Landcruiser Accumulator / Spheres Fitting guide

Fitting, Setup & Testing for the = (Comfort / Comfort Plus / Sports Kits)

Warning
Never try to undo any part of the Sphere unit they do not come apart!!!
Never over Tighten the Spheres when fitting = you will damage the threads!!!

Providing nothing has been adjusted on your vehicle since it was factory setup then you should only need to fit the spheres & bleed the system as below (Section 1)

But if the front Torsion Bars or the height sensors have been adjusted in anyway then you will need to Fully Set the system back up to work correctly = see below (Section 2)

Testing the Spheres = the only true way you can test the spheres is with a sphere pressure tester - there is no other way except road test for the comfort of the ride which is no way accurate! Also the suspension pressure will not tell you anything about the condition of the spheres or the amount of fluid used from low to high used! But low reservoir level is normally a good indication that the spheres are going or gone!

Other Items you will need
2.5 to 5lts. of Genuine Toyota AHC fluid to bleed the system correctly
WD40 = Spray on the old sphere nuts a few days before trying to remove them in some countries where rust is an issue also at the same time on the bleed nipples
10mm Spanner to loosen the Bleed Nipples
Container to catch the AHC fluid
Large Syringe to empty the header tank
Small Scissor Jack – maybe needed to fit the front spheres if the room is tight
Bleed Hose – supplied in the kit
To remove the old Spheres a 36 mm open ended spanner is supplied with the kit

For Full Setup under Section 2 you will also need
To set the AHC Sphere pressures you will need either an IT2 Tester, a VCI interface or a set of pressure gauges that can read around 1500 psi with short hoses say 300mm with M7x1.0 mm Bleed nipple size fittings on the ends to fit in the bleed nipple holes on the Sphere Actuators = Note: if you are using a Toyota hand-held tester IT2 or VCI interface - the pressure is only estimated from the pump pressure sensor! Pressure Gauges are more accurate!

Front Torsion bar adjustment is only used to correct the front AHC suspension pressure & the level between the PS/DS - they do not adjust the height of the vehicle! The Front & Rear height sensors control the height of the vehicle via the front & rear hydraulic rams which look like shocks!

½" or ¾" 30mm Socket & Long Wrench Bar to adjust the torsion bars
2x 10mm spanners to adjust the height sensors

SECTION 1

Just fitting the Spheres Kit & Bleeding the System

A: Start engine, set the vehicles height selector switch AHC to the Lowest setting once the vehicle has finished dropping to the lowest position switch off engine ignition

B: Discharge the suspension pressure at the Spheres bleed nipple plugs with the use of a hose & container release the suspension fluid (Slowly as there is still High Pressure) Note: the vehicle will drop in height by 25 to 50 mm

C: Spray the Sphere Nuts with WD40 & Loosen the original spheres with the 36 mm open ended spanner, unscrew & remove each sphere & fit the new as you remove the old ones use a little AHC fluid over the O ring seal to lubricate the seal
(((WARNING do not over tighten the spheres they only need to be gently / just tight no more!!!)))

You will need to use a small scissor jack between the chassis & the inner sill when fitting the front spheres to give you an extra 10 mm gap to get the new sphere in due to limited space! When tightening the new sphere you need to gently tighten / just tight - do not over tighten!!!

D: Next Siphon the AHC header tank fluid until it is near empty, now fill the tank with New Toyota AHC fluid nearly to the top, Start the engine & bleed each sphere Actuator starting at the front FPS then FDS, RPS & finally RDS until the fluid runs clear at all 4 - topping up the reservoir tank as you need to, once all 4 are bleed select the High position - the header tank level should drop down between the Max & Min marking top up or remove to correct level

E: Now lower the suspension to the Low position once reached select High position & repeat a couple of times to remove any air in the system - recheck header tank level at the last High position before selecting the Normal position

F: Check for any leaks - if all is ok take vehicle for a test drive = Done

SECTION 2

Fitting Spheres Kit & Full Setup of the AHC System, Torsion Bars & Sensors, etc.

A: Unload the vehicle if there is any extra or heavy items in the vehicle also there should be no one sitting in the vehicle to do the work/tests etc....

