RAIL COACH FACTORY, KAPURTHALA

Office of the
Principal Chief Electrical Engineer

No.: RCF/HSQ/ED/CAI/2126 Date: 27.06.2025

A. Principal Chief Mechanical Engineer:	
1.	Central Railway, CST, Mumbai – 400 001
2.	Eastern Railway, Fairlie Place, Kolkata – 700 001
3.	East Central Railway, Dighi, Distt. Vaishali, Hajipur, Bihar – 844 101
4.	East Coast Railway, Bhuvneshwar, Orrisa – 751 016
5.	Northern Railway, Baroda House, New Delhi – 110 001
6.	North Central Railway, Subedarganj, Prayagraj – 211 015
7.	North Eastern Railway, Gorakhpur – 273 001
8.	North East Frontier Railway, Maligaon, Guwahati – 781 001
9.	North Western Railway, Jaipur – 302 006
10.	Southern Railway, Park Town, Chennai – 600 003
11.	South Central Railway, Rail Nilayam, Secunderabad – 500 371
12.	South Coast Railway, Visakhapatanam – 530 004
13.	South Eastern Railway, Garden Reach, Kolkata – 700 043
14.	South East Central Railway, Bilaspur – 495 004
15.	South Western Railway, Gadag Road, Hubli – 580 020
16.	Western Railway, Churchgate Station Building, Mumbai – 400 020
17.	West Central Railway, Jabalpur – 482 001
B.	
1.	PED/PS & EMU, RDSO, Lucknow – 226 011
2.	Chief Electrical Design Engineer, Integral Coach Factory, Chennai – 600 038
3.	Chief Electrical Design Engineer, Modern Coach Factory, Raebareli – 229 120

Sub: Coach Alteration Instruction (CAI) for Improvement in mounting arrangement of under-slung 500kVA power pack and Maintenance guidelines for under-slung 500kVA power pack.

Ref: Railway Board L.No. 2001/Elect. (G)/138/5 dated 11.04.2025.

Reference above, Coach Alteration Instruction for Improvement in mounting arrangement of under-slung 500kVA power pack and Maintenance guidelines for under-slung 500kVA power pack is being issued for further necessary action please.

S.No.	Doc. No.	Description
1.	ED/CAI/042, Rev.-0 dated 27.06.2025	Coach Alteration Instruction for Improvement in mounting arrangement of under-slung 500kVA power pack and Maintenance guidelines for under-slung 500kVA power pack

This has approval of the competent authority.

DA:
1. ED/CAI/042, Rev.-0 dated 27.06.2025

(Kulwinder Singh)
Dy. Chief Electrical Engineer/D&D
For Principal Chief Electrical Engineer

RAIL COACH FACTORY, KAPURTHALA

CAI NO.: ED/CAI/042 dated: 27.06.2025

COACH ALTERATION INSTRUCTION FOR IMPROVEMENT IN MOUNTING ARRANGEMENT OF UNDER-SLUNG 500 kVA POWER PACK AND MAINTENANCE GUIDELINES FOR UNDER-SLUNG 500 kVA POWER PACK

86

1. **Foreword:**
This Coach alteration Instruction is prepared for provision of Safety brackets for under-slung power pack and issue of Interim Maintenance Guidelines based on OEM recommendations, till final maintenance manual is advised by CAMTECH.

2. **Reference:**
(i.) Railway Board L.No. 2001/Elect. (G)/138/5 dated 11.04.2025.
(ii.) RCF PO No. T1720606 dated 26.03.2018 on M/s Cummins, Pune, Qty: 8 set.
(iii.) RCF PO No. T1125006 dated 05.08.2011 on M/s Kirloskar Electric Co. Ltd., Bengaluru, Qty: 1 set.
(iv.) RCF PO No. T1125007 dated 11.08.2011 on M/s BHEL Elect. Machines Ltd., Kasaragod, Qty: 1 set.

3. **Reason for modification:**
1. To prevent failure of AVMs provided in mounting arrangement of under-slung power packs in under-slung type power cars.
2. Preventive check for all under-slung type power cars.
3. Provision of safety-bracket (J-Bracket) for additional safety in case of AVM failures.
4. Issue of special maintenance instructions for under-slung type power cars.

4. **Details of Modification:**
Modification involves:
- Provision of Safety brackets.
- Interim Maintenance Guidelines for under-slung power packs.

These modifications are covered in clause no. 7 in detail.

5. **Coaches concerned:**
LHB EOG 1x500 kVA under-slung type Power Car.

