Comparison-A

Feature/Characteristics	Alco	GM
Type of Engine	4-stroke ,V-type, 16 Cylinder Turbo supercharged Engine	2-stroke ,V-type, 16 Cylinder Turbo supercharged Engine
Engine model	ALCO 251B+ Dis.Vol per cyl-668 CI.	EMD 710G3B Dis.Vol per cyl-710 CI
Horse Power	2600-3300	4000-4500
Tractive Effort (kN)	Maximum 378.5KN in WDG3A Loco	Upto 540 KN
Axle load (Ton)	Upto 20.5	21.42
Loco Speed (KMPH)	120	120-160
Transmission	DC/DC or AC/DC	AC/AC

Comparison-B

Feature/Characteristics	Alco	GM
Fuel feed & Injection System	Separate fuel injection pump ,HP tube & Injector	Compact MUI is used for injection
Cooling water System	Induced draft cooling system having engine driven radiator Fan.	Forced draft cooling having independent controlled radiator fan
Lubricating system & lube oil pump	Single Lube oil pump	4 separate sub systems and 04 lube oil pumps
Air Filtration System	Conventional system	Concept of “centralized Air pressurized compartment”
Brake system	Analog IRAB-1/28LAV-1 brake system is used	CCB having blended Brake feature provide efficient brake

Comparison-C

Feature/Characteristics	Alco	GM
Crank case vacuum arrangement	"Crank case exhaust motor blower" provided.	'Ejector" provided.
Turbo charger	Through out Exhaust gas driven.	Gear driven upto 4th notch and exhaust gas thereafter
Air Compressor	Double stage Air Cooled	Double stage Water cooled
Valve Mechanism Lever	Complex Mechanism	Simple & Improved Design
Engine Block	Conventional Engine Block	Improved Design Crankcase

Comparison-D

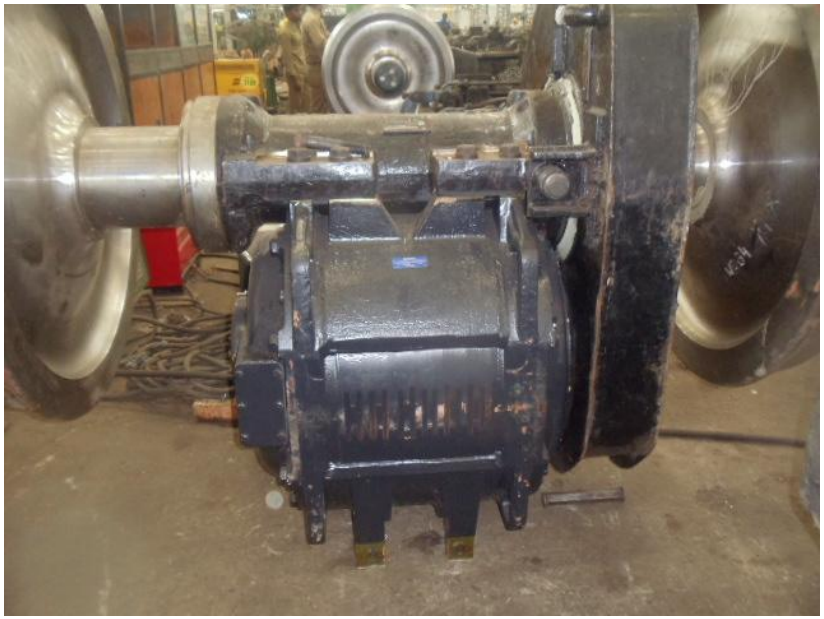
Feature/Characteristics	Alco	GM
Crank shaft & Number of main bearing	Single piece, 09 main Bearing	Two Piece, 10 main bearing
Cylinder liner	Conventional design	Having in-built water jacket with Air port
Connecting Rod	Conventional type ,Separately placed,	Fork and Blade type ,Interlocked
Piston	Fixed Reciprocating Type	Fully Floating Type
Cam shaft and its location	In the middle of Engine block on its both bank	Over deck mounted on both bank of Crank case assembly

