



Shyam Gupta

Value World, Bharat

Getting Big Things
Done Through

VALUE
MANAGEMENT
DE LA VALEUR

Réaliser de grandes
choses avec le

A Case Study
FRONT FENDER



dyA Case Study

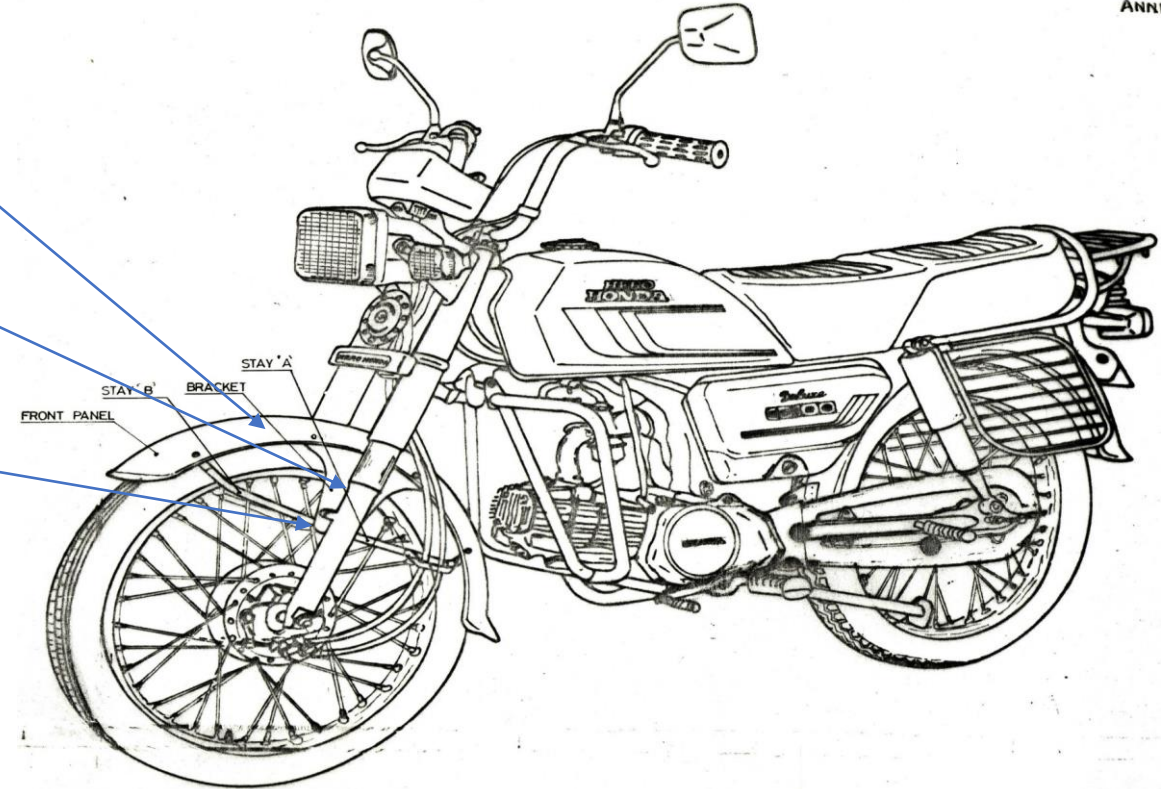
FRONT FENDER



Front Fender

Bracket

Stay A & B



Presented by
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Gurgaon, Bharat



Agenda



- **Customer complaint investigation**
- **Value Engineering approach**
- **Achieve cost saving too**
- **Enhance value for customer**
- **Promote Teamwork.**



Benefits from V.E. Project

Saving Financials

(Rs/CAD)

Per Bike	49.74/0.8
Recurring/ Yr	62 M/1 M
% Saving	27.6



- Rusting Problem
- Customer Complaints
- Customer Value
- Fender Performance
- Material Utilization
- Team Morale



Information Phase-Team



Team meets weekly

The team consisted of the following members: -

- 1. Team Leader**
- 2. Product Design**
- 3. Prototype Making & approval**
- 4. Product Engineering**
- 5. Material Purchasing**
- 6. Marketing**
- 7. Service**
- 8. Finance and Costing**



