



भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
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Government of India-Ministry of Railways
Research Designs & Standards Organisation
Lucknow - 226 011
DID (0522) 2450115
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No. SV. FIAT Spring

Date: 22.01.2020

Principal Chief Mechanical Engineer,

1. Northern Railway, Baroda House, New Delhi-110 001.
2. Western Railway, Churchgate, Mumbai-400020.
3. Central Railway, CSTM, Mumbai - 400 001.
4. Eastern Railway, Fairly Place, Kolkata- 700 001.
5. Southern Railway, Park Town, Chennai - 600 003
6. North East Frontier Railway, Maligaon, Guwahati- 781 011.
7. North Eastern Railway, Gorakhpur-273 001.
8. South Eastern Railway, Garden Reach, Kolkata-700 043.
9. South Central Railway, Secunderabad-500 071.
10. West Central Railway, Jabalpur- 482 001.
11. South East Central Railway, Bilaspur- 495 004.
12. South Western Railway, Hubli- 580023.
13. East Coast Railway, Railway Complex, Bhubaneswar- 751 023.
14. East Central Railway, Hazipur-844 101.
15. North Western Railway, Jaipur-302 006.
16. North Central Railway, Allahabad-211 001.
17. Konkan Railway Corporation Ltd., Corporate office, Belapur Bhawan, Navi Mumbai – 400 614.

Sub: Formats for analysis and reporting of coil springs and air springs failures in FIAT bogies.

Ref: i. This office letter of even no. dated 09.10.2019 (copy enclosed), 15.03.2019 & 22.10.2018.

ii. This office letter No. SV.EMU.RAS dated 20.12.2019.(copy enclosed)

iii. DME (Chg.)/Railway Board's letter No.2007/M(C)/137/8 dated 28.11.2019.

Vide letter under reference (i), format for analysis and reporting of coil springs failures cases in FIAT bogies was circulated for meaningful analysis and identification of root cause for spring failures.

Vide letter under reference (ii), format for reporting of failure cases of air springs, air suspension control equipments and FIBA devices was circulated.

Above mentioned formats were circulated, so that complete details are available for analysis (Coach type-wise, Railway-wise, Make-wise, in comparison to coach type-wise population etc.) and root cause identification.

With reference to letter under reference (iii), failure reports for coil springs and air springs in FIAT bogies have been received from Zonal Railways in different formats, without complete details required for effective analysis.

It is again requested to provide a compiled analysis of failures of coil springs and air springs – FIBA – air suspension control equipments in enclosed formats (Annexure A & Annexure 1,2 & 3 respectively) for the years 2018-19 & 2019-20 (till December, 2019) by 25.01.2020. Individual failure reports of coil spring failures are also to be submitted regularly in the format (Annexure B) circulated vide letter SV.FIAT Spring dated 18.07.2018 (copy enclosed).

DA: As above.

(Samir Lohani)

Executive Director (Standards)/Carriage

Copy to:

EDME (Coaching), Railway Board, Rail Bhawan, New Delhi – 110 001.



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REMINDER

Date: 09.10.2019

No. SV. FIAT Spring

Principal Chief Mechanical Engineer,

1. Northern Railway, Baroda House, New Delhi-110 001.
2. Western Railway, Churchgate, Mumbai-400020.
3. Central Railway, CSTM, Mumbai - 400 001.
4. Eastern Railway, Fairly Place, Kolkata- 700 001.
5. Southern Railway, Park Town, Chennai - 600 003
6. North East Frontier Railway, Maligaon, Guwahati- 781 011.
7. North Eastern Railway, Gorakhpur-273 001.
8. South Eastern Railway, Garden Reach, Kolkata-700 043.
9. South Central Railway, Secunderabad-500 071.
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11. South East Central Railway, Bilaspur- 495 004.
12. South Western Railway, Hubli- 580023.
13. East Coast Railway, Railway Complex, Bhubaneswar- 751 023.
14. East Central Railway, Hazipur-844 101.
15. North Western Railway, Jaipur-302 006.
16. North Central Railway, Allahabad-211 001.
17. Konkan Railway Corporation Ltd., Corporate office, Belapur Bhawan, Navi Mumbai – 400 614

Sub: Analysis and reporting of coil springs failure cases in FIAT bogies.

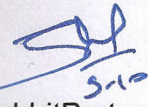
Ref: This office letter of even no. dated 15.03.2019.

Vide letter under reference, compiled data and analysis of coil springs failure cases in FIAT bogie were requested from Zonal Railways in a updated format for meaningful analysis and identifying root cause coil spring failures.

So far, compiled data and analysis in the format have been received from CR & WR, only.

It is again requested to submit compiled data and analysis in the format attached herewith as Annexure –‘A’ along-with regular submission of individual failure reports. Zonal Railways are requested to submit analysis in the format attached as Annexure –‘A’ for the Years 2018-19 & 2019-20 till September, 2019. Analysis for the Years 2018-19 & 2019-20 are to be submitted separately.

