
TATA TIAGO AND AERIS

iCNG TWIN CYLINDER

SUPPLEMENT

(This manual should be read in conjunction with
Tiago and Aeris Owner's Manual)

Part no. 549158409902

TATA.CARS

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SUPPLEMENT FOR ICNG

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1. INTRODUCTION TO CNG

CNG (COMPRESSED NATURAL GAS) is principally constituted of Methane. CNG is a colorless, odourless and non-toxic gas. But, it is inflammable and lighter than air. Due to its low density, CNG is compressed to up to around 200 bar to increase storage capacity. CNG has the following benefits.

Benefits of CNG

- CNG is a clean burning fuel and has lesser tail pipe emissions than compared to gasoline.
- CNG offers lower running and maintenance costs compared to gasoline.
- CNG does not contaminate and dilute the crankcase oil during combustion and hence oil in the engine does not lose its properties which can lead to early wear and tear of engine parts.

WARNING

- In case of any symptom of CNG leakage, releasing noise, or external damage to CNG pipe/components during an accident, do not panic.
- Stop the vehicle, switch off the engine and open all doors. Close the CNG cylinder manual shut off knob located on the cylinder valve.
- Do not run the vehicle even in petrol mode.
- Contact the nearest TATA MOTORS authorized service centre immediately for further assistance.

NOTE

The Images / Illustrations in this owner's manual are only for reference. It may defer with actual vehicle.

2. SAFETY PRECAUTIONS

To get the best out of CNG fuel, the vehicle must be serviced as per the service interval given in this manual.

DO'S

- Always get the car repaired / serviced at TATA.CARS Authorised service centre only.
- Remove the CNG tank during any welding / brazing work on the Car. This has to be done by TATA.CARS Authorised Service Centre only.

NOTE

- *In case of gas leakage in the low pressure circuit (Regulator to CNG Rail), ECU will automatically switch the fuel mode from CNG to Petrol. The ECU will not allow you to switch to CNG mode until the leakage is rectified.*
- *Leakage in high-pressure line from CNG Tank to High-pressure regulator will not be monitored/detected.*

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- Keep the car away from any Fire source.
- Switch Off engine while fuel filling CNG or Petrol.

NOTE

- *After refilling CNG, ensure that the Fuel Lid is properly shut (Otherwise vehicle cannot be started).*
 - *Ensure that your car has sufficient petrol in tank to keep both the systems in healthy condition.*
- If the vehicle doesn't change over to CNG mode when the changeover switch is pressed,
 - a. Ensure that the manual valves on CNG cylinders is open.
 - b. Check CNG Level on instrument cluster.

If both conditions are ok, and the car is still not changing over to CNG, have your vehicle checked by

TATA.CARS Authorised Service Centre.

- Test the cylinder every three years (or as specified by the government) from the last date of testing/retesting of the cylinder by authorized cylinder testing agency (Refer CNG VIN plate).

DONT'S

- Do not install an LPG, Propane or any other cylinder in place of CNG cylinder. It is illegal and unsafe.
- Never fill CNG cylinder with air, LPG or any fuel except CNG.
- Never alter CNG system configuration. Do not adjust / tamper CNG system settings.
- Never place inflammable explosive, corrosive material or sharp objects near CNG cylinder.
- Don't smoke inside or near the CNG vehicle

- Do not over fill the CNG cylinder beyond its capacity. Over filling the CNG cylinder can cause safety issues like gas leakage.
- Do not use high pressure washer fluid / water jets at electrical devices & their connectors during washing.
- Do not start/drive your vehicle in case of CNG leakage. CNG is inflammable and highly explosive. This may lead to serious injury.
- The CNG cylinder assembly should not be repaired, under any circumstance. In case of any problem contact nearest TATA.CARS Authorised Service Centre.
- Do not change the colour of the CNG cylinder.
- Do not park your CNG vehicle on grass /saplings / over flammable material this may tent to catch fire.

- Do not press the accelerator pedal while changing over from petrol to CNG mode.
- No flammable material should be stored in the close vicinity of the CNG cylinder.
- Never use naked flame / fire for checking gas leakage.
- Do not turn off any CNG cylinder valve while re-filling the CNG gas and during running of the car excluding the emergency situation like gas leakage/during service repair etc.
- Do not overtighten cylinder valves knob while closing or opening.
- Never attempt to carry out any repair work or tamper with the CNG components on your own or by any unauthorized personnel.

