



MADHUS
Garage Equipment

MADHUS GREEN CLEAN

Diesel Particulate Filter Cleaning Equipment

About Madhus

***Vision** – To provide the support and services for vehicular and non-vehicular emission systems by developing and producing best of class consumables and cleaning equipment, it's peripheral parts to facilitate the sustenance of economic maintenance of the BSVI emission aggregates.*

Madhus who have introduced many new technology and products to Indian market brings Green Clean DPF cleaning equipment. Manufactured to endure the local conditions.

For over 35 years, Madhus has consistently brought the most advanced equipment that revolutionises the performance of new generation automobiles in India. Madhus offers the world's best equipment in wheel aligners, wheel balancers, car lifts, welding equipment, collision repair systems, A/C maintenance equipment, smoke meters, gas analysers, etc., from the world's leading brands like Hunter, Ravaglioli, Texa, Telwin, Hanmecson and many more. That's not all, Madhus provides quality after-sales service by employing well trained and knowledgeable technicians. Madhus also provides training to technicians at state-of-the-art training centres in Delhi NCR, Bangalore and Pune.

Committed to bring to India international quality equipment with assured technical and service support, Madhus is committed to deliver the best quality products for new generation automobiles and future-ready technologies.



GREEN CLEAN

Why Should You Invest in “Madhus Green Clean”?

- The best investment to maximize returns before the market becomes saturated.
- The demand is just picking up and if you establish your clientele, you can earn maximum.
- You can trust the product coming from Madhus
- You can depend on reliable service.
- Madhus is working with all OEMs to get their official approval.
- This ensures a good inflow of DPF for cleaning.
- It can be done by any unskilled labour. It is user-friendly.
- OEMs are looking for investors who can provide this service all over India.
- The demand for cleaning has already started, and it will only increase with the new Bharath VI emission norms being strictly enforced.
- The equipment will give a report that shows a cleaning job has been done successfully by looking at the printout of back pressure - before and after.



WHY CLEAN DIESEL PARTICULATE FILTER (DPF)

The BS VI emission norms for the Diesel engine powered vehicle, the maximum permissible particulate matter in the diesel exhaust is 0.005 gm/kW-hr which is about 80% less than BS- IV norms. Besides particulate mass; there is also a regulation for particle number where only certain count of particles are allowed from the diesel exhaust. To meet these stringent emission norms an additional aggregate called Diesel Particulate Filter is needed on the vehicle.



- DPF's are used to trap and filter harmful particulate emissions from diesel exhaust which are classified as carcinogens, from diesel engines. DPF can filter more than 95% of these emissions.
- DPF are made of ceramic material and have a honeycomb kind of structure with lot of parallel channels running along the length of the DPF. Alternate channels are plugged at the inlet and outlet ends respectively.
- As the exhaust gases enter the inlet channels they cannot exit the inlet channels as they are plugged at the outlet end and the gases have to flow through the porous wall and out of the outlet channels. In passing through the walls of the channels the soot particles get filtered and deposited in the inlet channels. This leads to back pressure on the engine and adversely affects its fuel economy. So the filtered particulates have to be burnt or oxidized intermittently.
- The organic constituents of the particulate emissions can be oxidized by raising the exhaust temperature above 600 degC and will be removed from the DPF. This process is called as active regeneration of the soot. The active regeneration of soot is done intermittently depending on several different parameters.
- The inorganic constituents cannot be oxidized and remain trapped in the DPF as ash. Over several thousands of kilometers of running of the vehicle, this can lead to significant amounts of ash in the DPF which again increases backpressure on the engine and adversely affects the fuel economy and also reduces the effective volume available for PM filtering thereby reducing the effectiveness of the device. So the ash trapped in the DPF has to be physically removed/cleaned and disposed in an environmentally friendly manner.

DIFFERENT DPF CLEANING METHODOLOGY PRACTICED

SR NO	CLEANING METHOD	TIME FOR CLEANING	ADVANTAGES AND DISADVANTAGES
1	Heat treatment + Pneumatic cleaning	Heat treatment: 6-12 hrs and cleaning: 1-2 hrs	<ul style="list-style-type: none"> • Cleaning efficiency around 70% • Takes very long time • Oven baking can damage the DPF substrate due to thermal shocks and can damage the catalytic coating due to high temperature if not controlled properly • Work environment with pneumatic cleaning can be hazardous to the operator as he can be exposed to ash particulates
2	Ultrasonic cleaning	Ultrasonic cleaning: 6-12 hrs and drying: 1 hour	<ul style="list-style-type: none"> • Cleaning efficiency is low • Takes long time for cleaning • Can damage the washcoat or coating if kept immersed in cleaning liquid for long time due to vibrations generated by ultrasonics
3	Chemical additives	-	<ul style="list-style-type: none"> • Chemical additives can damage the coating or substrate itself • Some additives can lead to some secondary emissions or can generate more ash which can block the DPF
4	*Madhus Green Clean Solvent + High pressure water and air cleaning + Drying	1-2 hours	<ul style="list-style-type: none"> • Very quick and effective • High ash removal efficiency ~ 90% • No damage to the filter or coating • Can be used for cleaning Passenger cars, LCV's and heavy duty DPF's