V.E. Process

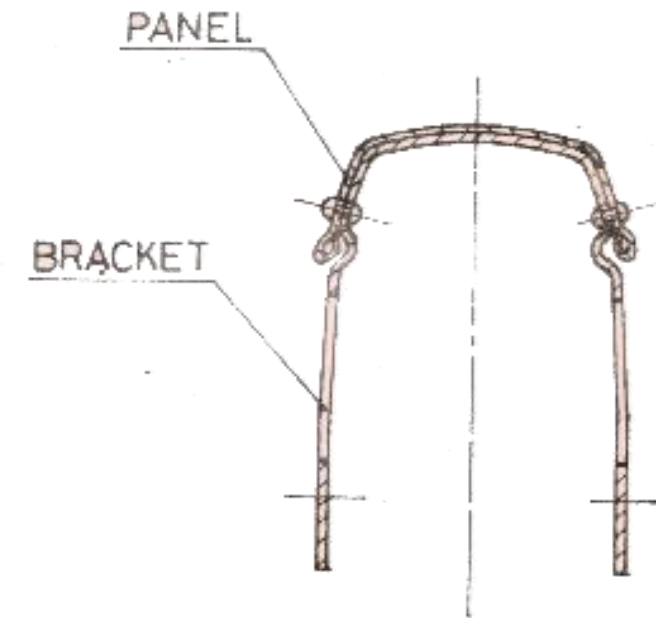
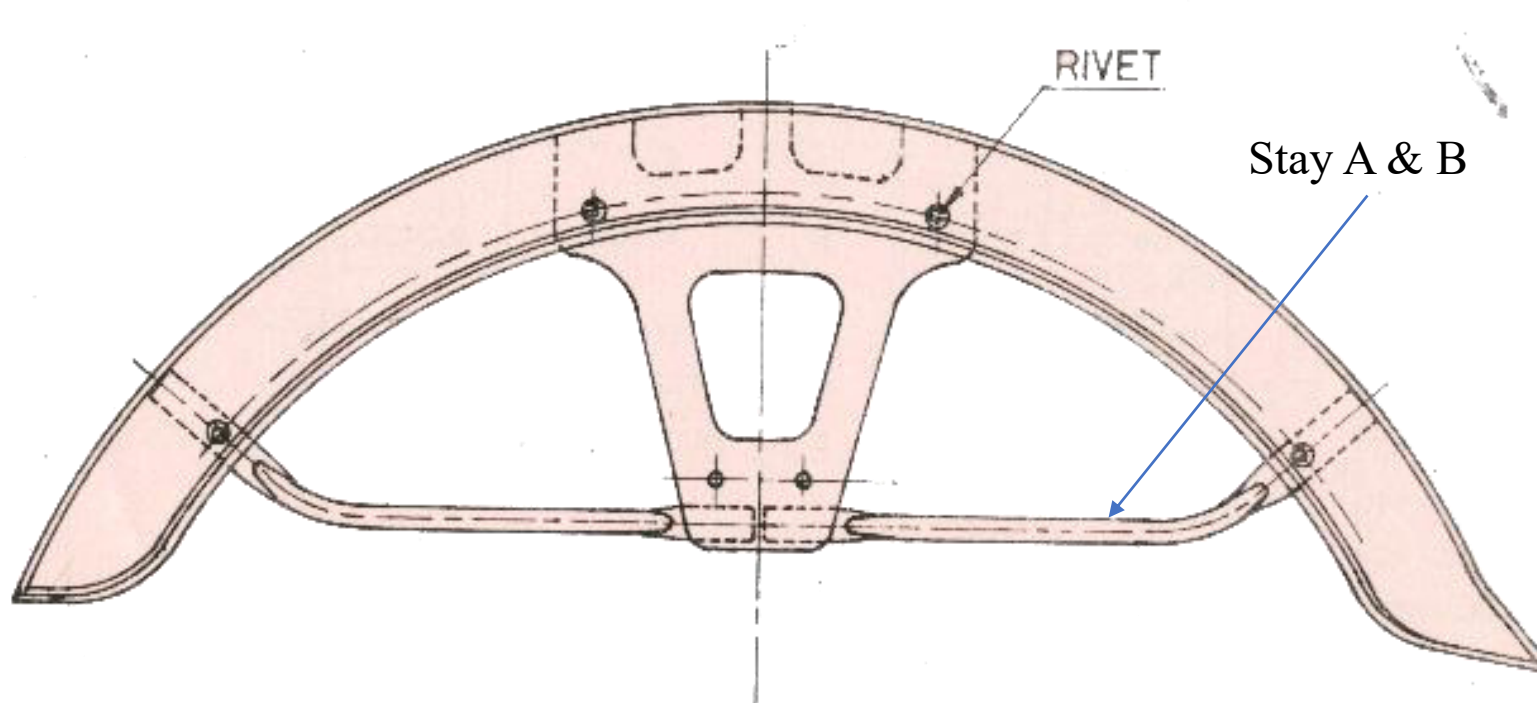