3.STARTING THE ENGINE

NOTE

Vehicle will start by default in CNG mode except when there is a manual intervention by fuel mode switch. During default CNG start If set conditions are not met vehicle will start in petrol mode and then switch over to CNG mode once set condition are met.

- To start, turn the ignition key to “IGN” position. Ensure that all the tell tales should glow for initial 3 seconds.
- Select the desired fuel operating mode by pressing the Fuel Selector Switch.
- Keep the clutch pedal fully pressed and crank the engine. Do not press the accelerator pedal.
- If the engine cranks but fails to start then repeat the above procedure. Release the key as soon as the engine starts. Ensure that the “MIL” and ‘SIL’ lamps are “OFF”. The CNG

indicator lamp will be ON, if the car is running on CNG mode.

NOTE

- Irrespective of the position of the fuel selector switch (Petrol or CNG), your car's engine will start using petrol based on the programmed warming up condition and later switch over automatically to CNG (if CNG mode is selected).
- Ensure that your car has sufficient petrol in the tank as petrol is used for starting until the engine warms up.
- Ensure that you run your car in “PETROL” mode for at least 10kms for every 300kms covered in “CNG” mode to ensure proper working of petrol fuel supply system.

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4. FUEL MODES

There are two fuel modes in the vehicle, one for petrol and the other for CNG. Desired fuel to operate can be selected using the selector switch which is located on the dashboard.



A. Petrol to CNG mode

You can shift to CNG fuel mode by pressing the fuel selector switch. The “CNG” lamp on the instrument cluster starts flashing during the changeover to CNG mode and glows permanently after changing to CNG mode indicating that the car is running on CNG.

B. CNG to Petrol mode

Similarly you can switch to PETROL fuel mode by pressing the fuel selector switch. After successful transition to PETROL mode, the green “CNG” lamp goes OFF. This indicates that the car is running on petrol.



Important points

- Fast flashing of the ‘CNG’ lamp on instrument cluster indicates the fault in CNG system. Car will automatically switch to Petrol mode. Get the car checked / repaired at the nearest TATA.CARS Authorised Service Centre.
- Very Slow flashing of the ‘CNG’ lamp indicates the empty tank / No CNG supply (loss of pressure). Get the CNG tank refilled.

5. INSTRUMENT CLUSTER

Option I:



NOTE: All indicators shown may not be applicable to your vehicle. Above image is only for reference.

SUPPLEMENT FOR ICNG

Option II:



NOTE: All indicators shown may not be applicable to your vehicle. Above image is only for reference.

A. CNG fuel gauge



When the ignition switch is in “ON” position, CNG fuel LED gives an approximate indication of the amount of CNG fuel in the CNG Cylinder. “F” stands for full and “E” stands for Empty.

When CNG fuel in the CNG Cylinder is near to empty position, CNG low fuel Text warning and Chime turns ON for 4 Seconds. Refill the CNG Cylinder as soon as possible.

If CNG fuel is not filled even after CNG Low fuel Text warning and Chime, then First bar in CNG fuel gauge will start blinking to indicate more severe CNG low fuel warning.

NOTE

When the ignition switch is in the “ON” position, this gauge gives an approximate indication of the amount of CNG fuel in the CNG Cylinder, and it takes few seconds to stabilize after the ignition is turned ON.

WARNING

- Running the CNG fuel tank too low or empty can cause engine to stall and could endanger user and passengers. User must stop and obtain additional CNG fuel as soon as possible after CNG low fuel Text warning and chime turns ON.
- CNG Indicator symbol shall blink if there is any fault in the CNG system. Take vehicle to the TATA.CARS Authorised Service Centre if the symbol starts blinking.

B. Audio Reminder

CNG Low Fuel Chime

CNG Low Fuel chime will turn ON for 4 seconds to alert user about CNG low fuel in CNG cylinder under following condition,

- When CNG fuel bar state changes from 2nd bar to 1st bar (Empty) or 1st bar to 1st bar blink.
- When engine fuel mode is changed from CNG to Petrol during 1st bar blinking in CNG Fuel Gauge.
- During IGN ON, 1st bar blinking in CNG Fuel Gauge.