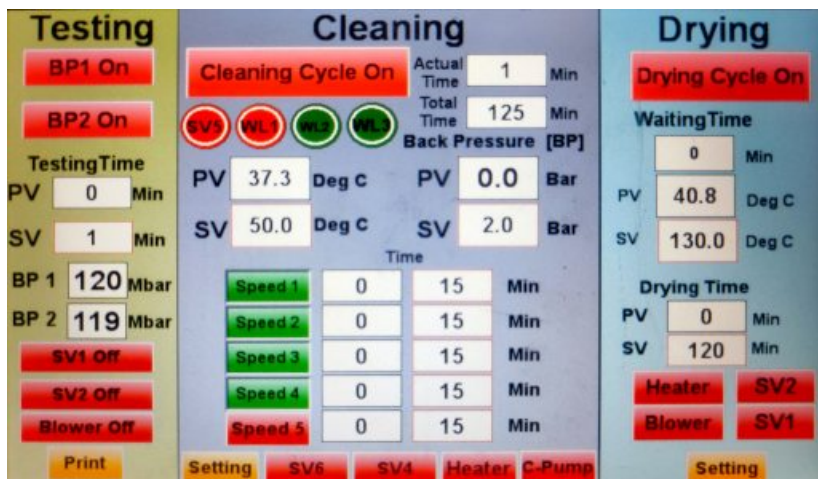
* Supplied by Madhus Garage Equipment.

MADHUS GREEN CLEAN

The Madhus Green Clean is a “Made in India”. In addition to the machine being indigenised, additional features have been incorporated in the machine for our Indian conditions.

The salient features of the machine are as follows:

- Can be used for both passenger car as well as commercial vehicle DPF cleaning
- Cleaning is done using mixture of solvent with pressurized RO water and air
- Completely Automated process
- Entire operations like cleaning and drying is done on the same machine, eliminating the need of a separate oven
- The total cycle time ranges from 90-120 mins depending on the size of the DPF
- The 5 micron filter bag is reusable, to be washed after cleaning 15 to 20 DPFs, depending on the size of the DPFs and the amount of soot and ash load
- The water should be changed after 15-20 DPF Cleans
- Minimal water & solvent wastage
- The unique feature is that the air and liquid flow pressures are controlled through a variable frequency drive pressure pump, which ensures no damage to the DPF
- All hardware parts of the machine, including the software and logic, are developed indigenously. This ensures the availability of spares and consumables off the rack
- Print out of the initial and final backpressure can be taken
- Automatic alarm for clogged filter
- Automatic alarm if door opens
- The cleaning efficiency of the machine is very high, after cleaning the DPF will work like new



- Colour display with touch screen
- Single screen operation with all functions

DPF CLEANING PROCESS

1

- Mount the DPF in the cleaning machine compartment using suitable adaptor with hose.

2

- Select the cleaning parameters through the software on the touch screen display. Add the required amount of solvent into the DPF chamber after backpressure measurement.

3

- A turbo blower circuit automatically dries the filter after cleaning.

4

- After drying, it automatically measures the final back pressure and prints the before and after final back pressure values.

Tower light indicator to know the process and warnings.

Touch screen user interface gives user friendly operation.

Pneumatically operated cylinder locking system for truck DPF.