A systematic step by step team process

- 1. Information Phase**
- 2. Function Phase**
- 3. Creative phase**
- 4. Analytical Phase**
- 5. Evaluation Phase**
- 6. Recommendation Phase**
- 7. Implementation Phase**



Information Phase-Front Fender



Information Phase-Raw Material Utilization Analysis



Item	Blank Size (mm)	Blank Weight (KG)	Finished Weight (KG)	Utilization (%)
Panel	860x275	1.485	0.763	51.4
Bracket	402x180	1.82	0.904	49.7



Information Phase-Cost Analysis



Description	Cost (Rs./CAD Per bike)
Raw Material	32.52/0.54
Labor, overheads etc	36.41/0.6
Plating	22.42/0.37
Bracket	86.4/1.44
Rivets-8 N	2.24/0.04
Front Fender Complete	180.29/3



Function Phase (Identifying the Functions)



Key Questions

What is it?

What does it do?

What must it do?



S. N.	Function		Basic/ Secondary
	Verb	Noun	
1.	Stop	Matter	Basic
2.	Locate	Parts	Secondary
3.	Increase	Strength	Secondary
4.	Increase	Durability	Secondary
5.	Prevent	Corrosion	Secondary
6.	Enhance	Aesthetics	Secondary
7.	Minimize	Vibration	Secondary



Function-Cost-Worth



Key Questions

How much does it cost?

How much should it cost and no more?

S. N .	Function		Basic / Sec.	Cost (Rs/CAD)	Worth (Rs/CAD)	Cost: Worth
	Verb	Noun				
1.	Stop	Matter	Basic	12.66/0.2	2.00/.03	6.33
2.	Locate	Parts	Sec	43.29/0.72	7.40/0.12	5.85
3.	Increase	Strength	Sec	8.86	3.68/0.6	2.4
4.	Increase	Durability	Sec	66.79	14.57/0.24	4.58
5.	Prevent	Corrosion	Sec	21.06	1.22/0.2	17.26
6.	Enhance	Aesthetics	Sec	19.93	6.5/0.11	3.07
7.	Minimize	Vibration	Sec	7.70	2.50/0.42	3.08



Creative Phase- Alternate Ideas



Key Question

What else will do the job same way or better?



Function	Ideas	Analysis	Remark
Stop Matter	Erect a Wall	Bike is a moving object	
	Cordon off the area	Wild idea	
	Cover with a plastic	Feasible	Selected
	Cover with a plywood	Not durable	
	Apply Force	Not feasible	
	Apply Suction	Wild idea	
	Use less thick Sheet	Saving of RM	Selected



Creative Phase (Continued)



Key Question

What else will do the job same way or better?

Function	Ideas	Analysis	Remark
Increase Durability	Use thicker sheet	0.8 mm thick sheet is ok	
	Use Aluminium Sheet	It is lighter with good producibility	Selected
	Use Plastic Fender	It is lighter with good producibility	selected



Creative Phase (Continued)



Key Question

What else will do the job same way or better?



Function	Ideas	Analysis	Remark
Prevent corrosion	Chrome plating	Presently used and is effective for aesthetics	
	Zinc plating with bright finish	Corrosion life is not adequate	
	Plastic fender	Easy to produce but needs to be painted. Acceptability by customer is poor	As per Marketing team
	Paint steel fender	Being used in another reference model but in India acceptability is poor	



Creative Phase (Continued)



Key Question

What else will do the job same way or better?