6. **Implementation by:**
1. Implementation by workshop during POH or during Refurbishment by Coach Rehabilitation workshop with immediate effect.
2. Maintenance instructions to be implemented as per schedules mentioned in this CAI by workshops.

7. **Implementation Stage:**
This clause covers various activities involved in provision of Safety Bracket for DA set. Steps are as under:

Step-1:- Check for Mounting Arrangement and AVMs:
1. Dismount the DA set from the coach and check the condition of the mounting arrangement for any deformity or damage and necessary action may be taken in

consultation with M/s Cummins. Check the condition of all mounting hardwares of under-slung 500KVA power pack/replace with approved part nos.

2. Presently, 4 nos. AVMs are provided on alternator fixing brackets and 2 nos. on engine side and 8 nos. on H & I brackets. The torquing of individual AVM shall be checked as per recommendations of M/s Cummins.
3. Check the condition of anti-fall arrangement bolt w.r.t M/s Cummins drg/part no. 4958633 alongwith safety washer and split pin. Any item found rusted/corroded shall be replaced with approved part no. of M/s Cummins and torquing as recommended by M/s Cummins.
4. All hardware and accessories shall be checked and on condition basis, replace if required, as per the approved part nos. of M/s Cummins.
5. Check the health of all AVMs alongwith the hardware and provision of spacers. Replace, if required.
6. Check the worked out life span of AVMs provided with respect to OEMs recommendations and replace, if required. If the AVMs have completed the span of 4 years of operation, replace in consultation with M/s Cummins as mentioned in maintenance instructions of M/s Cummins.

Step-2:- Provision of safety bracket:

1. Check if, the safety bracket is provided and if provided, the condition of safety bracket shall be examined for rusting / any damage. If required, the same shall be replaced.
2. In coaches not provided with safety bracket, provision shall be made as per Cummins drawing no. 5275255 and for reference, fig. no. 1 to 3 of this CAI may be referred.
3. Brackets to M/s Cummins drg/part nos. 4959200 (2 nos.) and 5277416 (1 no.) shall be provided as shown in fig. no 2. Only approved part nos. with approved hardware from M/s Cummins shall be provided. Mounting holes for these brackets are available in the H and I bracket assemblies or if required, provision may be done at site as per M/s Cummins recommendations.



Figure No.- 1: Safety Bracket (Encircled above)