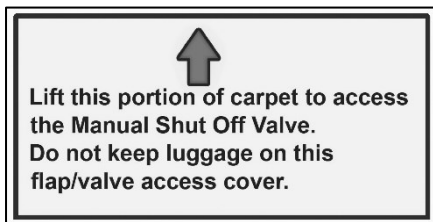
SUPPLEMENT FOR ICNG

C. Driver Information System

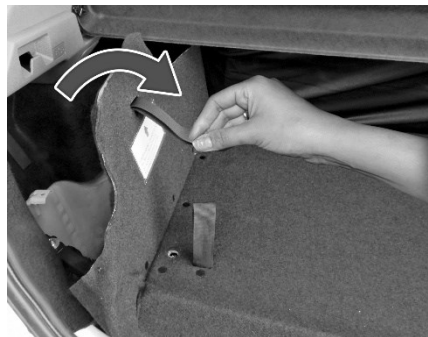
Driver Information	System Image	Description
CNG mode active		CNG MODE ACTIVE” text warning comes ‘ON’ for 4 seconds when CNG Fuel Mode is selected.
Close fuel lid		CLOSE FUEL LID” text warning comes ‘ON’ when Fuel Lid is open.
CNG low fuel		CNG LOW FUEL” text warning comes ‘ON’ for 4 seconds when CNG fuel level is low

6. CYLINDER MANUAL SHUT OFF KNOB

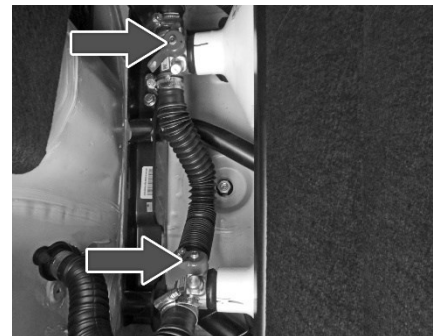
Instructions for how to access manual shut-off valve are given on the sticker.



Fold the rear seat backrest and then lift the left carpet flap to access manual shut-off valve.



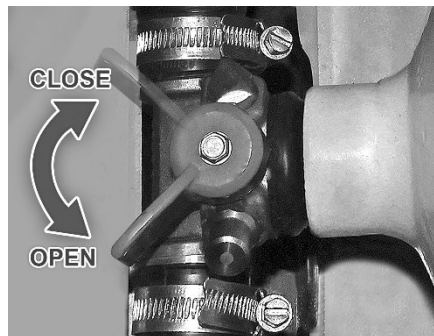
A manual shut OFF knobs are fitted on cylinder valves and mounted on CNG cylinder.



Manual shut OFF Knob Operation

CNG supply can be cut OFF by closing the manual shut OFF knobs.

SUPPLEMENT FOR ICNG

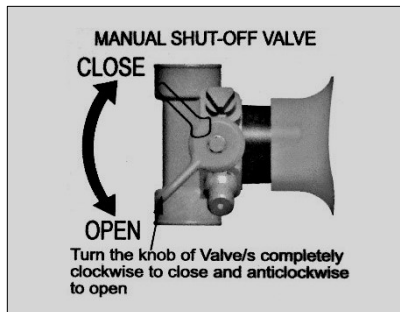


Valve Closing: Turn the both cylinder knobs completely in clockwise direction to close the CNG supply to engine. Do not overtighten cylinder knobs while closing.

Valve Opening: Turn both cylinder knobs completely in anti-clockwise direction to open the CNG supply to engine. Do not overtighten cylinder knobs while opening.

Instructions for ON/OFF valve operation are given on the sticker.

Sticker is provided in front of the valves on vehicle.



NOTE

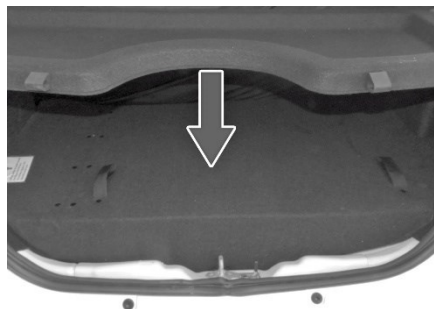
The above image is for reference purpose only

NOTE

- If the manual shut OFF knobs are in closed condition, it is not possible to fill CNG into the cylinder.
- If the manual shut OFF knobs are not opened fully, then the engine may not run properly.