Comparison-E

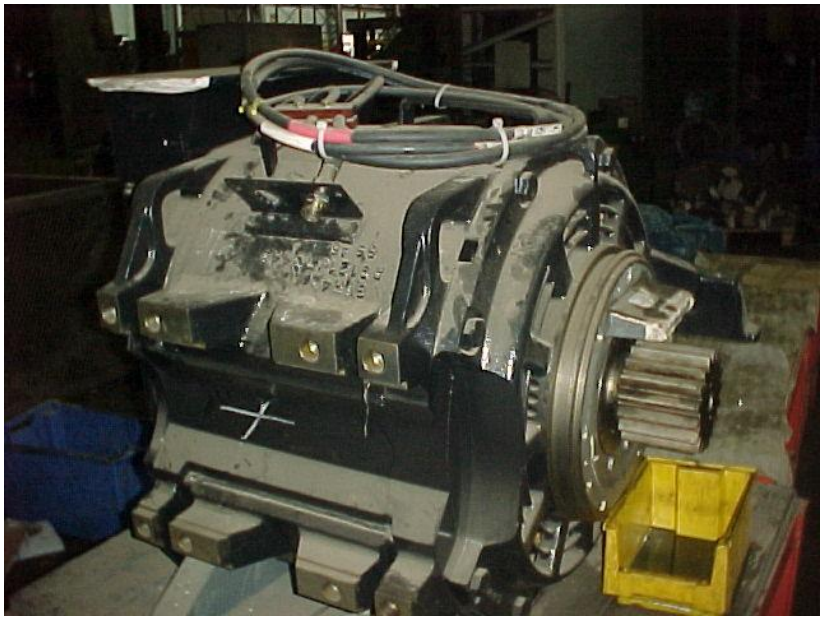
Feature/Characteristics	Alco	GM
Secondary suspension	Rubber spring & lateral damper	Rubber spring & Yaw damper
Axle box Bearing	CRU	Cartridge Taper
Compression Ratio	11.75	16:1
Engine RPM	350-1050	250-954
Engine cranking Arrangement	Aux. Gen Works as Motor and crank Engine	02 Nos Starting motor gets power from battery
Others		