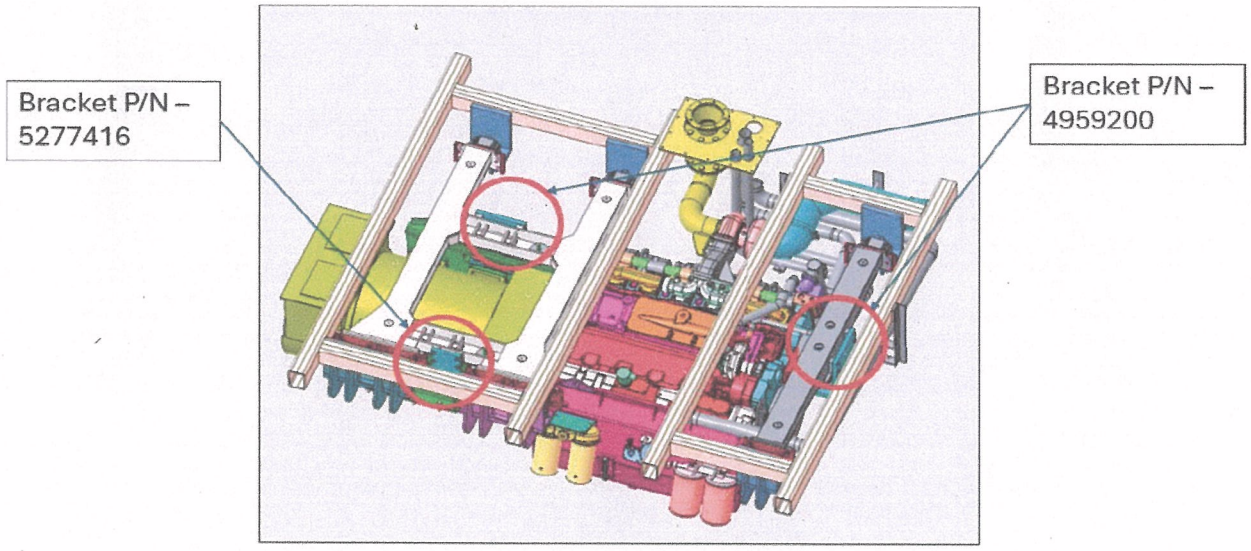


Figure No.-2: Bracket Locations

77

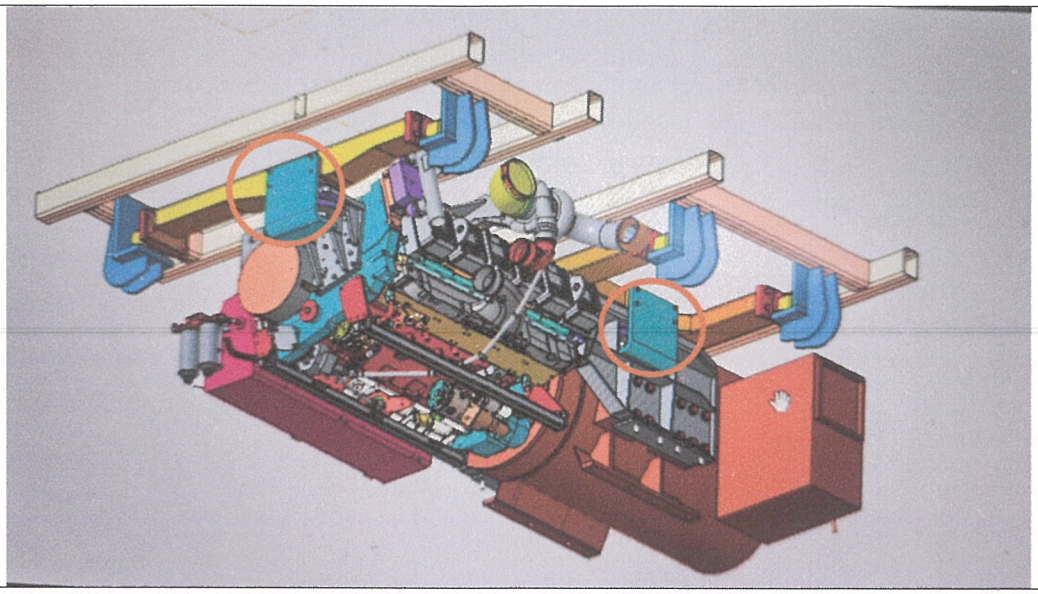


Figure No.-3: Bracket Locations
(Encircled above)

Step-3:- Maintenance Instructions:

CAMTECH has issued the maintenance instructions for On-board type power cars vide IRCAMTECH/GWL/ELECT/2022-23/LHB Manual/1.1 which shall be applicable, however, for under-slung type power cars the maintenance instructions issued by M/s Cummins are enclosed for reference of Zonal Railways for carrying out the special maintenance schedules for under-slung power packs. The same shall be implemented in consultation with M/s Cummins.

Enclosures:

1. **M/s Cummins Drg:**
   - 5275255 – Layout drawing.
   - 4959200 – Support Engine.
   - 5277416 – Support Engine.
2. **Annexure - A (M/s Cummins Maintenance Instructions for under-slung power pack).**
3. **Reference Letters (as referred).**
4. **External Data/Documents :**
   Maintenance Schedules of Diesel Engines as per CAMTECH Maintenance Manual for LHB AC & Non-AC coaches. (IRCAMTECH/GWL/ELECT./2022-23/LHB Manual/1.1)

ANNEXURE-A

76

MAINTENANCE STEPS

1 KEEP DIRT OUT OF THE ENGINE

2 MAINTAIN A LUBRICATING FILM ON ALL BEARING SURFACES

3 REGULATE THE ENGINE'S FUEL

4 CONTROL OPERATING TEMPERATURES

5 GUARD AGAINST CORROSION

Cummins

MAINTENANCE

MAINTENANCE STEPS

6 LET THE ENGINE BREATHE

7 PREVENT OVERSPEEDING

8 KNOW YOUR ENGINE'S CONDITION

9 CORRECT TROUBLES WHILE THEY ARE SIMPLE

10 SCHEDULE AND CONTROL YOUR MAINTENANCE

IMPORTANT INSTRUCTIONS AND RECOMMENDATIONS

1. This Maintenance schedule is applicable for KTA-19 RG3 CPCB I Underslung POWER CAR
2. Recommended Engine Oil CH4 or higher grade of CH4 Oil.
3. Recommended Coolant Premix Fleetguard Compleat EG 50:50 for first fill and top up.
4. Do not intermix different brands or grades of oil or coolant.
5. Refer the Operation and Maintenance Manual supplied with the engine for detail instructions.
6. The Hours / Months whichever comes early should be considered for maintenance interval.

Contact nearest Cummins Authorised Service Office for any clarification.