WARNING

- Never remove the cylinder valves from the cylinder assembly, for any assistance, contact TATA.CARS Authorised service Centre.
- If removed, ensure it is refitted with new Teflon tape. Apply Teflon tape layers on threaded neck of cylinder valve in clockwise direction. (Swagelok make Teflon tape MS-STR-8, 12.7 mm width is recommended, and no. of turns should be minimum 6).
- Even if the CNG from cylinder is consumed till the engine stops, some amount of CNG will be left out in the tank under pressure.
- Always keep the manual valves in closed position when the vehicle is parked in confined and / or closed parking space like a basement parking.

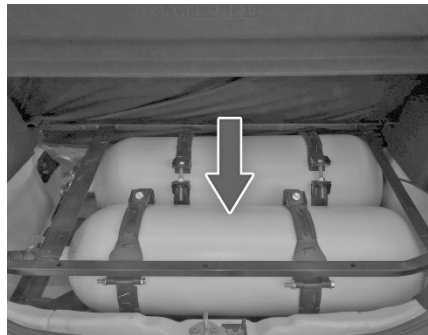


WARNING

Do not carry weight more than 50 Kgs in luggage compartment

7. CNG CYLINDER

The CNG cylinders are located in luggage compartment. CNG is stored at a high pressure of 200 bar.



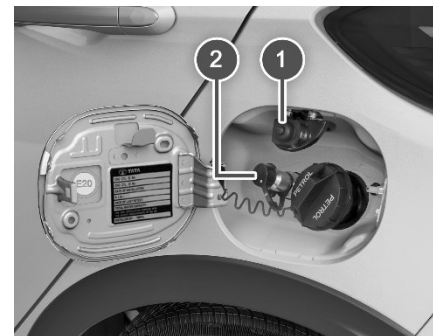
CNG cylinder testing station

Refer below link for the list of approved CNG cylinder testing station

<https://peso.gov.in/web/en/approved-cng-cylinders-testing-station>

8. CNG FILLER VALVE

CNG filler valve is used to fill CNG in the cylinder. It is fitted near petrol filling location. CNG should be filled by CNG filling gun at filling station. Filling automatically cuts off when the cylinder pressure reaches the CNG filling station dispenser pressure.



1. Fuel Flap Switch

2. CNG Filler Cap

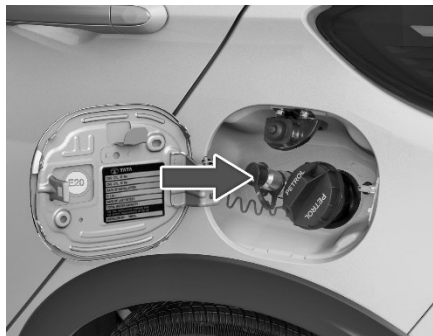
SUPPLEMENT FOR ICNG

NOTE

- Keep the Ignition switch in "OFF" condition during CNG refilling.
- Do not use your mobile phones when you are at a filling station.

Filling Procedure

- Open the fuel lid.
- Remove the receptacle dust cap by pulling it off from the receptacle gently before filling and ensure to refit dust cap after refilling

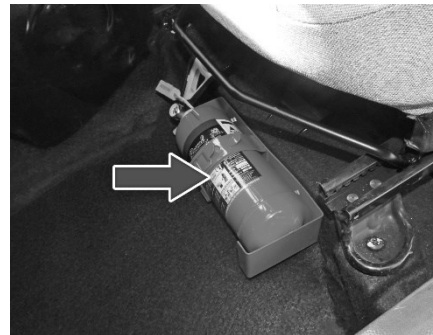


- CNG filling gun to be docked on to the receptacle.

NOTE

- Fascia switch CNG function green LED blinks continuously when fuel Lid is open, vehicle will not start until fuel lid is closed properly.
- Green LED will continuously blink along with a text message "close the fuel lid" on cluster until fuel lid is closed.