MADHUS GREEN CLEAN SPECIFICATIONS

Machine External Dimensions	Height- 2190 mm Width- 1610 mm Depth- 1170 mm
Machine Power Connection	3 Phase, 32 amps
Complete Machine Material	Stainless Steel 304 grade
Water Tank	300 Ltr.
Water Heater	Power- 12 kW
Filtration System	Dual stage water cleaning system with 5 micron filter
Water Pump	Power- 3.7 kW
Dryer Air Blower	Power- 1.1 kW
Dryer Heater	Power- 4.5 kW
Compressed Air Requirement	Max pressure- 4-6 bars (to be free of dust and oil)
Water Requirement	RO quality water
Cycle Time	Cleaning Time- Max 60 minutes, Drying time- Max 30 minutes
Water Top Up	Will be done automatically
Filter Change	Alarm gets actuated automatically

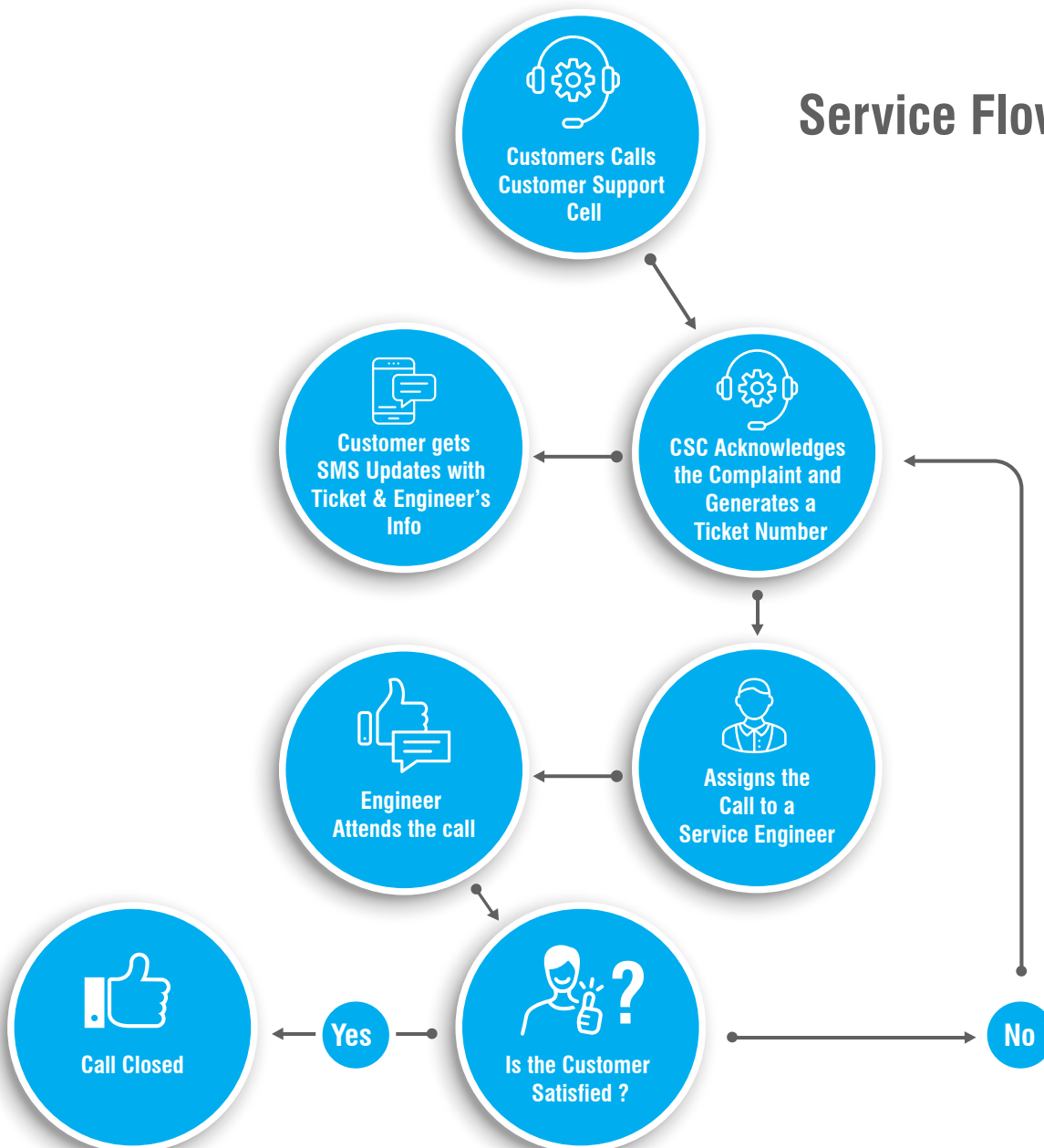
A Promise to our Customers

Our experts are trained as customer care executives to provide quick, reliable, and ideal solutions.

- Your complaints are instantly registered in our customized software.
- We aim to attend all complaints within 24 hours and close it within 72 hours of being registered.
- All updates on the complaint are communicated via SMS
- All detailed records of each complaint are maintained and stored for any unforeseen circumstance.

In addition to this, our team comprises of more than 110 Service engineers in the field placed in over 35 locations across India. We also maintain adequate spare parts required to repair and damaged machines.