'A' Check Daily /Round Trip	'B' Check Every 500 Hours / 6 Months	'C' Check Every 1500 Hours / 12 Months	'D' Check Every 6000 Hours / 24 Months	'E' Check Every 15000 Hours / 120 Months
• FUEL-WATER SEPERATOR - DRAIN • LUBRICATING OIL LEVEL CHECK - CHECK • COOLANT LEVEL - CHECK • ALTERNATOR BELT - CHECK • AIR CLEANER PRECLEANER - CHECK • AIR CLEANER RESTRICTION[1] - CHECK THE RED BAND INDICATION • BATTERIES - CHECK • LEAKS - CHECK AND CORRECT • ENGINE LOG BOOK- MAINTAIN • VISUAL CHECK AVM • COACH INTERFACE AVM VISUAL CHECK • CHECK SPACER ON AVM'S BOTH SIDE • SPACER SHOULD BE ALIGNED PARALLEL TO EACH OTHER- CHECK • J BRACKET - TORQUED CHECK	• REPEAT "A" CHECK • LUBRICATING OIL AND FILTERS - CHANGE • LUBRICATING OIL ANALYSIS - CHECK • FUEL FILTER (SPIN-ON TYPE) - CHANGE • COOLANT FILTER - CHANGE • ALTERNATOR BELT - CHECK AND ADJUST IF REQUIRED • SEDIMENTS FROM FUEL TANK - DRAIN • COOLANT CONCENTRATION - CHECK • CRANKCASE BREATHER VENT TUBE - CHECK	• REPEAT "A" AND "B" CHECK • INJECTOR AND VALVE[4] - CHECK • ROCKER COVER GASKET- REPLACE • ENGINE SUPPORT BRACKET, FRONT - CHECK • ENGINE MOUNTS - CHECK • CRANKSHAFT END PLAY - MEASURE • FUEL TANK- CLEAN • RADIATOR - CLEAN EXTERNALLY • RADIATOR HOSES - INSPECT AND REUSE • CRANKCASE BREATHER (EXTERNAL) - CLEAN AND REUSE • AIR CLEANER PRECLEANER - CHANGE • REMOVE J BRACKET FOR INSPECTION AND TORQUING OF AVM.	• REPEAT "A" "B" AND "C" CHECK • FUEL PUMP - CHECK AND CALIBRATE • INJECTOR - CHECK AND CALIBRATE, IF REQUIRED • TURBOCHARGER[2] - CHECK • VIBRATION DAMPER, VISCOUS - CHECK • COOLING SYSTEM[3] - FLUSH • ALTERNATOR DRIVE BELT - CHANGE	• REPEAT "A" "B" "C" AND "D" CHECK • CYLINDER HEAD - CHECK, REPLACE PARTS IF REQUIRED • HYDRAULIC GOVERNOR- CHECK, REPLACE PARTS IF REQUIRED • CONNECTING ROD- CHECK, REPLACE PARTS IF REQUIRED • SILENCER, FLEXIBLE PIPE AND AVM PADS - REPLACE

1. When the Red Band appears on the indicator CHANGE the air filter primary element. The safety element to be replaced at the time of the 3rd replacement of primary element.
2. Check turbocharger, compressor and turbine wheel. Radial and axial play and leakages.
3. Flush in this isntance. The cooling system requires the system to be drained/flushed/filled after every 6000 hours of operation.
4. After an initial adjustment at 1500 hours, it is recommended that the valves and injectors not to be adjusted again prior to injector calibration at the 6000 hours or 24 months interval.
5. E-Check (Over hauling) will perform only on condition basis.