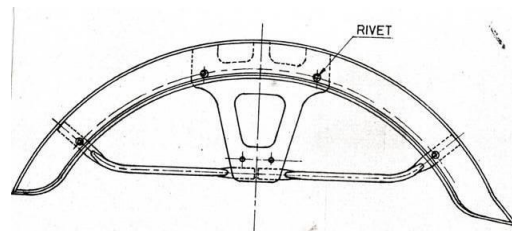
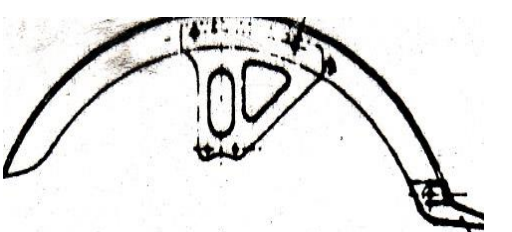
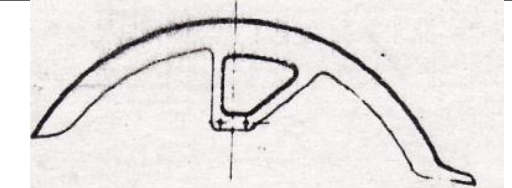


Function	Ideas	Analysis	Remark
Prevent corrosion	Use anodized aluminum sheet	Gets scratches easily and the colour fades	
	Anti rust chemical treatment on existing fender	Producibility is poor and right equipment not available	
	Use stainless steel sheet	Corrosion life is very good Aesthetics also good Cost may be higher	Selected for further study



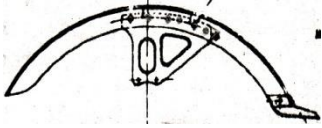
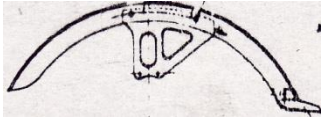
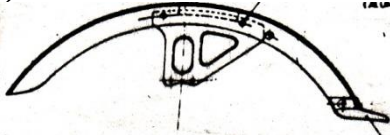
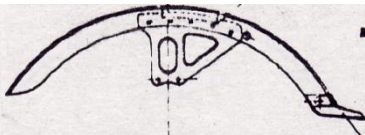
Analytical phase (Analysis of Alternate Ideas)



SN	Alt Idea	Cost (Rs/CAD)	Design Details
1	Existing Design	180/3	<p>a. Panel-.8 CRCS,EDD (Blank size 860X275)</p> <p>b. Bracket-3.2 mm CRCS, single piece</p> <p>c. Stay-CEW 1A Steel Tube-2 nos.</p> <p>d. Rivet-8 N Stainless steel</p> <p>e. Finish-Buffered & Ni-chrome plated</p> 
2	Modify profile less sheet thickness with ribs	130/2.16	<p>a. Panel-.8 CRCS,EDD (Blank size 860X240)</p> <p>b. Bracket-3.2 mm CRCS, single piece</p> <p>c. Stay-CEW 1A Steel Tube-2 nos.</p> <p>d. Rivet-8 nos Stainless steel</p> <p>e. Finish-Buffered & Ni-chrome plated</p> 
3	Plastic Fender	103/1.71	<p>ABS 2.5 thick, single piece-injection Moulded,</p> <p>Finish- Painted</p> 



Analytical phase (Analysis of Alternate Ideas)

SN	Alt Idea	Cost Rs/CAD	Design Details
4	Spot welding	129/2.15	<p>Panel-.8 CRCS,EDD (Blank size 855X240)</p> <p>Bracket-2.3 CRCS-DD sheet, 3 piece, welded</p> <p>Finish-Buffered & Ni-chrome plated</p> 
5	Fasten with bolts/screws	132/2.2	<p>Panel-.8 CRCS,EDD (Blank size 855X240)</p> <p>Bracket-2.3 CRCS-DD sheet, 3 piece, welded</p> <p>Screws- 4 nos. Pan Head screws M5X.8</p> <p>Finish-Panel Bufferd, Bracket buffed & Ni-cr plated</p> 
6	Stainless Steel Sheet	142/2.36	<p>Panel-.8 Stainless steel sheet (Blank size 855X240)</p> <p>Bracket-2.3 CRCS-DD sheet, 3 piece, welded</p> <p>Rivet-4 nos. stainless steel</p> <p>Finish-Buffered & Ni-chrome plated</p> 
7	Anodized Al sheet	155/2.58	<p>Panel-2mm Al. sheet (Blank size 855X240)</p> <p>Bracket-2.3 CRCS-DD sheet, 3 piece, welded</p> <p>Rivet-4 nos. Aluminum rivets</p> <p>Finish-Buffered & Ni-chrome plated</p> 