Service Flow Chart



Our Sales Team

Our team is a group of dynamic and enthusiastic professionals who deliver skilled expertise rooted in experience and knowledge.



Our Service Team

Our team is a collective of refined skills, honed by rigorous training. They are driven by dedication for reliable and consistent quality service.



Sales & Service Locations

150+ Engineers in over 35 Locations

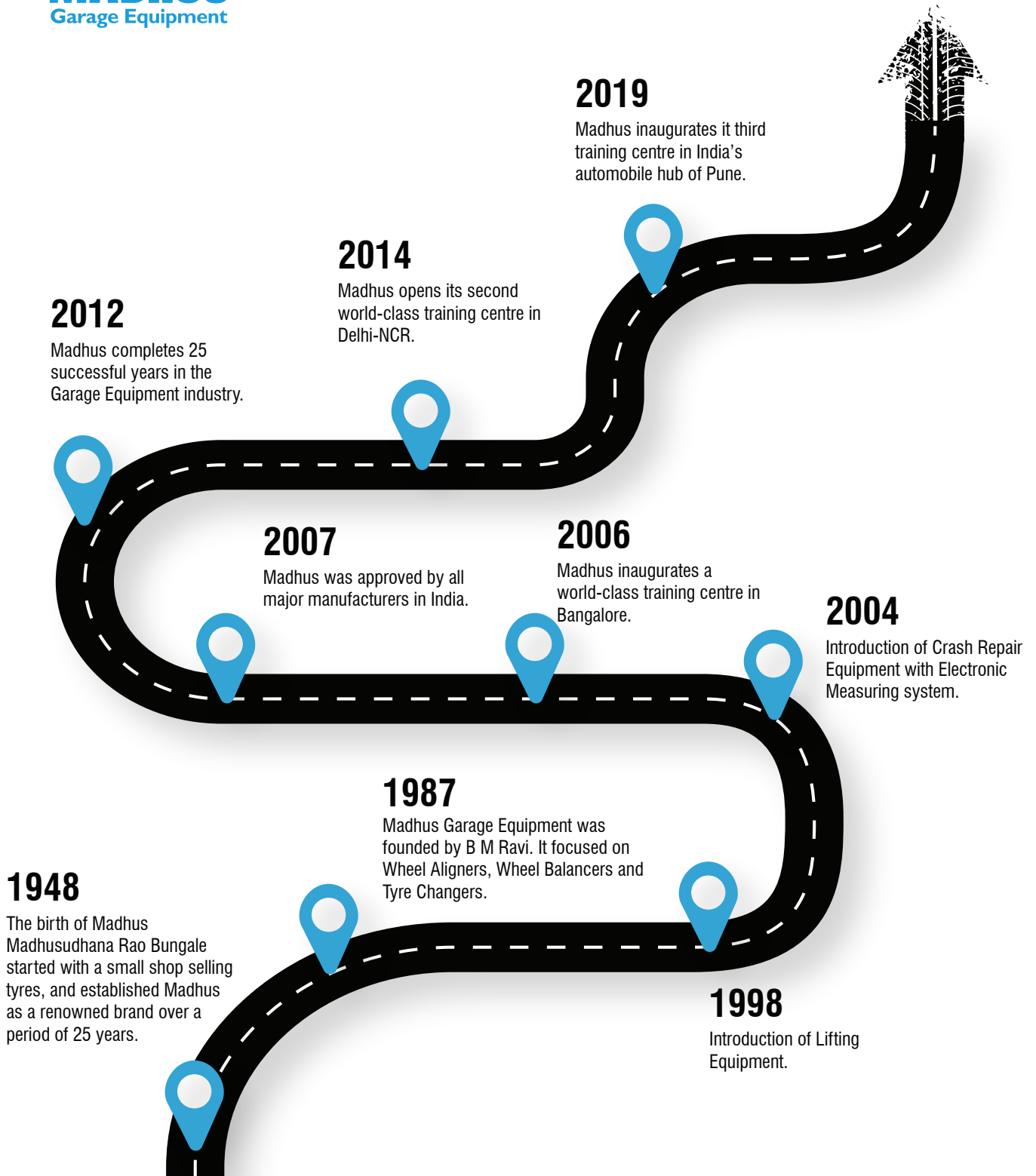


Our Training Centres

- Bangalore
- Delhi
- Pune



35 Years and the journey continues...
Madhus, with its team of over 250 professionals across 35 cities, continues to serve customers and bridge the technological gap between India and the First World.



Thank you for helping us reach this milestone.

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