

GL1800 Lower Cross Pipe Issue

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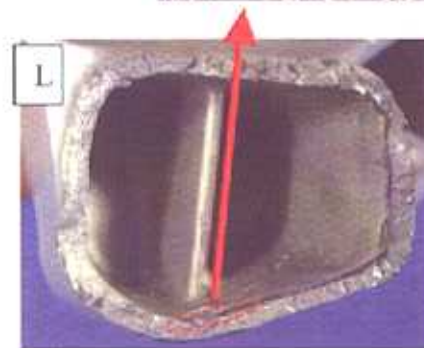
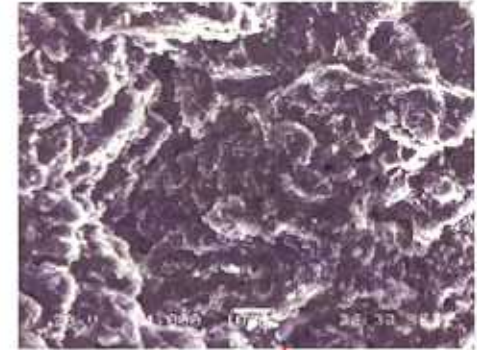
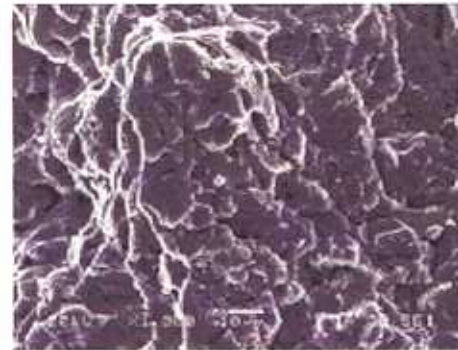


September 04, 2003

1. Confirmation of actual parts –①

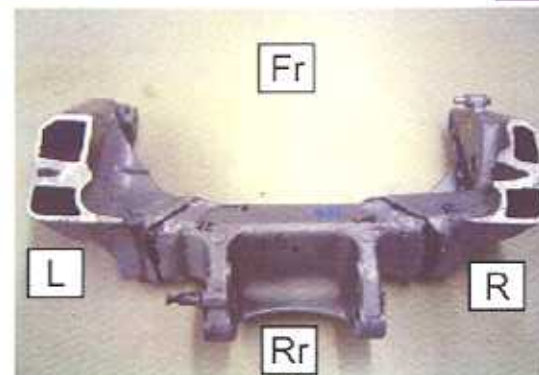
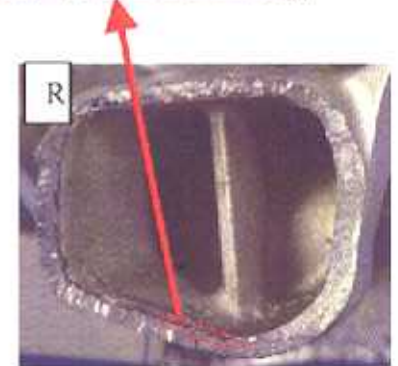
Analysis of broken surface

1. Breakage originated from the inside of the welded area.
2. Breakage was caused by a one-time impact. (Not fatigue broken)