9. SAFETY REGULATION: FIRE EXTINGUISHER



Near Co-driver Seat

Method of operation:

- Fire Extinguisher is mounted near co-driver seat with the help of toggle clamp bracket.
- Pull the clamp operating clip. Hold the Fire extinguisher lever and pull it from the bracket
- Check if the pressure gauge needle is in green zone.

- Hold the Fire extinguisher upright. Break the plastic seal. Pull the pin and remove the safeguard block from the lever.
- Position the nozzle towards the flames.
- Press the lever and direct discharge at base of flames with rapid sweeping motion.

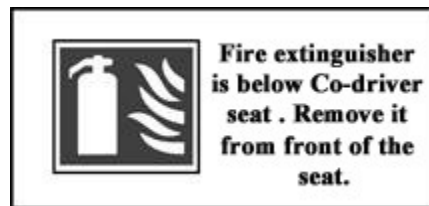
Maintenance

Check pressure on the gauge every week, needle should remain in green zone. If it comes to red zone, please refill it.

The Fire Extinguisher should be refilled every three years even if it is not used.

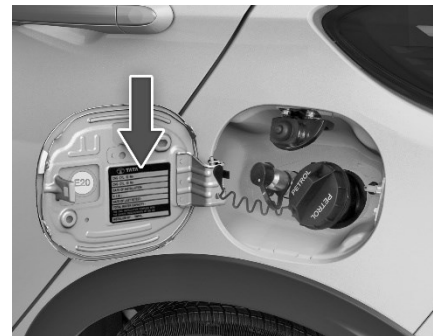
Fire Extinguisher Sticker

Fire extinguisher stickers are provided on driver and co-driver side door.



10. CNG COMPLIANCE PLATE

Compliance plate is fitted on fuel lid with CNG kit identification and installation details.



Compliance Plate

CNG cylinder needs to be recertified every three years (or as per the latest government notification) as per CMVR. Please ensure that it is done by TATA.CARS Authorised Service centre and the new date is engraved on the plate.

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11. TYRE PRESSURE

Recommended Tyre Pressures

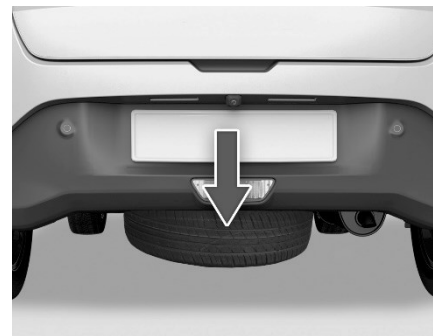
Tyre size	Front (psi/bar)	Rear (psi/bar)	Spare
175/65 R14	33 / 2.28	36 / 2.48	36 / 2.48
T155/80 R13	NA	NA	36 / 2.48

NOTE

- *Maintain tyre inflation pressure as per the specific mentioned in tyre pressure sticker.*
- *Regular tyre and spare tyre to be checked for correct tyre inflation pressure at least once a month.*
- Tyre to be loaded within the max allowable load limit specified by the load rating index marked on the tyre.
- Tyre to be operated within the speed limit specified in the speed rating index marked on the tyre.
- Recommended tyre pressure is 60 psi (4.2 bar) for temporary spare wheel

12. SPARE WHEEL REMOVAL AND FITMENT

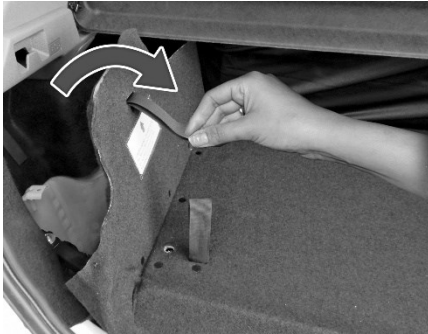
Spare Wheel Location on Vehicle



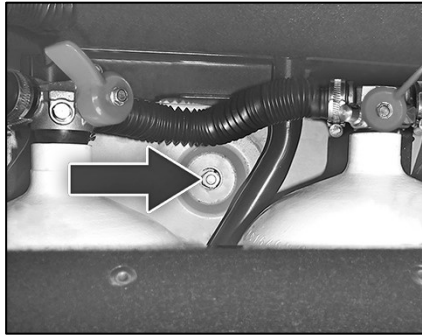
For Tiago - Spare wheel Removal Process

To remove the spare wheel, open tail gate.