B: Start engine, set the vehicles height selector switch to Low once the vehicle has finished dropping to the lowest position switch off engine ignition

C: Discharge the suspension pressure at the Spheres Actuators bleed nipple plugs with the use of a hose & container release the suspension fluid (Slowly there is still High Pressure) Note: the vehicle will drop in height by 25 to 50 mm

D: Spray the Sphere Nuts with WD40 & Loosen the original spheres with the 36 mm open ended spanner, unscrew & remove each sphere & fit the new as you remove the old ones use a little AHC fluid over the O ring seal to lubricate the seal
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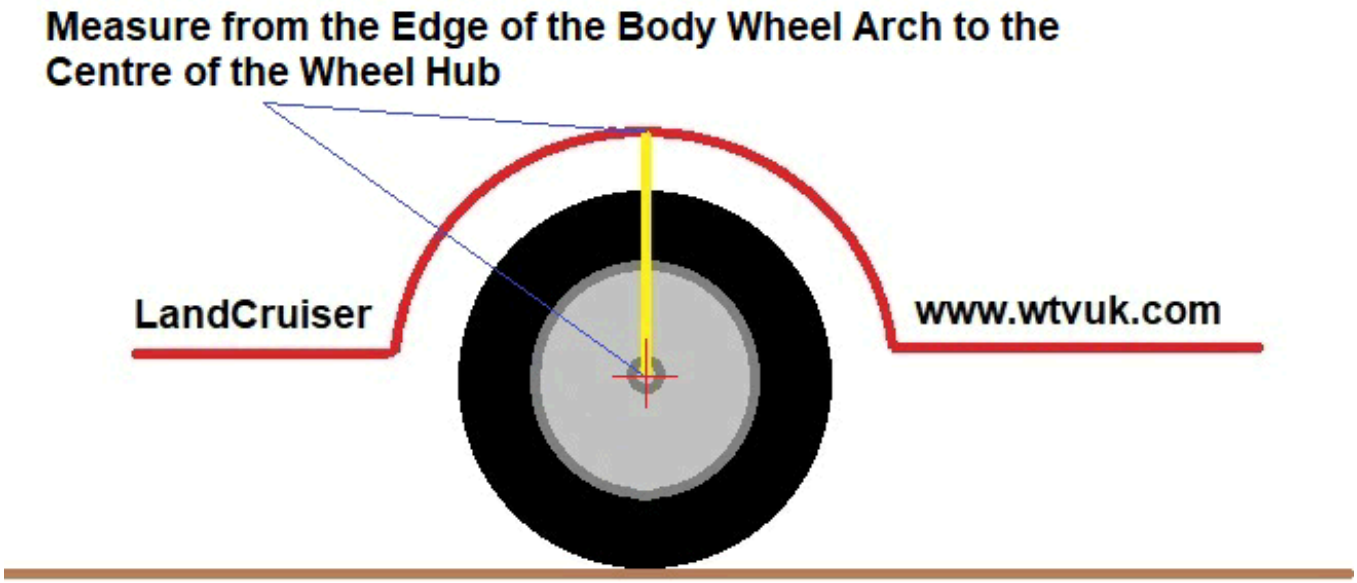
HEIGHT & ADJUSTMENT



Measurements must be done on even level ground

Front = 495mm / 19.5"

Rear = 520mm / 20.5"

Next check the suspension height from the edge of the wheel arches to the centre of the wheel hub with the vehicle in the normal height position N & on even level ground – (see diagram above)

(Warning: it is advised to switch the engine off & open a door while you are adjusting the height sensors & when you are under the vehicle, once you are clear you can restart the engine to see the changes!!!)

If the height is incorrect then you need to correct it by the height sensors front & rear

The Rear is adjusted by a single rear height sensor connected to one of the upper link bars that connects to

the rear axle (see diagrams below) one end slides in the slotted bar this is the end you adjust with the 2x 10mm spanners & some WD40 if required

The Front sensors are adjusted on the small threaded link bars & both must be adjusted by the same amount each side of the vehicle

AHC SYSTEM PRESSURE

Using Gauges

Lower the suspension to the lowest position & switch of the engine, Discharge the suspension pressure at the Spheres Actuators bleed nipple plugs with the use of a hose & container release the suspension fluid (Slowly there is still High Pressure) Note: the vehicle will drop in height by 25 to 50 mm

Remove one of the front bleed nipples and fit a Pressure Gauge with hose adapter in to the bleed nipple plug hole for testing the suspension pressure, etc..