Fr →

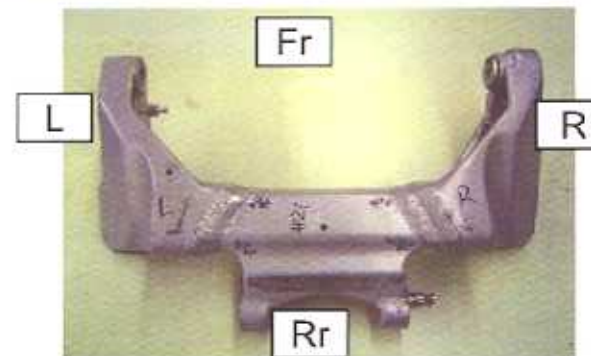
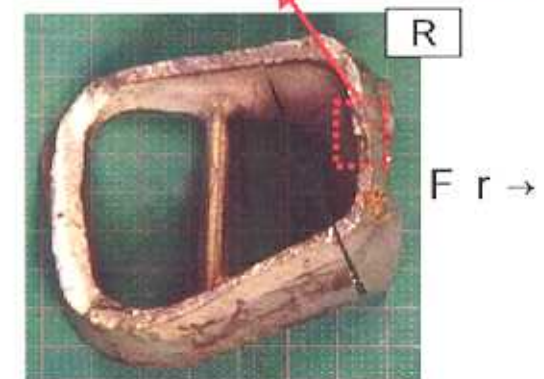
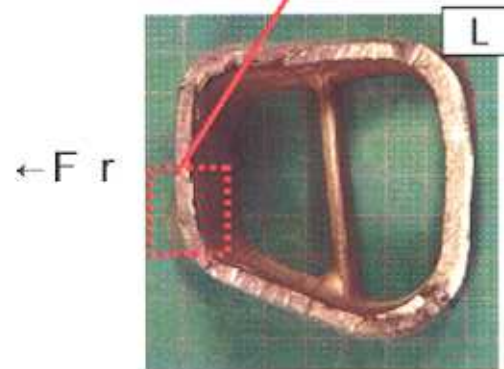
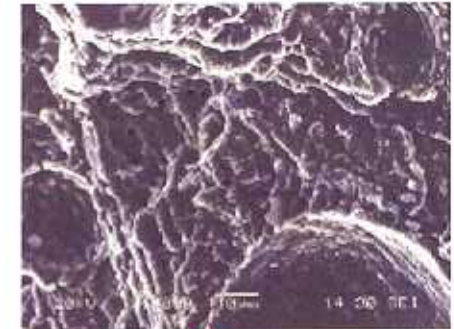
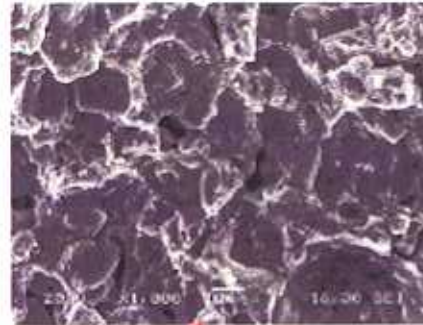
← Fr



1. Confirmation of actual parts –②

Analysis of Crack surface

1. Breakage originated from the inside of the welded area.
2. Breakage was caused by a one-time impact.
(Not fatigue crack)