- Fold the left carpet flap.



- Once carpet flap is removed spare wheel winch nut can be accessed.



- Insert the jack handle available in tool kit bag & rotate anticlockwise to unscrew the retaining bolt.



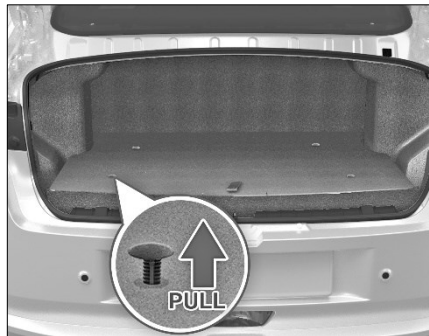
- As the retaining bolt gets loosened, the spare wheel lowers down.
- Remove holding bracket from spare wheel and get the spare wheel separated.

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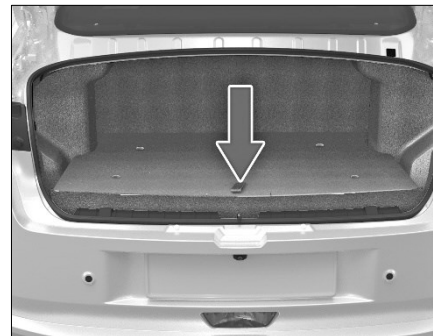


For Aeris - Spare wheel Removal Process

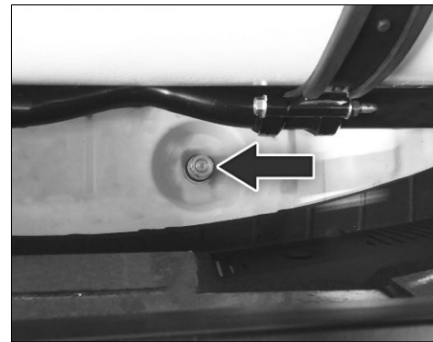
- Remove plastic clips (4nos) from load floor carpet.



- Fold the left carpet flap & lift the load floor using straps.



- Once the load floor is removed, spare wheel winch nut can be accessed.



- Insert the spare wheel removal tool & rotate anticlockwise using jack handle to unscrew the retaining bolt.



- As the retaining bolt gets loosened, the spare wheel lowers down.



- Remove holding bracket from spare-wheel & get the spare wheel separated.



NOTE

- Specially designed temporary spare wheel is available in your vehicle.
- Never drive faster than 80 km/h (50mph). While using Temporary spare wheel reduce speed, Avoid sharp cornering, Avoid sudden acceleration, abrupt steering, sudden braking and shifting operations that cause sudden engine braking.
- The ground clearance of your vehicle may be reduced with temporary wheel, take while driving on uneven road and parking next to curb.
- Snow chains cannot be used on the temporary spare wheel. Hence the temporary spare should not be installed on the front axle if the vehicle must be driven in snow or on ice.
- Never use temporary spare wheel if it is damaged.
- TPMS is not provided in temporary spare wheel.

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- *Recommended to drive 50km in a stretch and reach nearest TATA.CARS Authorised Service Centre.*

Spare wheel fitment process

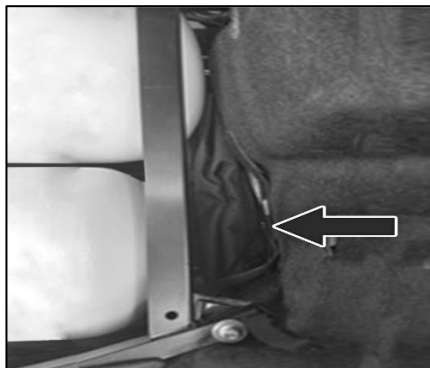
- Engage the holding bracket in spare wheel.
- Insert the spare wheel removal tool and rotate clockwise to lift the spare wheel.

NOTE

- *Always use only the recommended size of wheel rims & tyres. Use of non-recommended rims and tyres may have an adverse effect on car safety.*
- *The tread depth of spare wheel is lesser compared to regular wheel, hence do not use the spare wheel for longer distance than recommended.*
- *Once the spare wheel is repaired and is ready to be refitted, keep the direction of the air filling nozzle outwards for easy air filling.*

13. TOOL KIT

- Lift the load floor to access the tool kit.
- Tool kit is available near CNG cylinders on right hand side.