Analytical Phase- Criteria Weightage Matrix - Panel

G U I D E	Result of weight age	Points
	Major Preference	3
	Medium Preference	2
	Minor Preference	1

Criteria		B	C	D	E	F	Score
Strength	A	A1	A1	A2	A2	A1	7
Durability	B		B1	B3	B2	B3	10
Aesthetics	C		C	C3	C3	C3	11
Ease of implementation	D			D	D1	D1	2
Initial cost	E					E1	1
Ease of Production	F					F	1



Analytical Phase- Criteria Weightage Matrix- Bracket

G	Result of weight age	Points
U		
I	Major Preference	3
D		
E	Medium Preference	2
	Minor Preference	1

Criteria		B	C	D	E	F	Score
Strength	A	A=B	A=C	A3	A3	A3	11
Durability	B	B	B=c	B3	B2	B2	9
Aesthetics	C		C	C3	C3	C3	11
Ease of implementation	D			D	D=E	D=F	2
Initial cost	E				E	E=F	2
Producibility	F					F	2



Analytical Phase- Criteria Weightage Matrix– Stay A & B



G U I D E	Result of weight age		Criteria		B	C	D	E	F	Score
	Major Preference	3	Strength	A	A1	A2	A3	A2	A2	10
Medium Preference	2	Durability	B		B2	B3	B2	B2	9	
Minor Preference	1	Aesthetics	C			C2	C1	C2	5	
		Ease of implementation	D				D3	D2	5	
		Initial cost	E					E3	3	
		Producibility	F					F	1	



Evaluation Phase- Analysis Matrix



Grading	Rank
Excellent	4
Good	3
Fair	2
Poor	1

S N	Alternate Idea/ Average Criteria from matrix	Strength 9	Durability 10	Aesthetics 9	Initial Cost 3	Ease of Implementat ion 2	Producibility 1	Total
1	Existing	4 36	2 20	2 18	1 3	2 4	1 1	82
2	Modify Profile, Less thick sheet, use ribs	4 36	4 40	4 36	3 9	2 4	2 2	127
3	Plastic Fender	2 18	3 30	2 18	1 9	3 6	4 4	85
4	Spot welding	2 18	2 20	1 9	3 9	3 6	4 4	66
5	Fasten with bolts, screws	3 27	1 10	2 18	3 9	3 6	3 3	73
6	Use stainless steel sheet	4 36	4 40	2 18	1 3	2 4	3 3	104
7	Anodized Al Sheet	2 18	2 20	1 9	3 9	3 6	3 3	75