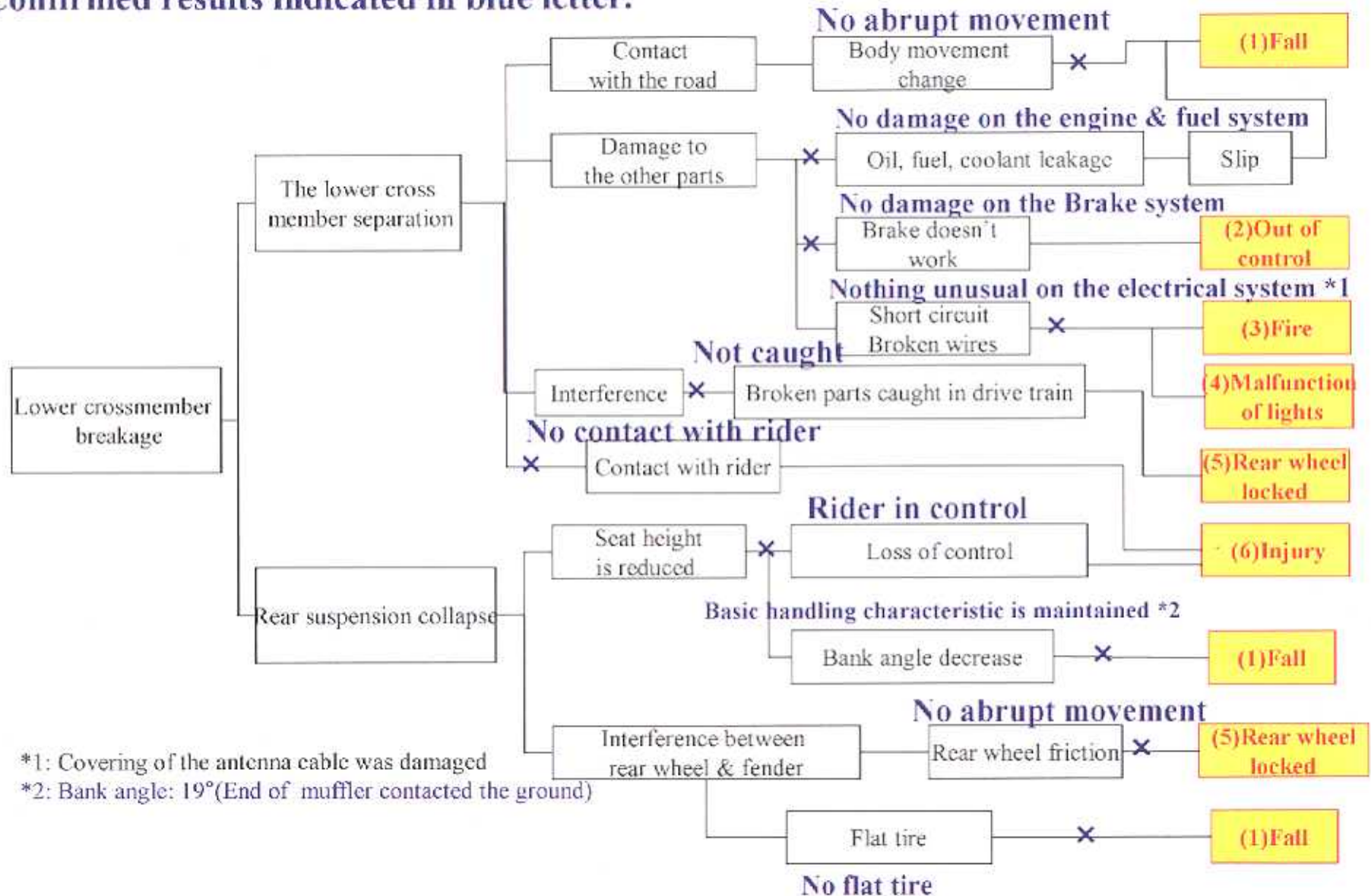


4. Predictability

Because there is no functional problem, customers cannot detect a problem until breakage occurs.

