**TurboTorque Testing:**

**Black-Box Testing:**

**Equivalence Class Partitioning:**

| **Field** | **Equivalence Classes (EC)** | **Test Case ID** |  |
| --- | --- | --- | --- |
| Full Name | EC1: Valid name (letters + spaces) | TC1 |  |
|  | EC2: Contains digits or symbols (invalid) | TC2 |  |
|  |  |  |  |
| Email | EC3: Correct format (user@domain.com) | TC3 |  |
|  | EC4: Missing @ or domain part | TC4 |  |
|  |  |  |  |
| Phone Number | EC5: Valid 10‑12 digits | TC5 |  |
|  | EC6: Includes letters or < 10 digits | TC6 |  |
|  |  |  |  |
| Password | EC7: Meets complexity (≥8 chars, letters + numbers) | TC7 |  |
|  | EC8: Too short (<8 chars) | TC8 |  |
|  |  |  |  |
| Re-enter Password | EC9: Matches Password | TC9 |  |
|  | EC10: Does not match | TC10 |  |
|  |  |  |  |
| Car Year | EC11: Within valid range (1886–2025) | TC11 |  |
|  | EC12: Below 1886 or above 2025 | TC12 |  |
|  |  |  |  |
| Price | EC13: Positive number | TC13 |  |
|  | EC14: Zero or negative | TC14 |  |
|  |  |  |  |
| Brand Name | EC15: Non-empty string | TC15 |  |
|  | EC16: Empty string | TC16 |  |
|  |  |  |  |

**Boundary Value Analysis**

| **Field** | **Boundary Values** | **Test Inputs** | **Test Case ID** |
| --- | --- | --- | --- |
| Phone length | 10 (min), 12 (max), 9, 13 | 10, 12, 9, 13, 11 | BVA1–BVA4 |
| Password length | 8 (min), 20 (max), 7, 21 | 8, 20, 7, 21, 13 | BVA5–BVA8 |
| Car Year | 1886 (min), 2025 (max), 1885, 2026 | 1886, 2025, 1885, 2026, 1950 | BVA9–BVA12 |
| Price | 1 (min valid), 0, -1 | 1, 0, -1, 50000 | BVA13–BVA15 |

**Validation Against User Stories**

Map each test case to functional requirements/user stories:

| **Test Case** | **Feature** | **User Story** |
| --- | --- | --- |
| TC1–TC10 | User Registration Form | As a user, I want to create an account using my email or phone number so that  I can access all features. |
| TC11–TC14 | Car Addition/Delete | As a seller, I want to list my vehicle by providing details like make, model,  price, and condition so that I can find a buyer. |
| TC15–TC16 | Brand Management | As admin, I can manage (add/delete) brands. |
| BVA# | Edge behavior | Shift from basic to boundary validation. |

### Detailed Test Cases

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ID** | **Description** | **Precondition** | **Test Steps** | **Expected Result** |
| TC1 | Register with valid full name and email | User on registration page | 1. Enter "Muhammad Taha" in Full Name  2. Enter [muhammadtaha@gmail.com](mailto:muhammadtaha@gmail.com)  3. Fill other valid fields  4. Click Continue | Account is created  Redirect to dashboard  Success message shown |
| TC2 | Register with invalid characters in full name | User on registration page | 1. Enter "Name123" in Full Name  2. Fill other valid fields  3. Click Continue | Error under Full Name: "Only letters and spaces allowed" |
| TC4 | Register with malformed email | User on registration page | 1. Enter valid name  2. Enter "email.com" in Email  3. Complete other valid fields  4. Click Continue | Error under Email: "Invalid email format" |
| TC5 | Register with short phone number | User on registration page | 1. Enter valid name and email  2. Enter "123456789" in Phone Number  3. Complete other valid fields  4. Click Continue | Error under Phone: "Phone must be 10–12 digits" |
| TC7 | Register with weak password (<8 chars) | User on registration page | 1. Enter valid name, email, phone  2. Enter "Pass1" in Password  3. Re-enter "Pass1"  4. Click Continue | Error under Password: "Password must be at least 8 characters" |
| TC9 | Register with non-matching re-entered password | User on registration page | 1. Enter valid name, email, phone  2. Enter "Password123" in Password  3. Enter "Password321" in Re-enter  4. Click Continue | Error under Re-enter Password: "Passwords do not match" |
| TC11 | Add car with valid year and price | Logged in as seller | 1. Navigate to Add Car  2. Enter valid name  3. Enter 2020 for Year and 15000 for Price  4. Submit | Car appears in listings; success message shown |
| TC12 | Add car with out-of-range year | Logged in as seller | 1. Navigate to Add Car  2. Enter valid name  3. Enter 1880 for Year  4. Submit | Error under Year: "Year must be between 1886 and current year" |
| TC13 | Add car with negative price | Logged in as seller | 1. Navigate to Add Car  2. Enter valid details, Price = -50003. Submit | Error under Price: "Price must be positive" |
| TC15 | Add brand with empty name | Logged in as admin | 1. Navigate to Brand Management  2. Leave Name blank  3. Click Add Brand | Error under Brand Name: "Name is required" |

**White-Box Testing**