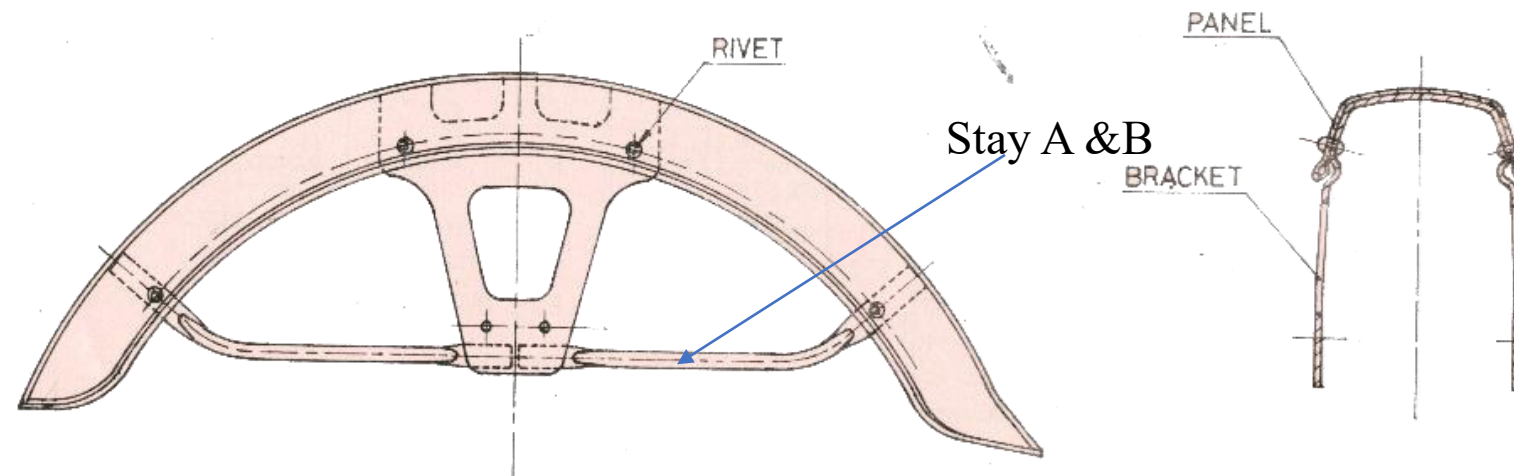
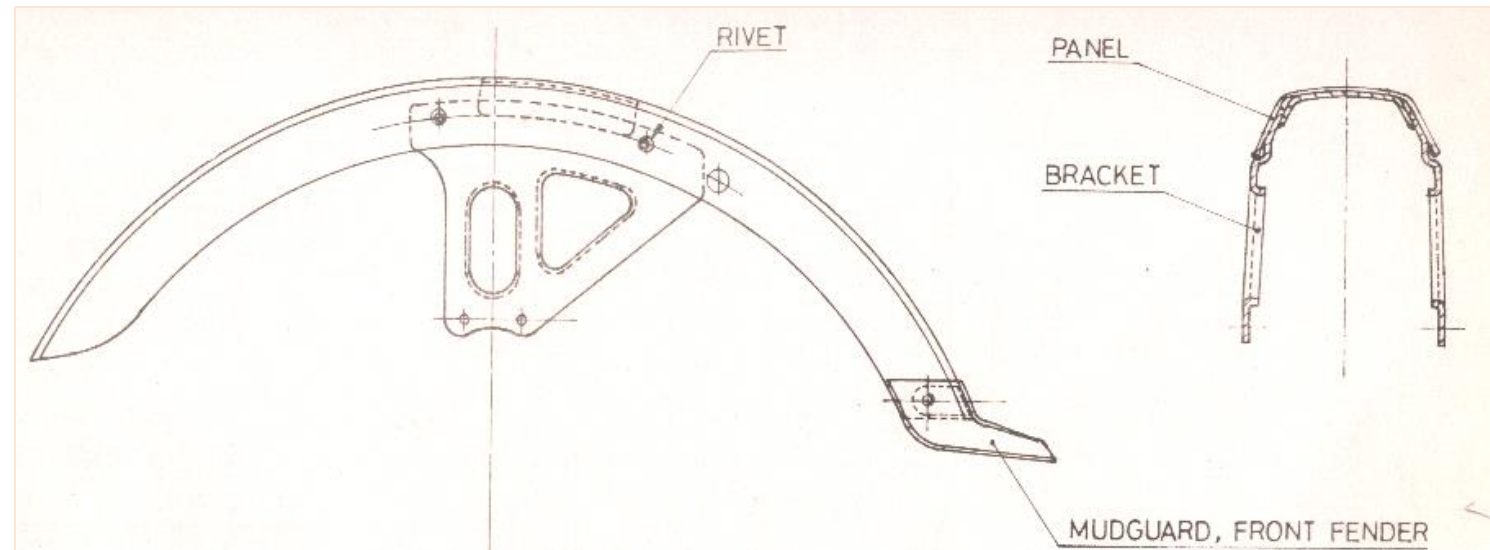
evaluation Phase- Function- Cost- Worth (After VE)



S. N.	Function	Cost Before VE (Rs/CAD)	Worth (Rs.) W	Cost (Rs) After VE Rs/CAD	Cost: Worth Ratio	
					Before VE	After VE
1.	Stop Matter	12.66/0.21	2.00	19.84/0.33	6.33	9.92
2.	Locate Parts	43.29/0.72	7.40	29.16/0.48	5.85	3.94
3.	Increase Strength	66.79/1.1	3.68	45.45/0.75	2.4	3.12
4.	Increase Durability	21.06/0.35	14.57	16.13/0.27	4.58	13.22
5.	Prevent Corrosion	19.93/0.3	1.22	15.90/0.26	17.26	2.45
6.	Enhance Aesthetics	8.86/0.15	6.5	4.07/.07	3.07	1.11
7.	Minimize Vibration	7.70/0.13	2.50	-	3.08	-
Total		180.29	37.87	130.55		