Isolator Location details

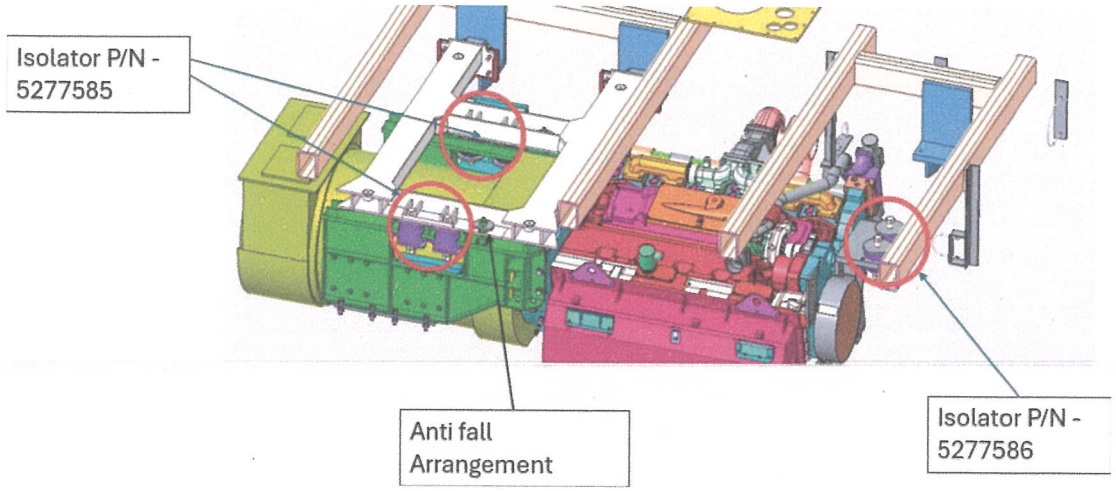
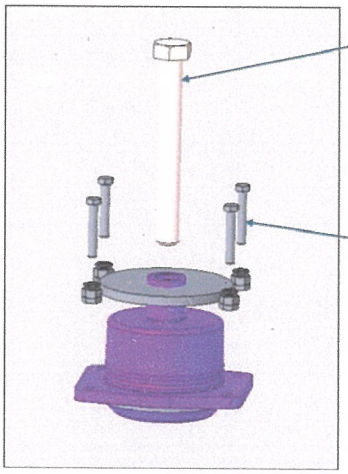
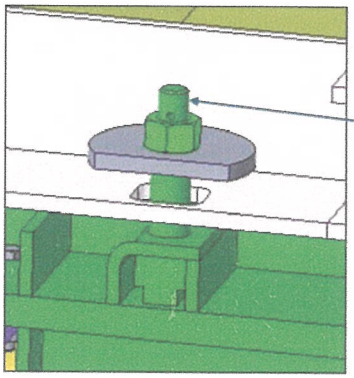


Image - 1

Image - 2

Isolator P/N - 5277585 / 5277586	Anti Fall Arrangement
	

Note:-

1. **If AVM's are in service, it should be replaced after 4 years of operation after consulting Cummins authorities.**
2. **If the AVM's are purchased, considering shelf life it should be used within 4 years.**
3. **AVM's make – Trelleborg make.**

Check Method (Vibration Isolator / AVM's) :

1. **Daily visual check**
2. **Check for physical damage in AVM's**
3. **Check for deformation of rubber element.**
4. **Check for proper torquing of AVM's.**
5. **Standard torque wrench to be used for AVM tightening.**

Note: Marking to be done after applying required torque. If marking is mis aligned re torqing to be done.

Mounting Bracket details

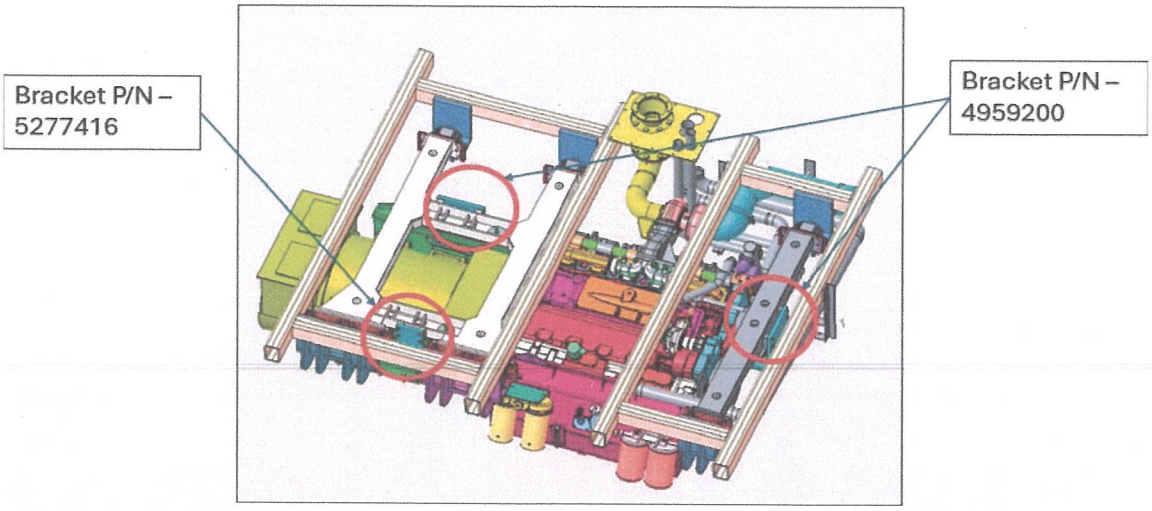
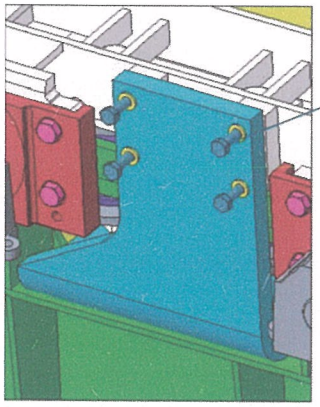
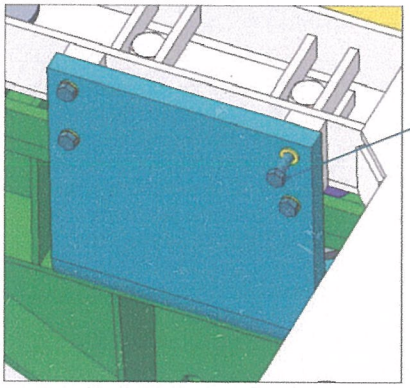