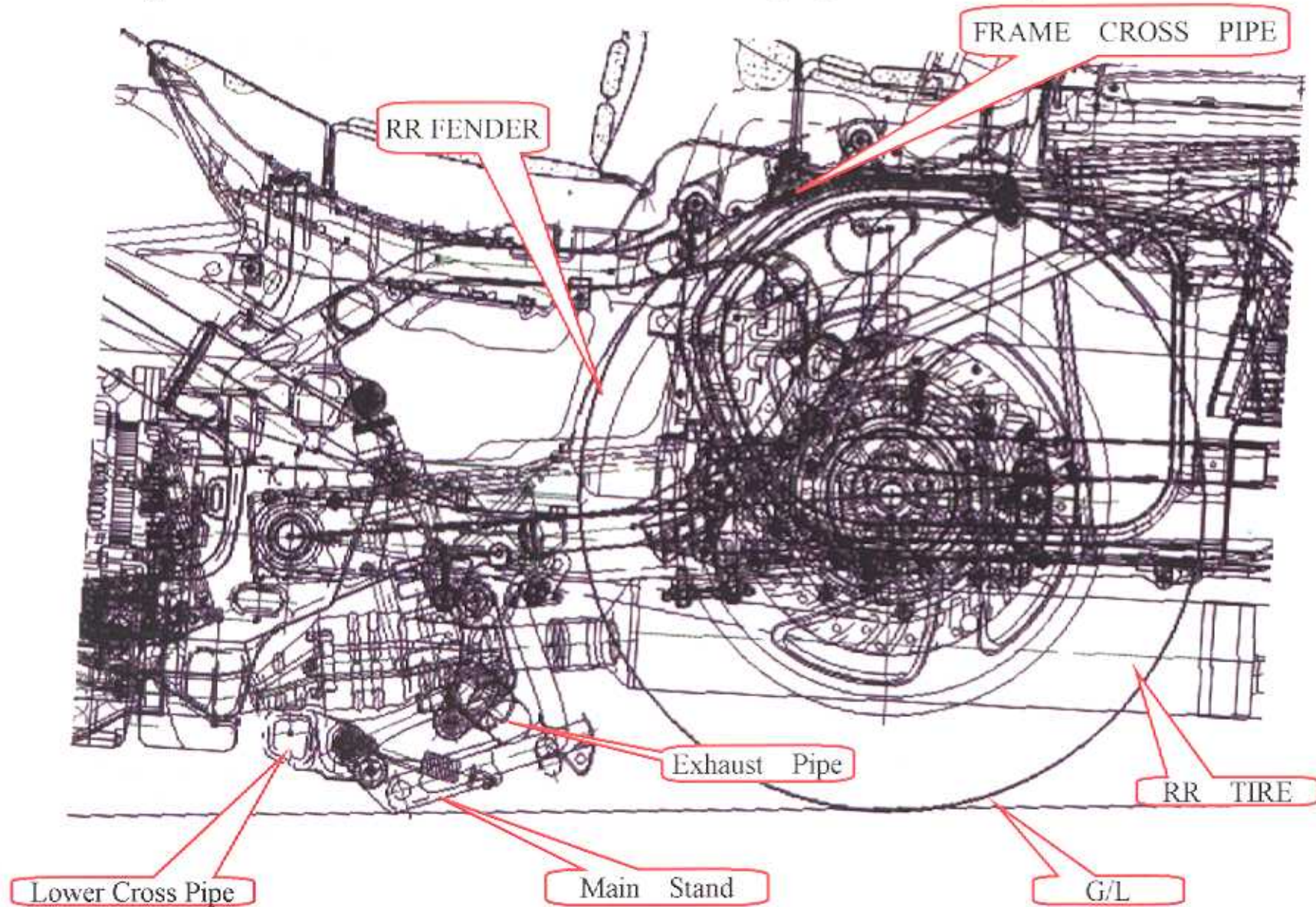
5. Safety Analysis — ①-1

Confirmed results indicated in blue letter.



5. Safety Analysis—①-2

【Tire position when the lower cross pipe breakage】



5. Safety Analysis—②

■ Summary

Even if the lower cross pipe breaks and rear tire contacts fender:

1. The vehicle can stop safely & under control.

At the moment of separation the rider will feel a slight shock however, safety is not affected as there will be no fall or loss of control.

The ability to stop the vehicle safely is not compromised even when the rear tire is in contact with the fender.

2. No separation related system failures will occur.

Braking, electrical, and fuel systems are not compromised.

3. No accident or injury has been reported.



This is not a safety issue

5. Safety Analysis — ③

■ Recreation test for the lower cross pipe breakage

Purpose : To confirm that the rear tire does not lock and result in loss of control when the lower cross pipe is broken and the rear tire is in contact with the fender.

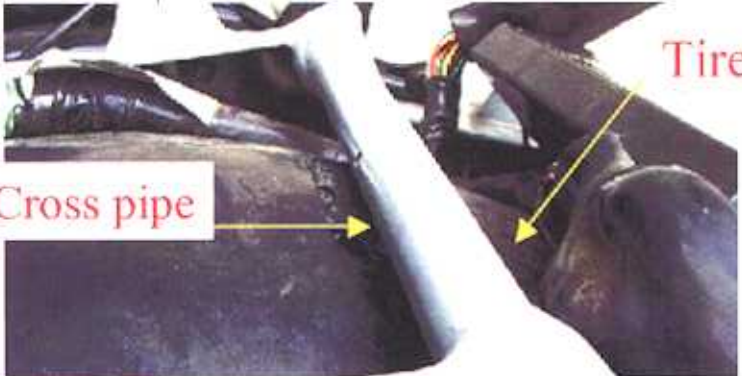

Test Condition : One rider (75kg) + Weight of Passenger (75kg) + Cargo Weight (30kg)

Contents of the videotape.

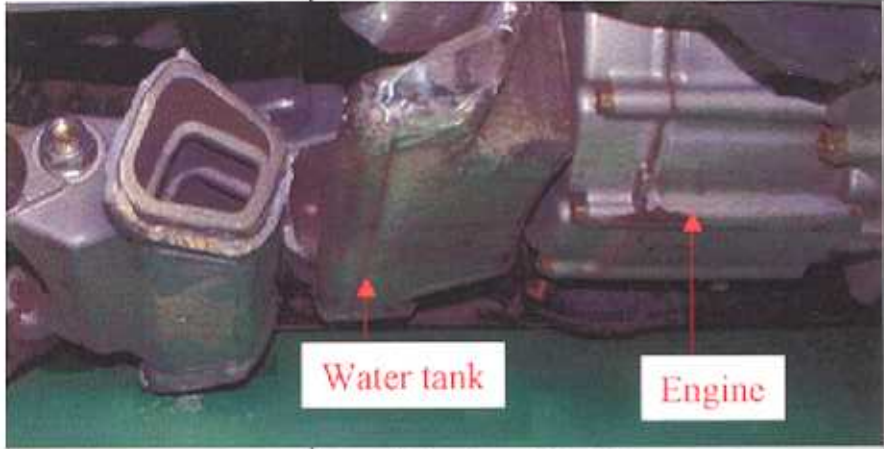

Running test when the lower cross pipe is broken.

