AUTOCARE CONNECT

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1. TABLE DESIGN

- TABLE: ADMIN

Field Name	Data Type	Constraints	Description
admin_id	INT	PRIMARY KEY, AUTO INCREMENT	Unique admin identifier
name	VARCHAR(100)	NOT NULL	Admin full name
email	VARCHAR(100)	UNIQUE, NOT NULL	Admin email address
phone	VARCHAR(15)	UNIQUE, NOT NULL	Admin contact number
username	VARCHAR(50)	UNIQUE, NOT NULL	Login username
password	VARCHAR(255)	NOT NULL	Encrypted password
role	VARCHAR(30)	CHECK (Admin, Staff)	Admin role

- TABLE: CUSTOMER

Field Name	Data Type	Constraints	Description
customer_id	INT	PRIMARY KEY, AUTO INCREMENT	Customer unique ID
name	VARCHAR(100)	NOT NULL	Customer name
email	VARCHAR(100)	UNIQUE	Customer email
phone	VARCHAR(15)	UNIQUE, NOT NULL	Customer phone number
address	TEXT	NOT NULL	Customer address
password	VARCHAR(255)	NOT NULL	Customer login password

- TABLE: MECHANIC

Field Name	Data Type	Constraints	Description
mechanic_id	INT	PRIMARY KEY, AUTO INCREMENT	Mechanic unique ID
name	VARCHAR(100)	NOT NULL	Mechanic name
email	VARCHAR(100)	UNIQUE	Mechanic email address
phone	VARCHAR(15)	UNIQUE, NOT NULL	Mechanic contact number
specialization	VARCHAR(100)	NOT NULL	Area of expertise
password	VARCHAR(255)	NOT NULL	Login password
status	VARCHAR(20)	CHECK (Active, Inactive)	Mechanic availability

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- TABLE: VEHICLE

Field Name	Data Type	Constraints	Description
vehicle_id	INT	PRIMARY KEY, AUTO INCREMENT	Vehicle unique ID
customer_id	INT	FOREIGN KEY	Owner customer reference
vehicle_number	VARCHAR(20)	UNIQUE, NOT NULL	Vehicle registration number
model	VARCHAR(50)	NOT NULL	Vehicle model
fuel_type	VARCHAR(20)	CHECK (Petrol, Diesel, Electric)	Fuel type

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- TABLE: SERVICE_BOOKING

Field Name	Data Type	Constraints	Description
booking_id	INT	PRIMARY KEY, AUTO INCREMENT	Service booking ID
customer_id	INT	FOREIGN KEY	Customer reference
vehicle_id	INT	FOREIGN KEY	Vehicle reference
service_type	VARCHAR(100)	NOT NULL	Type of service requested
booking_date	DATE	NOT NULL	Booking date
pickup_required	VARCHAR(10)	CHECK (Yes, No)	Pickup required or not
status	VARCHAR(30)	CHECK (Pending, In Progress, Completed)	Service status

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- TABLE: DRIVER

Field Name	Data Type	Constraints	Description
driver_id	INT	PRIMARY KEY, AUTO INCREMENT	Driver unique ID
name	VARCHAR(100)	NOT NULL	Driver name
phone	VARCHAR(15)	UNIQUE, NOT NULL	Driver contact number
email	VARCHAR(100)	UNIQUE	Driver email
password	VARCHAR(255)	NOT NULL	Driver login password
status	VARCHAR(20)	CHECK (Available, Busy, Inactive)	Driver availability

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- TABLE: PICKUP_DELIVERY

Field Name	Data Type	Constraints	Description
pd_id	INT	PRIMARY KEY, AUTO INCREMENT	Pickup/Delivery ID
booking_id	INT	FOREIGN KEY	Booking reference
driver_id	INT	FOREIGN KEY	Driver reference
pickup_location	TEXT	NOT NULL	Pickup address
pickup_status	VARCHAR(30)	CHECK (Pending, Picked)	Pickup status
delivery_status	VARCHAR(30)	CHECK (Pending, Delivered)	Delivery status

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- TABLE: INVOICE

Field Name	Data Type	Constraints	Description
invoice_id	INT	PRIMARY KEY, AUTO INCREMENT	Invoice ID
booking_id	INT	FOREIGN KEY	Booking reference
total_amount	DECIMAL(10,2)	NOT NULL	Total bill amount
payment_status	VARCHAR(20)	CHECK (Paid, Unpaid)	Payment status
invoice_date	DATE	NOT NULL	Invoice date

2. TABLE NORMALISATION

Database normalization is the process of organizing data to minimize redundancy and improve data integrity. The tables designed for the AutoCare Connect – Car Workshop Management System have been normalized up to Third Normal Form (3NF) to ensure efficient storage, consistency, and scalability.

First Normal Form (1NF)

All tables in the AutoCare Connect system satisfy First Normal Form (1NF) because:

- Each attribute contains only atomic (indivisible) values
- There are no repeating groups or multi-valued attributes
- Every record in each table is uniquely identified by a primary key

Second Normal Form (2NF)

All tables satisfy Second Normal Form (2NF) because:

- The tables are already in First Normal Form (1NF)
- There is no partial dependency
- All non-key attributes depend entirely on the full primary key

Third Normal Form (3NF)

All tables satisfy Third Normal Form (3NF) because:

- The tables are already in Second Normal Form (2NF)
- There is no transitive dependency
- All non-key attributes depend only on the primary key and not on other non-key attributes

Final Table Design (3NF)

All tables designed for the AutoCare Connect – Car Workshop Management System follow Third Normal Form (3NF) and ensure:

- Reduced data redundancy
- Improved data integrity and consistency
- Efficient data storage and retrieval
- Better maintenance and scalability of the database

The normalized database structure supports the smooth functioning of all system modules, including Admin, Customer, Mechanic, Driver, Service Booking, Pickup & Delivery, and Billing.