Image – 3

Bracket P/N - 5277416	Bracket P/N - 4959200
	

Note: Mounting arrangement provision is available in H bracket.

Image 4

Anti-fall Arrangement

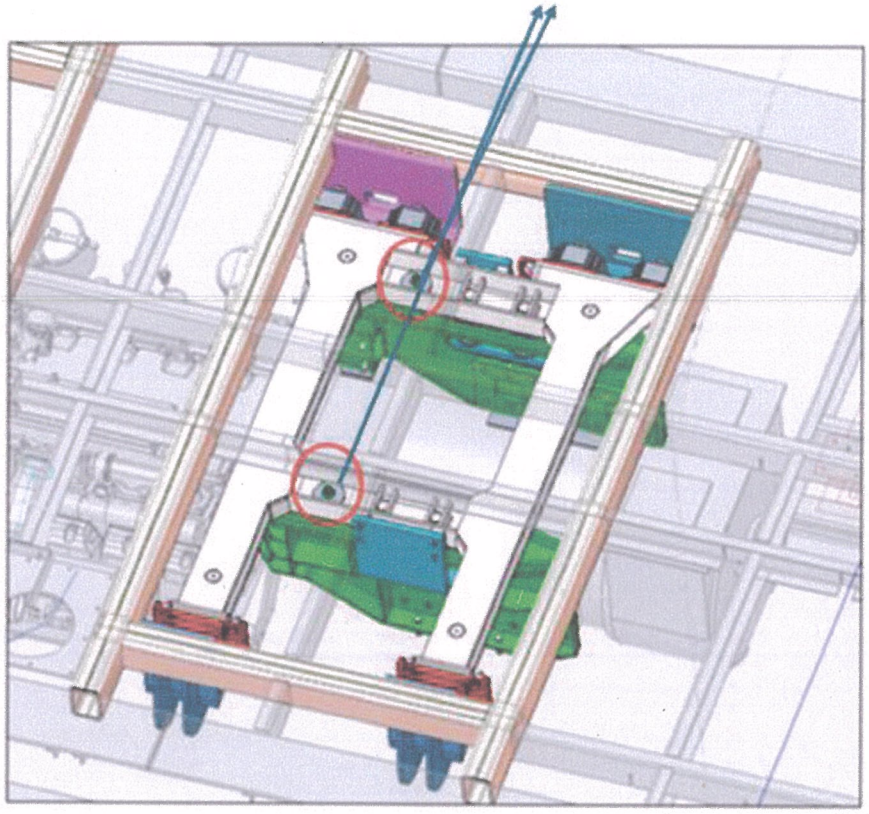


Image 5 –

Drawing of Antifall arrangement bolt :