DA: As above.


(ShobhitPratap Singh)
Jt. Director/VDG/Carriage
for Director General/Carriage

Copy to:

DME (Coaching), Railway Board, Rail Bhawan, New Delhi – 110 001.

ANALYSIS REPORTS OF FAILURES CASES OF FIAT BOGIE COIL SPRINGS**(1) Railways:**

Period covered from _____ to _____

S.NO.	COACH CODE FOR REPORT	COACHES INCLUDED
1	LS	LS, LS1,LS2, LS3 ,LS5 ,LGS ,LWS
2	LDSLRL	LDSLRLA, LGSLRL, LGSLD
3	LWACCN	3TIER LHB AC COACH.
4	LWACCW	ALL 2 TIER LHB AC COACHES
5	LFAC	ALL 1st AC LHB COACH.
6	LWCB	ALL LHB PANTRY CARS.
7	LWSCN	ALL 3 TIER LHB NON AC RESERVED COACH.
8	LWLRRM	ALL LHB POWER CARS.
9	LWSCZ	LHB NON AC CHAIR CAR.
10	LWSCZAC	LHB AC CHAIR CARS.

(2) Coach type wise holding of LHB coaches of the Railway:

S.NO.		LS	LDSLRL	LWACCN	LWACCW	LFAC	LWCB	LWSCN	LWLRRM	LWSCZ	LWSCZAC
1	Holding with Air spring in secondary suspension										
2	Holding with coil spring in secondary suspension										

(3) Number of failure in primary suspension in the light of secondary suspension:

(a)	Total number of cases of Primary Outer spring failure, in which air springs were in secondary suspension.	
(b)	Total number of cases of Primary Outer spring failure, in which coil springs were in secondary suspension.	
(c)	Total number of cases of Primary Inner spring failure, in which air springs were in secondary suspension.	
(d)	Total number of cases of Primary Inner spring failure, in which coil springs were in secondary suspension.	

(4) Number of failed springs (Built wise):

S.NO.	Built wise	Population in the Railway	Total number of Cases of failure of primary Outer spring	Total number of Cases of failure of primary Inner spring	Total number of Cases of failure of secondary Outer spring	Total number of Cases of failure of secondary Inner spring
1	ICF					
2	RCF					
3	MCF					

(5) Number of failed Primary Outer Spring (Coach type-wise):

S.NO.	Make	LS	LDSL	LWACCN	LWACCW	LFAC	LWCB	LWSCN	LWLRRM	LWSCZ	LWSCZAC
1	RSK										
2	GRUEBER										
3	FSK										
4	G B SPRING										
5	ABOK										
6	HZP										
7	LPDN										
8	L&S										
9	BPS										
10	OTHER										

(6) Number of failed Primary Inner Spring (Coach type-wise):

S.NO.	Make	LS	LDSL	LWACCN	LWACCW	LFAC	LWCB	LWSCN	LWLRRM	LWSCZ	LWSCZAC
1	RSK										
2	GRUEBER										
3	FSK										
4	G B SPRING										
5	ABOK										
6	HZP										
7	LPDN										
8	L&S										
9	BPS										
10	OTHER										

(7) Number of failed Secondary Outer Spring (Coach type-wise):

S.NO.	Make	LS	LDSL	LWACCN	LWACCW	LFAC	LWCB	LWSCN	LWLRRM	LWSCZ	LWSCZAC
1	RSK										
2	GRUEBER										
3	FSK										
4	G B SPRING										
5	ABOK										
6	HZP										
7	LPDN										

8	L&S										
9	BPS										
10	OTHER										

(8) Number of failed Secondary Inner Spring (Coach type-wise):

S.NO.	Make	LS	LDSLRL	LWACCN	LWACCW	LFAC	LWCB	LWSCN	LWLRRM	LWSCZ	LWSCZAC
1	RSK										
2	GRUEBER										
3	FSK										
4	G B SPRING										
5	ABOK										
6	HZP										
7	LPDN										
8	L&S										
9	BPS										
10	OTHER										

(9) Number of failed Primary Outer Spring (Spring age-wise):

S.NO.	Make	0-1 year	1-2 year	1-2 year	2-3 year	4-5 year	5-6 year	MORE THAN 6 YEARS
1	RSK							
2	GRUEBER							
3	FSK							
4	G B SPRING							
5	ABOK							
6	HZP							
7	LPDN							
8	L&S							
9	BPS							
10	OTHER							

(10) Number of failed Primary Inner Spring (Spring age-wise):