1. STD vehicle's running condition while passing through a ramp
 2. Recreating broken lower cross pipe at the same running condition, to show body motion at the moment of separation until motorcycle is stopped.
- To show maneuverability in a straight and turning condition to avoid danger after the separation.


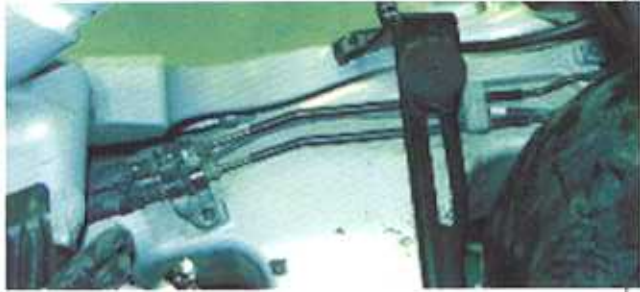



5. Safety Analysis—④

	potential problem	Phenomenon	Result
①	<p>Fall</p> <p>A puncture caused by interference between the rear tire and fender.</p> 	<p>The fender is made of plastic and no sharp parts are in contact with rear tire. The cross pipe is cylindrical.</p>	No puncture
	<p>The lower cross pipe contacts on the ground.</p> 	<p>The clearance between the pipe and the load surface is approximately 42mm; no contact. The bottom of the centerstand interferes with the road surface, but it does not impede running due to its curved shape.</p>	No abrupt movement

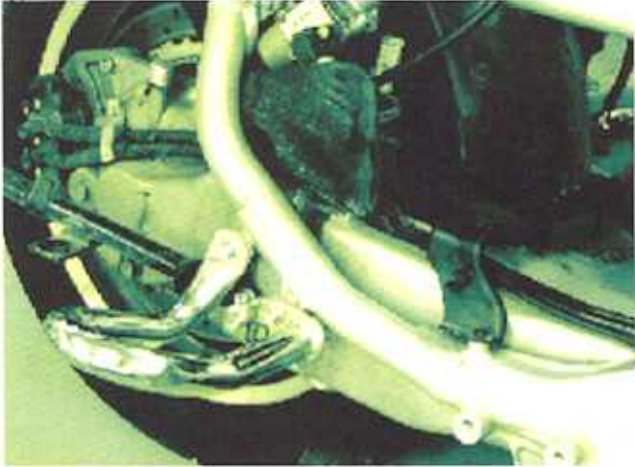
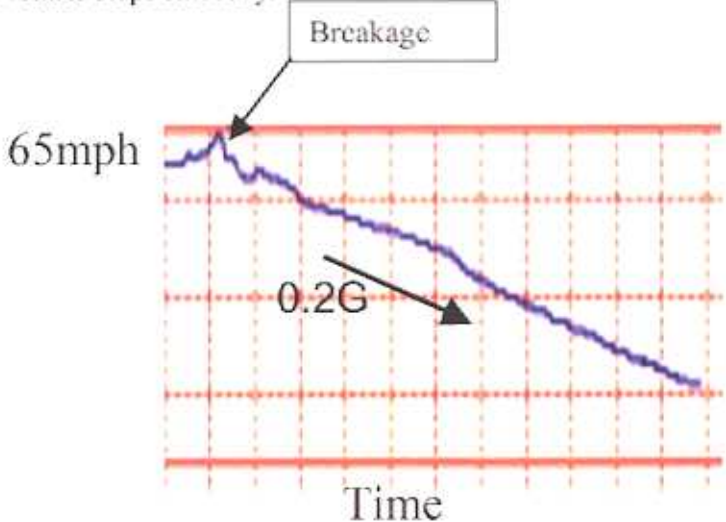
5. Safety Analysis — ⑤

		Potential problem	Phenomenon	Result
②	fall	Slip by leakage of oil or coolant 	The cross pipe hangs down out of place, but it does not come off nor cause any damage to the engine case and water tank.	No damage on the engine and cooling system.
		Bank angle decrease From the video of breakage test	dynamic bank angle is 19° Normal running and turning are still possible. 	Bank angle is slightly reduced.