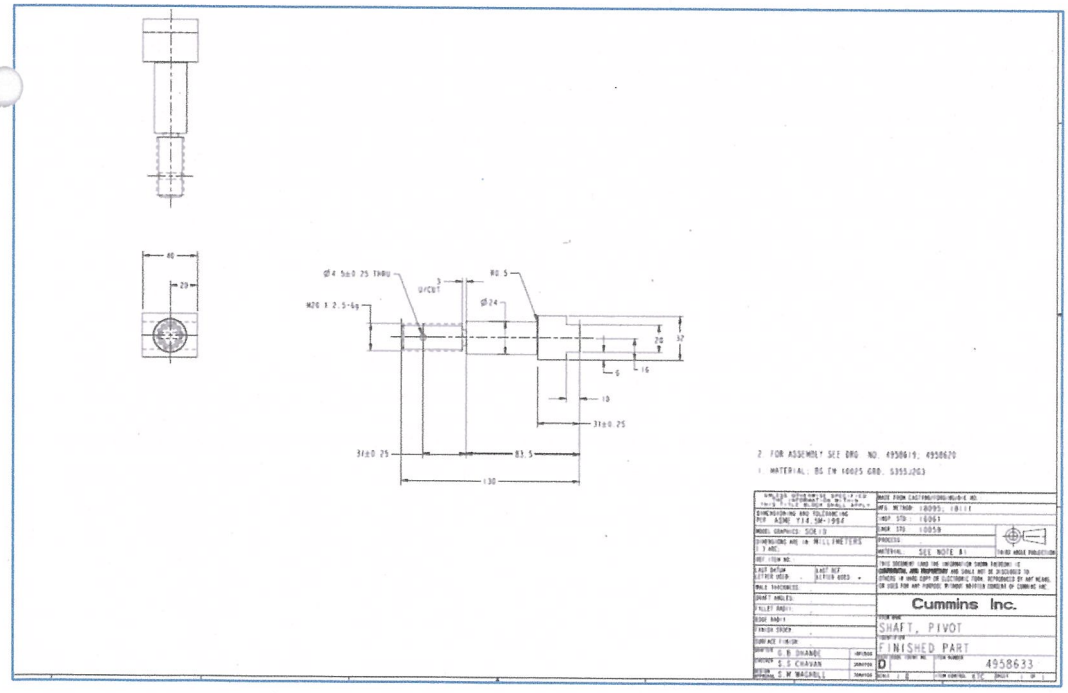
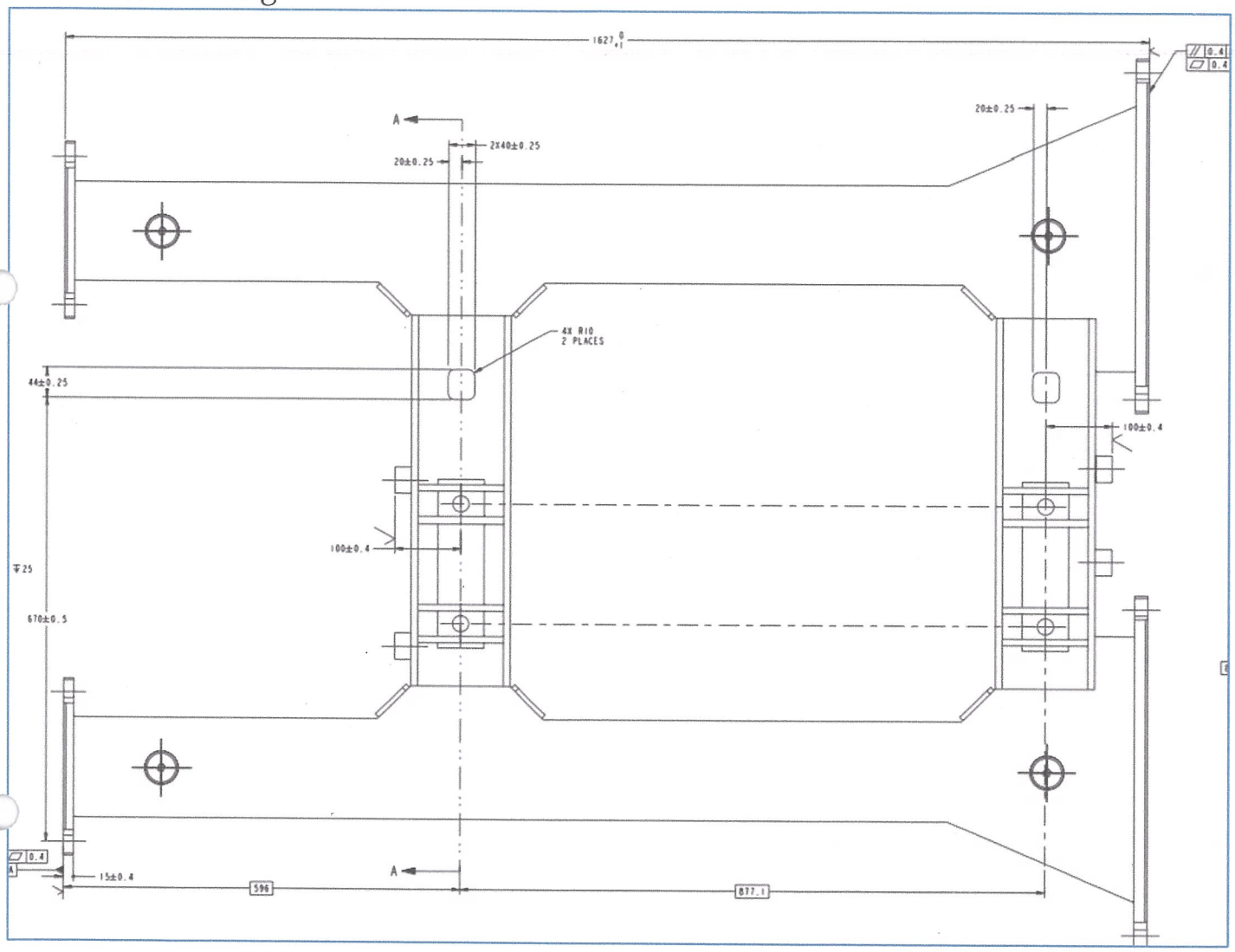