S.NO.	Make	0-1 year	1-2 year	1-2 year	2-3 year	4-5 year	5-6 year	MORE THAN 6 YEARS
1	RSK							
2	GRUEBER							
3	FSK							
4	G B SPRING							
5	ABOK							
6	HZP							
7	LPDN							
8	L&S							
9	BPS							
10	OTHER							

(11) Number of failed Secondary Outer Spring (Spring age-wise):

S.NO.	Make	0-1 year	1-2 year	1-2 year	2-3 year	4-5 year	5-6 year	MORE THAN 6 YEARS
1	RSK							
2	GRUEBER							
3	FSK							
4	G B SPRING							
5	ABOK							
6	HZP							
7	LPDN							
8	L&S							
9	BPS							
10	OTHER							

(12) Number of failed Secondary Inner Spring (Spring age-wise):

S.NO.	Make	0-1 year	1-2 year	1-2 year	2-3 year	4-5 year	5-6 year	MORE THAN 6 YEARS
1	RSK							
2	GRUEBER							
3	FSK							
4	G B SPRING							
5	ABOK							
6	HZP							
7	LPDN							
8	L&S							
9	BPS							
10	OTHER							

(13) Location of Failure in Springs:

Type of Springs	No. of cases of coil spring failures within 1.5 coil from top	No. of cases of coil spring failures within 1.5 coil from bottom	No. of cases of coil spring failures at any other location in between
Primary Outer			
Primary Inner			
Secondary Outer			
Secondary Inner			

(14) Number of incidences in which primary damper were found defective in cases of primary spring failure:-

PROFORMA FOR REPORTING BROKEN/FAILED PRIMARY LHB SPRING**TO RDSO**

Coach No. Transportation Code Train No.

Date of Failure Primary Depot

Schedule Particulars:

Detected during Maintenance / En-Route Failure

Inner / Outer Spring Bogie No.

A. Spring data:

1. Location of the spring in coach:
2. Make of the spring:
3. Marking:
4. Manufacturer , Month and Year of Manufacture
5. Failure:
 - a. Failed Coil No. (from bottom)
 - b. Fatigue / Sudden failure
 - c. Pitting /Tool marks at Failure point
 - d. Evidence of coils rubbing
 - e. Condition of Paint / Surface protection

B. Data at Fitment Location of Spring:

1. Orientation of defective primary spring (OK / Not OK):
2. Indicate condition (cracks / wear / damage) on:
 - a. Centering Disc lower:
 - b. Centering Disc upper:
 - c. Rubber Pad :
 - d. Upper Rubber spacer :
 - e. Control Arm Silent Block :
3. Wheel condition (flat / shelling etc.):
4. Primary Vertical Damper condition:
 - a. Leakage:
 - b. Deficiency / damages:

C. Investigation at other locations of bogie:

1. Visual: Conditions of other dampers of bogie (OK/Not OK):
2. Primary Bump stop gap:
3. Whether Proper coupling of secondary springs:
4. Lateral clearance (bolster and cross member):
5. Longitudinal clearance (bolster and cross member):

D. Photograph showing failure section of spring:

E. Any other relevant information:

Note:

1. Defective components / Improper clearances noticed have to be replaced / rectified before giving fitness to the coach.
2. It is advised that in the following cases:
 - a) where coach sick marking history shows that coach was marked sick earlier in last 6 months due to bogie related defect, or
 - b) primary spring breakage resulted in enroute – coach detachment,primary depots may replace the primary vertical damper at failure location (B.4) with a pre-tested unit exchange damper and send the replaced damper to workshop for testing. The damper test report should also be enclosed with this proforma.



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Government of India-Ministry of Railways
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Lucknow - 226 011
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No. SV.EMU.RAS

Dated: 20.12.2019

Principal Chief Mechanical Engineers,

1. Northern Railway, Baroda House, New Delhi-01
2. Western Railway, Churchgate, Mumbai-20
3. Central Railway, CSTM, Mumbai - 400 001
4. Eastern Railway, Fairly Place, Kolkata- 01
5. Southern Railway, Park Town, Chennai - 03
6. North East Frontier Railway, Maligaon, Guwahati- 11
7. North Eastern Railway, Gorakhpur-01
8. South Eastern Railway, Garden Reach, Kolkata-43
9. South Central Railway, Secunderabad-71
10. West Central Railway, Jabalpur- 01
11. South East Central Railway, Bilaspur- 04
12. South Western Railway, Hubli- 23
13. East Coast Railway, Railway Complex, Bhubaneswar- 23
14. East Central Railway, Hazipur-01
15. North Western Railway, Jaipur-06
16. North Central Railway, Allahabad-01
17. Konkan Railway Corporation Ltd., Corporate office, Belapur Bhawan, Navi Mumbai - 14

Sub: Reporting of :-

- (i) Failure cases of air spring.
- (ii) Failure cases of Air Suspension Control Equipments.
- (iii) Failure cases of FIBA Device.