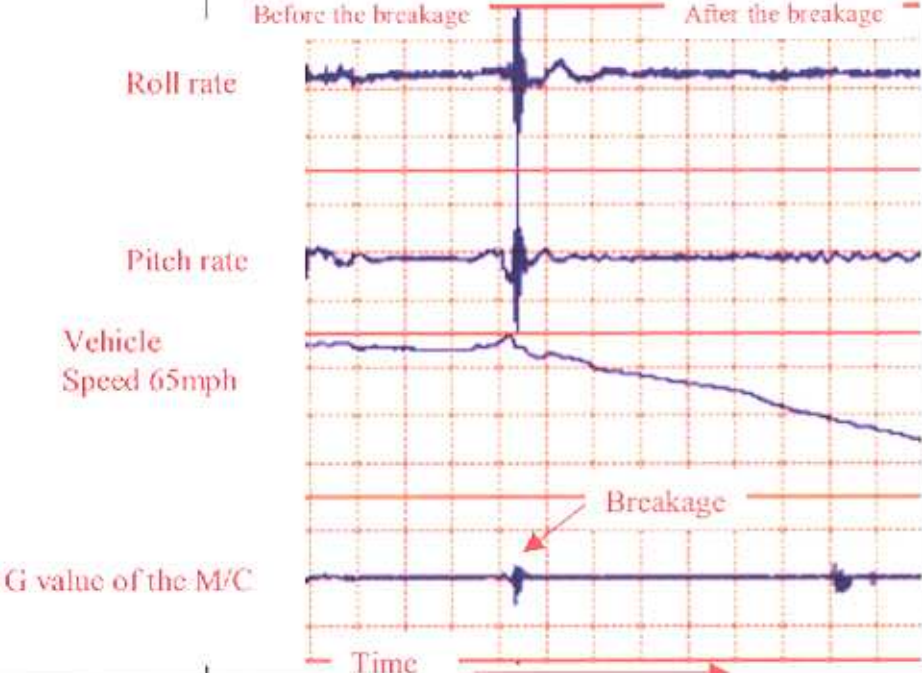
5. Safety Analysis—⑥

	Potential problem	Phenomenon	Result
②	<p>Loss of control</p> <p>Failure of drive train, transmission or braking system.</p> <p style="text-align: center;">Pedal area</p> 	<p>No interference to related components</p> <p style="text-align: center;">Brake pipe</p> 	<p>No damage to any related components</p> <p style="text-align: center;">Caliper area</p> 
③	<p>Fire</p> <p>Electrical harness, open circuit and short circuit</p>	<p>No harness open circuit or short circuit after separation and prior to stopping</p> 	<p>Electrical system is normal</p>
④	<p>lights inoperative</p> <p>Lights become inoperative before stopping.</p>		