Image 6

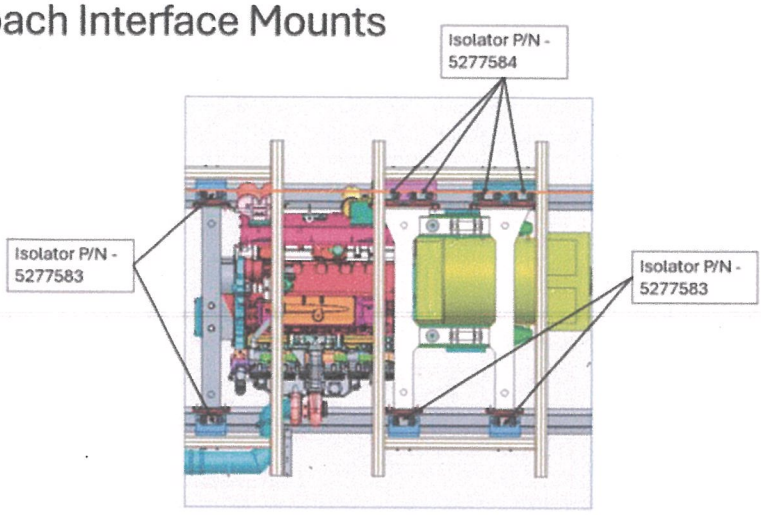
H Bracket Drawing



Mounting Bracket details

Image – 7

Coach Interface Mounts



Isolator P/N -5277584 & 5277583

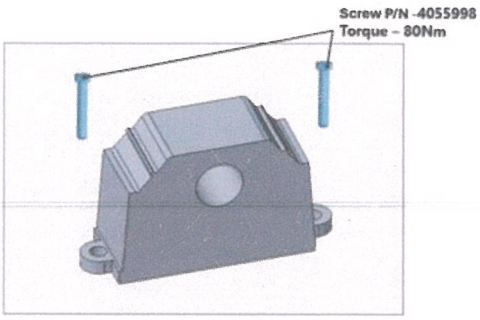
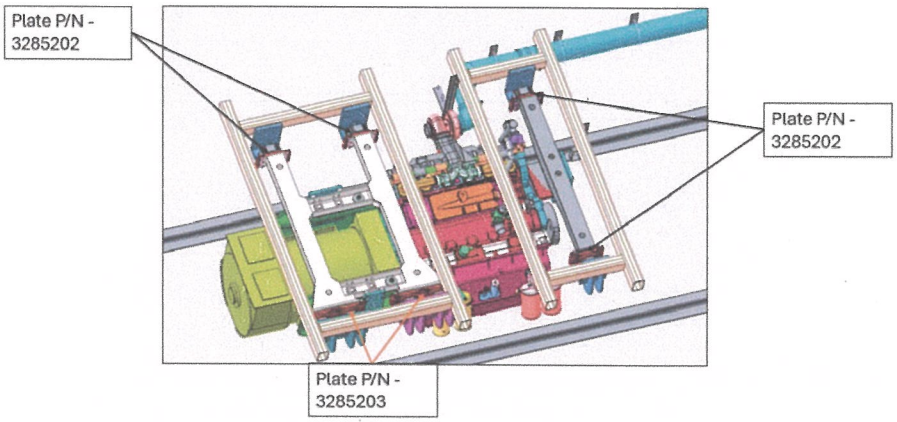


Image – 8 : Spacer Plate mounting



Spacer Mounting Hardware's:

Plate P/N - 3285202

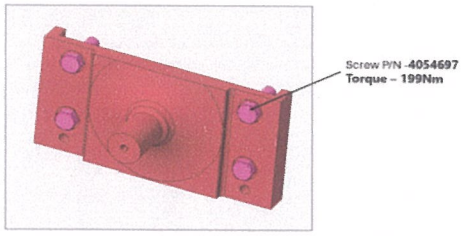


Plate P/N - 3285203