(Note: Steering must be straight & you only need to do one side of the vehicle as = both rear spheres are joined & both front spheres are joined while the steering is straight! if you have 2 Gauges fit = one on the rear & the other on the front - saves a lot of time, etc.)

Pressure gauges will read Low, Normal & High pressures correctly

Using IT2 or VCI Interface

If you are using an IT2 or VCI tester then plug in under the dash & run or switch on software
(Note: IT2 & VCI pressure is only correct when raising from low to normal only it is not correct from high to low or when making adjustments!)

READING PRESSURES & ADJUSTMENTS

Start the engine & select the Normal Ride position (N) once at the normal position make a note of the pressure gauges or IT2/VCI tester readings, if your suspension is still as factory set? The Pressures should read as follows

Front suspension pressure on Gauges = 825psi +/- 43psi
Front Suspension pressure on IT2 or VCI tester = 6.9Mpa +/- 0.5Mpa

Rear suspension pressure on Gauges = 640 to 800psi
Rear Suspension pressure on IT2 or VCI tester = 5.6 to 6.7Mpa

Rear suspension pressure with extra rear sub tank on Gauges = 680 to 840psi
Rear Suspension pressure with extra rear sub tank on IT2 or VCI tester = 5.9 to 7.0Mpa

(Note: the Rear suspension pressure cannot be adjusted only the height as the rear springs are fixed non adjustable if the springs are in good condition & the height is correct then the suspension will read as above, if the springs are old then the pressure will be higher)

If the front pressure is incorrect then the torsion bars need adjusting as follows

1: Run the engine & select the Normal height position, first check the F-PS & F-DS height are the same height if there is a difference then increase or decrease one side torsion bar to correct the level

2: Next if the front pressure is to high then you need to screw in tighten the Torsion Bars equally both sides by 1 turn at a time, this will lower the suspension pressure - repeat until the front pressure is correct

3: If the front pressure is to Low then you need to screw out loosen the Torsion Bars equally both sides by 1 turn at a time = this will increase the suspension pressure - repeat until the front pressure is correct

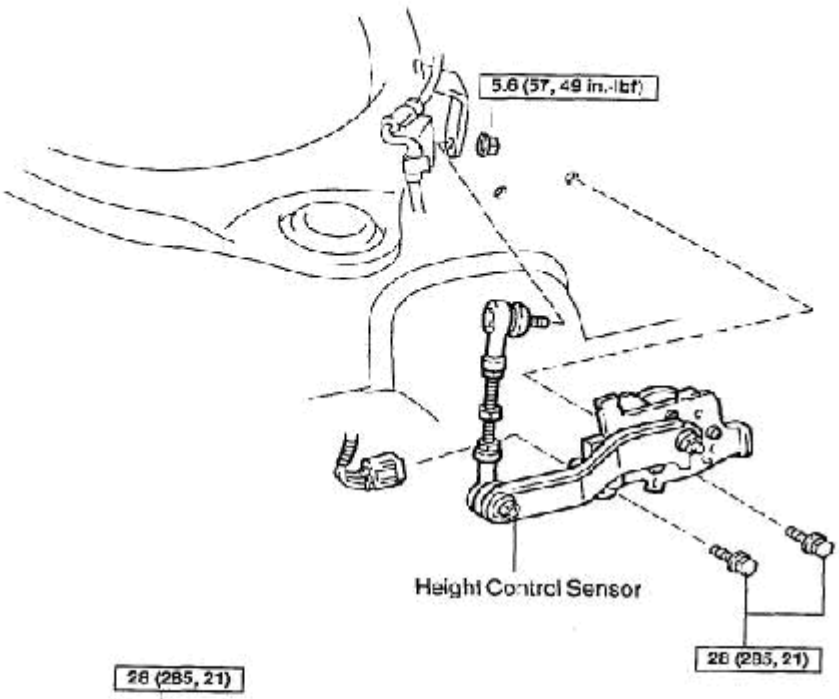
4: If the rear pressure is too high then it is likely you have extra weight in the rear of the vehicle or the rear springs are worn, you cannot adjust the rear pressure without putting the rear height out!!!

5: Next take the vehicle for a short drive to settle the suspension & re-check the pressures also the height & level to confirm they are all correct or readjust!