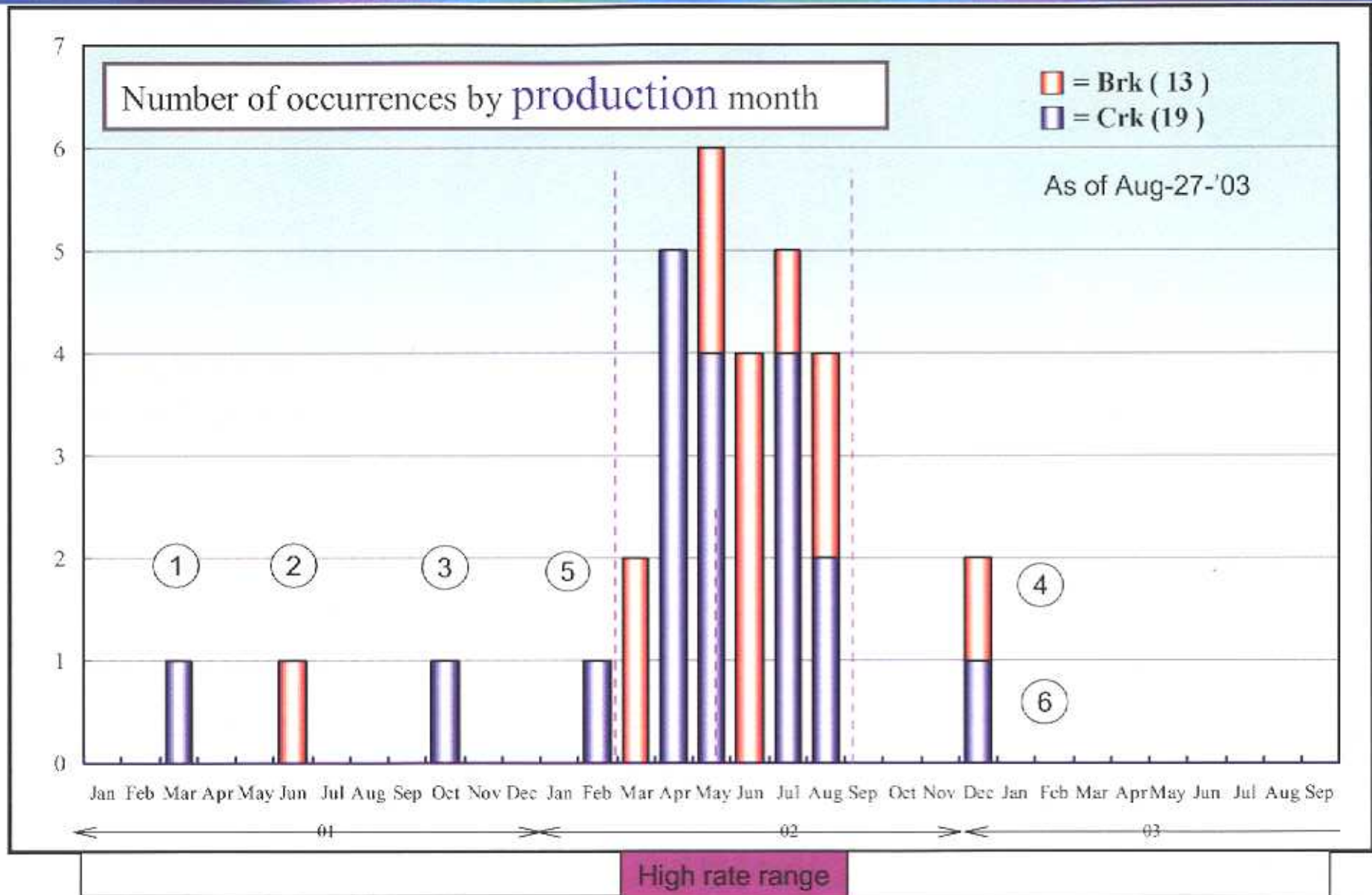
5. Safety Analysis — ⑦

	Potential problem	Phenomenon	Result
⑤	<p>Lock of the rear wheel</p> <p>In case any broken parts are caught in the rear wheel, they may cause a lock.</p>	<p>① No parts are caught in the rotating unit, no damage of the swing arm, drive shaft, and final gear.</p> 	<p>No rear wheel lock occurs.</p>
	<p>Rear tire lock caused by interference from contact with fender.</p>	<p>During interference, the tire is not locked. The speed reduction is smooth, and the vehicle stops smoothly.</p> 	

5. Safety Analysis — ⑧

	Potential problem	Phenomenon	Result
⑥ Injury of the rider	Possibility of the rider being thrown from the bike by the shock of the cross pipe failure.	<p>Very slight shock at the moment of failure. No significant difference in pitch rate and roll rate of body before and after the failure.</p> 	Rider remains on motorcycle.
	Parts dislodged from motorcycle can cause injury to the rider.	No parts are dislodged	No injury to rider.

8 . Investigation of units outside of the range — ①



8. Investigation of units outside of the range — ②

	1	2	3	4	5	6
Mfg	Mar/'01	Jun/'01	Oct/'0 1	Dec/'02	Feb/'02	Dec/'02
State	LA	FL	NE	MI	PA	NY
Mile	50,067	1,416	27,634	3,445	17900	9387
Crk/Brk	Crk	Brk	Crk	Brk	Crk	Crk
Object	Unk	Pothole	Unk	Pothole		
Size	Unk	8"(depth)	Unk	(It felt big)		
MPH	Unk	35	Unk	20-25		
Riding		Single	Single	Single		
Weight of Rider						
Check result	Crack found at the seat rail.		Crack found at the seat rail.		Under investigation	

We believe the six cases experienced sudden large impact.



The End