On right side of CNG cylinders

14. TECHNICAL SPECIFICATIONS

Parameter	Petrol
Engine (Bi-Fuel :Petrol +CNG)	
Model	1.2L REVOTRON
Type	Bifuel CNG , 4 Stroke MPFI, inline 3 cylinder with 4 valves per cylinder
No. of cylinders	3
Bore X Stroke	77 mm x 85.8 mm
Capacity	1199 cc
Max. Engine output CNG Mode	55.58 kW @ 6000 RPM
Max. Torque CNG Mode	96.5 Nm @ 3500+ /-200 RPM
Compression ratio	(11.3 +/- 0.3) :1
Firing order	1-2-3
Oil capacity	4L
Emission compliance	Bharat Stage VI Phase II
Cooling system capacity	4L (Water + Coolant)
Gross Vehicle weight	Tiago : 1498 Aeris : 1552
Ground clearance	Tiago : 146 Aeris : 141 (Laden)
Fuel Capacity	
CNG	Tiago : 60 Liter (35L+25L) of Water Capacity Aeris : 70 Liter (35L+35L) of Water Capacity

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Wheels & Tyre (CNG)	
Tyres	Option I : 175/65 R14 82T/8H (Radial / Tubeless) Option II : T155/80 R13 79T (Radial / Tubeless) for spare tyre only
Wheel rims	Option I : 5J x 14" Option II : 4.5J x 13" for spare tyre only

15. PRELIMINARY TROUBLE SHOOTING

These tips are given for your guidance. These preliminary checks can be carried out in case of emergency. In normal cases the problems should be attended by TATA.CARS Authorised Service Centre.

SN	PROBLEM OBSERVED	PROBLEM CAUSE	ACTION TO BE TAKEN
1	Engine does not start	Fuel Lid Open	Close Fuel Lid
2	Engine cranks but does not start - CNG Mode	No CNG	Refill CNG
		Fuel Lid Open	Close Fuel Lid
		CNG filter / fuel lines choked	Get CNG filter replaced at TATA.CARS authorised service centre
		CNG Regulator solenoid not operating	Contact TATA.CARS authorised service centre
		Error logged in ECU	Contact TATA.CARS authorised service centre
3	MIL / SIL are ON / blinking continuous, even after start.	Fault(s) are detected by ECU	Get the vehicle checked and rectified at TATA.CARS authorised Service Centre.
4	Vehicle doesn't change over to CNG mode when change over switch is pressed	Manual shut off valve on cylinder closed	Open Manual Shut off Valve
		Check CNG Level on instrument cluster.	Refill CNG if level shows empty.
		Both conditions are ok, and the car is still not changing over to CNG	Have your vehicle checked by TATA.CARS authorised Service Centre.

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16. SERVICE SCHEDULE

	Periodic Maintenance Schedule		Free Service			Periodic Maintenance														
SN	Service Intervals in km (Kilometer) or months whichever comes earlier	Km	1000	5000	10000	20000	30000	40000	50000	60000	70000	80000	90000	100000	110000	120000	130000	140000	150000	
		Months	2	6	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	
I: Inspect (Check, Clean, Correct, Top up, Adjust, Repair, Replace as necessary) T: Tightening Torque R: Replace																				
1	Check Mountings of filler valve, Sensor, Regulator assembly, Cylinder Cradle. Check All Joints- High-pressure, Low-Pressure circuit (Gas Leakage)	-	-	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
2	Pressure regulator, Solenoid Valve operation and Vacuum port for any blockages	-	-	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
3	Drain the oil from the CNG filter body and then replace the CNG filter cartridge and all O rings from CNG Low Pressure Filter					R			R			R			R			R		
4	Receptacle Valve O-Ring	Replace Every 1,50,000 km /24 Months whichever comes earlier																		
5	Recertification of Tank / Cylinder. (As per present Government norms)	Every 3 Years from date of initial testing by govt. approved testing agency																		

Note: This Service schedule is in addition to existing main Schedule of respective vehicle.

Frequency is marked in kms

#To be done earlier as per months if kms covered is less.