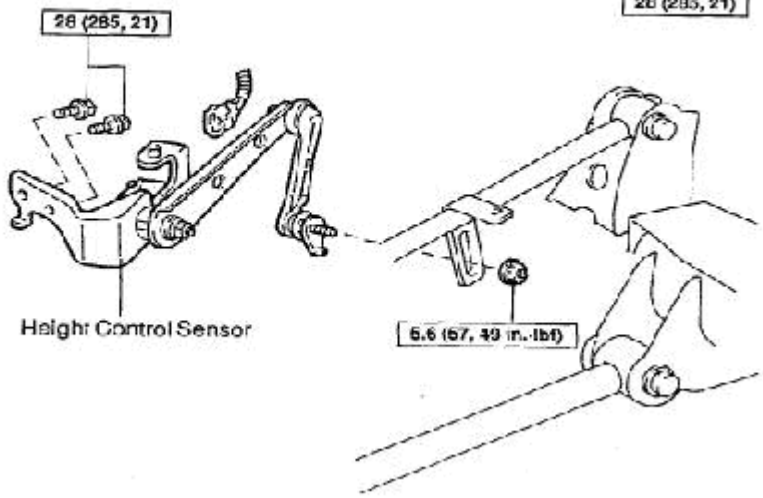
6: Run the engine & select the High Position – check the header tank level is at the maximum mark & also check for any leaks - if all is ok take vehicle for a test drive = Done

Note: if you are using a IT" or VCI tester check steering angle position is correct, also front height sensors at N normal height are both reading near Zero if they are far out the front ride height will keep changing!
See website Landcruiser Info pages for other information & guides, etc… www.wtvuk.com

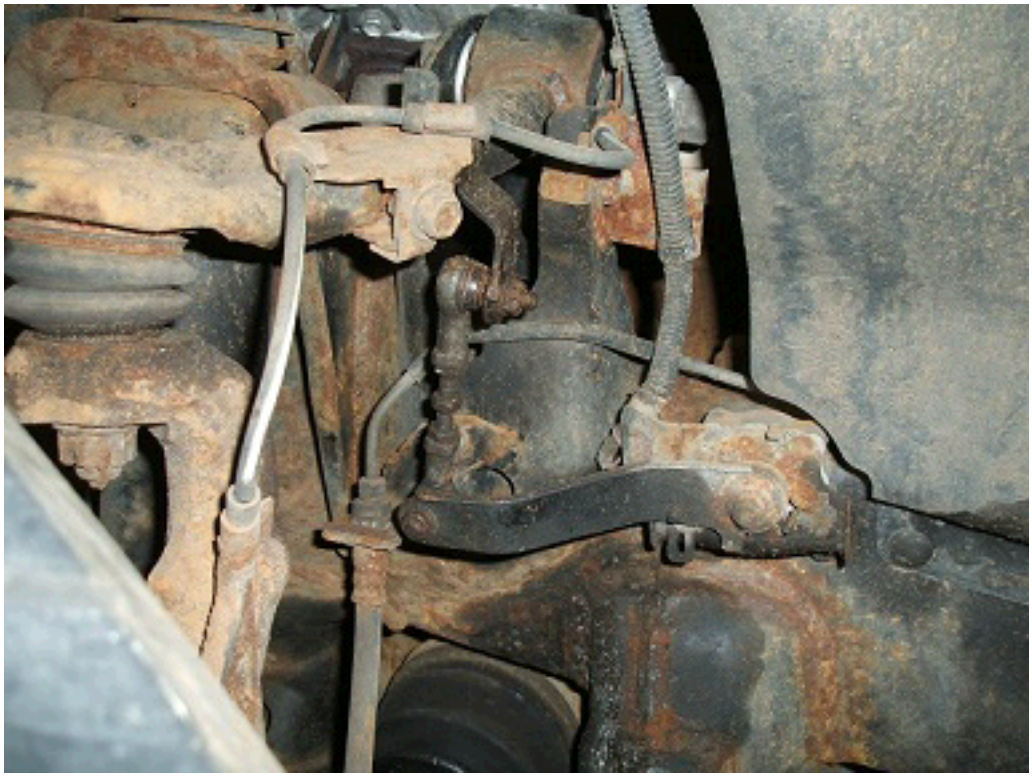
FRONT



REAR



FRONT HEIGTH SENSOR



REAR HEIGTH SENSOR

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