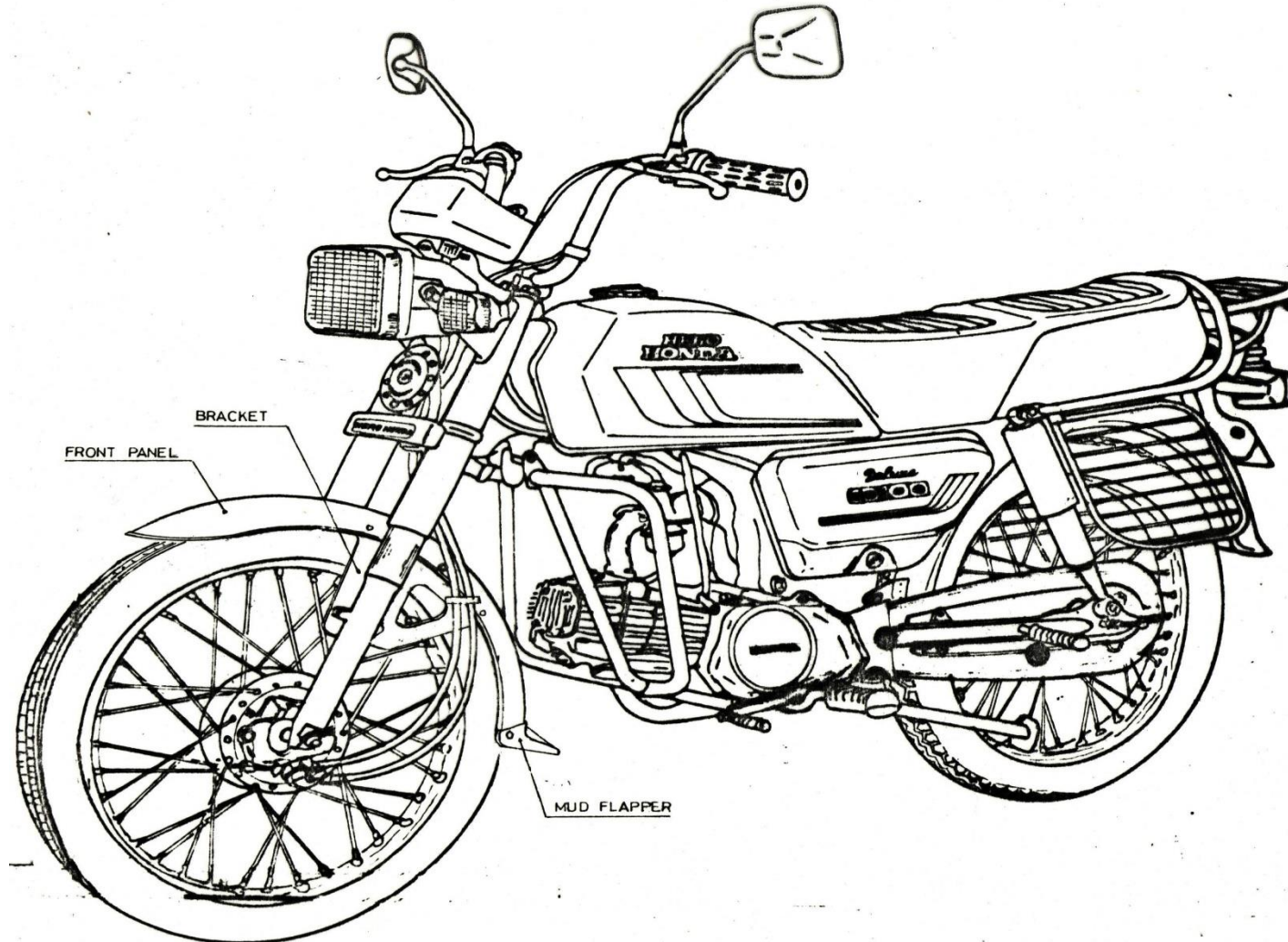


Recommendation Phase- Front Fender After VE and Before VE





Recommendation Phase CD100 Model (After VE)



Implementation Phase



1. **Prototype model testing on motor bikes.**
2. **Pre- production trials**
3. **Honda Motors & management approval**
4. **Batch Production for producibility**
4. **Mass production**
5. **Excellent Teamwork right through**



Recommendation phase-Benefits from V.E. Project



Saving Financials

(Rs/CAD)

Per Bike	49.74/0.8
Recurring/Year	62 M/1 M
% Saving	27.6



- Rusting Problem
- Warranty Complaints
- Customer Value
- Fender Performance
- Material Utilization
- Team Morale





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