- Ref:**
- 1) This office letter no. SV.EMU.RAS dated 30.08.2019.
 - 2) This office letter no. SV.FIAT dated 01.06.2018.

Maintenance instructions for Air Springs, FIBA and Air Suspension Control Equipments of LHB coaches are contained in CAMTECH maintenance manual for LHB coaches and this office letters under ref (i) & (ii). Reports of failures in air springs are not being sent by Zonal Railways to RDSO. Only total number of failures is communicated. These reports are not having any details required for effective failure analysis. Sometimes failure of air spring, FIBA and Air suspension control equipments are intermixed. Due to this proper root cause analysis of failure becomes difficult.

Hence, formats for reporting of compiled failure cases of air spring (Annexure - 1), FIBA (Annexure - 2) and Air suspension control equipments (Annexure - 3) have been prepared. Along with compiled details of failures in enclosed formats, detailed investigation report of individual case with photographs should also be submitted.

It is requested to send details of failures of air springs, FIBA & air suspension control equipments for 2018-19 and 2019-20 in enclosed formats along with detailed investigation reports of individual failure case with photograph to enable this office for effective failure analysis. Google sheet for submission of compiled failure cases of Air Springs, FIBA and Air Suspension Control Equipments has also been shared with Zonal Railways.

DA: As above


(Shobhit Pratap Singh)
Jt. Director/Carriage
for Director General/Carriage

Copy To:

1. CDE (Mech), Rail Coach Factory, Kapurthala.
2. CDE (Mech), Integral Coach Factory, Chennai.
3. CDE (Mech), Modern Coach Factory, Rae Bareilly
4. DME (Chg.), Railway Board, Rail Bhawan, New Delhi.

Format for reporting of failed air spring cases**Table- A**

S. No.	Date of failure	Train No.	Terr. Rly	PM Depot	Coach No. and Railway	Type of coach	Make of air spring	Capacity of air spring (140 KN / 120 KN /180 KN)	S. No. of air spring	PU B/Year of coach	Last shop schedule / Workshop	*Nature of failure	Failure detected en-route line/during maintenance	Action taken
			Stn / section											

* Details of nature of failure are as under:

- 1) #Leakage through spigot.
- 2) Surface crack on bellow.
- 3) Bursting of air bellow.
- 4) Leakage between air bellow and top plate/emergency spring.
- 5) Rubbing of air bellow with any other part.
- 6) Other.

*In case of leakage through spigot, following details are also required:

Table- B

Corresponding S. No. in Table - A	Condition of O-rings over spigot	Make of bogie bolster	Flatness of bolster surface in general and at Dome cum air reservoir (which meets with top plate of air spring)	Presence of burrs/chips/sharp edges in dome of bolster meeting with spigot of air spring	Leakage from Dome cum air reservoir of bogie bolster.

Note:

- 1) Failure reports of air spring shall be sent in above format.
- 2) Detailed investigation report of individual failure case to be sent separately with photographs.

Format for reporting of failed air suspension control equipments

S. No.	Date of failure	Train No.	Terr. Ry.		PM Depot	Coach No. and Railway	Type of coach	Make of air suspension control equipment	PU B/Year of coach	Last shop schedule / Workshop	*Nature of failure	Failure detected en-route line/during maintenance	Action taken
			Stn/	section									

*Details of nature of failure are as under:

- 1) Leakage / malfunctioning of Leveling valve.
- 2) Leakage / malfunctioning of Duplex check valve.
- 3) Leakage / malfunctioning of Two way dirt collector.
- 4) Leakage / malfunctioning of Check valve (NRV).
- 5) Leakage / malfunctioning of Isolating cock.
- 6) Leakage / malfunctioning of Drain cock.
- 7) Leakage / malfunctioning of Drain valve.
- 8) Leakage from flexible hose pipe.
- 9) Leakage from Main reservoir.
- 10) Leakage from Auxiliary reservoir.
- 11) Broken or bend installation lever.

Note:

- 1) Failure reports of air suspension control equipments shall be sent in above format.
- 2) Detailed investigation report of individual failure case to be sent separately with photographs.

Format for reporting of failed FIBA Device

S. No.	Date of failure	Train No.	Terr. Rly	PM Depot	Coach No. and Railway	Type of coach	Make of FIBA	S. No. of FIBA / indicator	PU	Last shop schedule / Workshop	*Nature of failure	Failure detected en-route line/during maintenance	Action taken
			Stn/section						B/Year of coach				

*Details of nature of failure are as under:

- 1) Leakage / malfunctioning of FIBA
- 2) Leakage / malfunctioning of Indicators.
- 3) Leakage / malfunctioning of Isolating cock.
- 4) Leakage from flexible hose pipe.

Note:

- 1) Failure reports of FIBA Device shall be sent in above format.
- 2) Detailed investigation report of individual failure case to be sent separately with photographs.