recheck all fixing bolt tightness, re-torque any bolts as required.

It is recommended to recheck the belt tension after 10miles of use.

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Now you have the new unit aligned and fitted in place, it is best to check the pulley alignment, making sure that the alternator pulley runs in line with the crank and any other ancillary pulleys fitted to the vehicle. This can be conducted by using a straight edge, ie ruler across the face of the crank pulley running this in line with the alternator pulley. If the alignment is correct then you may proceed to fit the fan belt over the pulleys and proceed to tension the fan belt.

The belt tension is tightened by sliding the adjuster fixing bolt along the tensioning bracket slot until the correct belt tension is achieved.

When you are happy with the belt tension proceed to tighten all the fixing bolts holding the unit, including the adjuster bolt. A nominal torque of around 20—23Nm should be applied if using a torque wrench to tighten these (based on 8mm thread)

Once all tight a simple check of tension can be carried out as follows. At the mid point of the longest stretch of belt you should be able to twist the belt, with slight difficulty, by around 45 degrees. Too much tension will load bearings and can cause premature failure, too loose and the belt will slip or in worst case could jump off in operation.

If in doubt please take advice from suitably qualified mechanic or contact our technical team for further assistance regarding the correct tensioning of the alternator drive belt.

Always run the vehicle then recheck the belt tension after running to make sure that the belt is tensioned correctly. A secondary check is required later once the vehicle has been driven.

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As another example the RAC065 has a single lug bracket allowing rotation of the bracket to a position which suits its adjuster arm. The same principle in adjustment applies when removing and rotating the bracket.

The allen key bolts are removed and the bracket rotated to its defined position in its application.

The picture below shows the single lug bracket.

As can be seen from the picture the bracket can, if required, be rotated 360 degrees around the nose of the unit for ultimate flexibility in the bracket positioning.

ALWAYS *be aware that positioning of the bracket must be so that the unit is supported correctly and not susceptible to vibration caused by the engine when running. Excessive vibration can lead to fatigue and breakage of the bracket.*

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Supplied with your new alternator unit you will have been provided one of the two below supplementary connection cables.

Our RAC902 (shown below)

Please note the 12v switched ignition supply and the warning lamp connection wires. If using this connection you will need to integrate this into the vehicle loom. It is recommended that this is conducted by a qualified Auto Electrician

Plus our RAC903 (shown below)

The RAC903 connection cable has a direct connection to the vehicles wiring loom if the original unit had the DIN type (Euro) connection already connecting to the alternator (ACR type alternator originally fitted).

One of the above cables will be used in your installation depending on the unit application, either new build where you will integrate the RAC902 connections into the vehicles existing loom or if fitting

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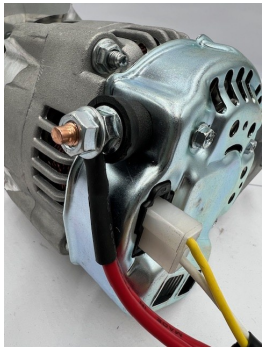
the unit as a replacement for the an original ACR type alternator you will use the RAC903 connection loom.

When using this you will connect the black three pin male spade block connection directly to the vehicle wiring loom attaching this to original alternator plug. These will connect directly together.

The two pin white terminal is connected into the two pin terminal block at the rear of the alternator and the red 6mm ring terminal is then connected to the 6mm main battery cable post that protrudes from the side of the unit. This provides power to the alternator and connects the warning lamp circuit.



Please see picture to the left showing both connections fitted into the alternator.

The red cable—main supply

White block connector—warning lamp and switched ignition supply

This will leave the long yellow wire which will need to be connected to a switched ignition feed. Please note that this **MUST** be a switched feed that becomes live with the ignition turned on. It **CANNOT** be a constant live feed. Connecting to a constant live will cause a parasitic drain on the battery when the vehicle is switched off. This will result in a flat battery if left and can cause internal damage to the unit.

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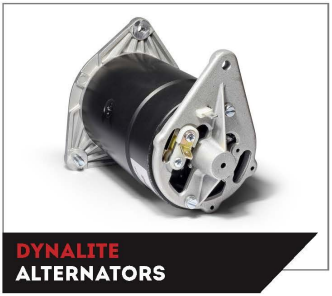

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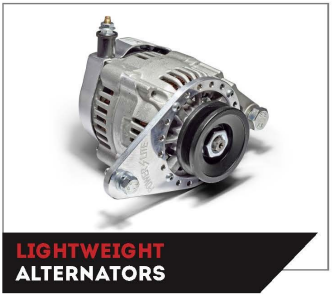
ALTERNATORS



LIGHTWEIGHT
ALTERNATORS

REMANUFACTURED
WIPER MOTORS

ACCESSORY
RANGE

THERMAL
HEAT SHIELDS

If you have any questions at all about our products and fitting, please don't hesitate to contact us.

PLEASE SEE OUR WEBSITE FOR THESE AND MORE

www.powerlite-units.com

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