AC/DC -Traction Motor

Alco-Dc Motor

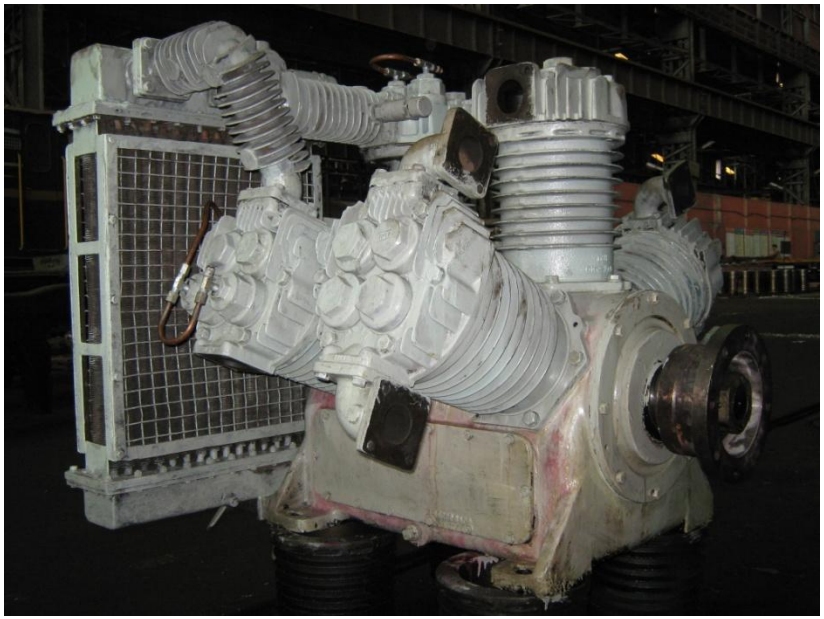


GM- AC motor



Air Compressor

Double stage, Air cooled , Directly Engine driven Air compressor

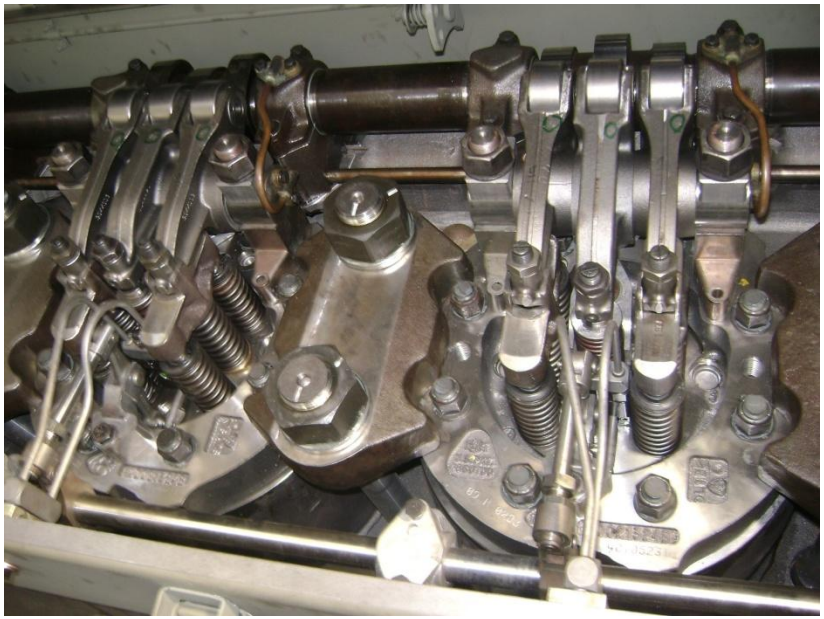


Double stage, water cooled ,Engine driven Air compressor

Cam shaft location

In the middle of Engine block on both bank

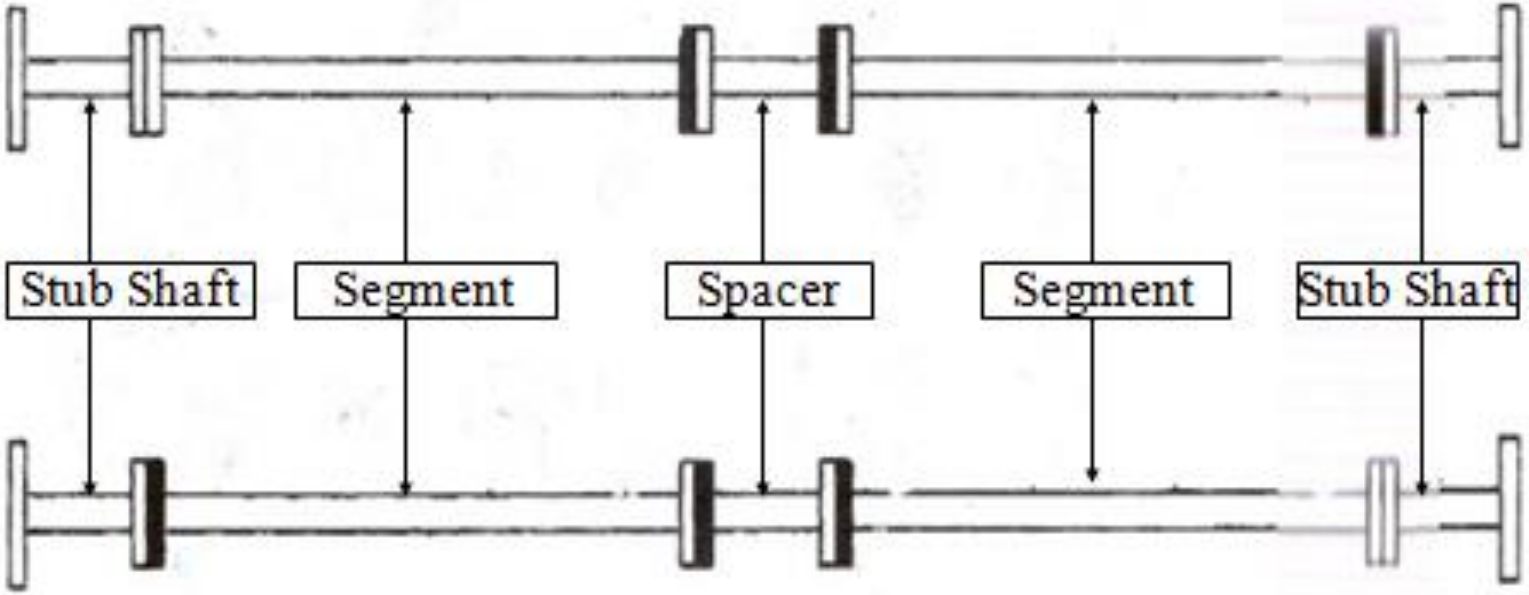
Over deck mounted on both bank and directly drives Rocker arms



Cam shaft(EMD)

Camshaft Assembly Left Bank and Right Bank consists of the following components

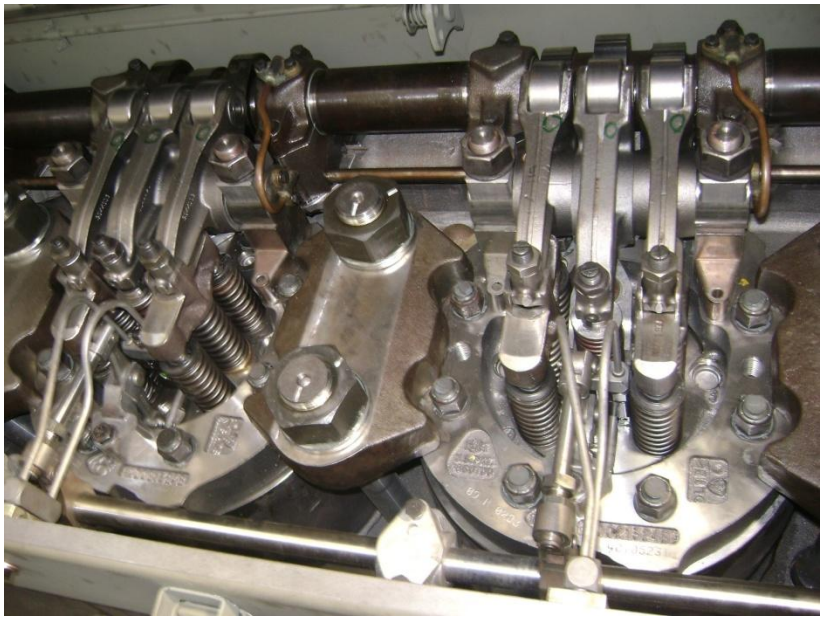
- Camshaft Segment 04 nos.
- Stub Shaft 04 nos.
- Spacer 02 no



Cam shaft location

In the middle of Engine block on both bank

Over deck mounted on both bank and directly drives Rocker arms



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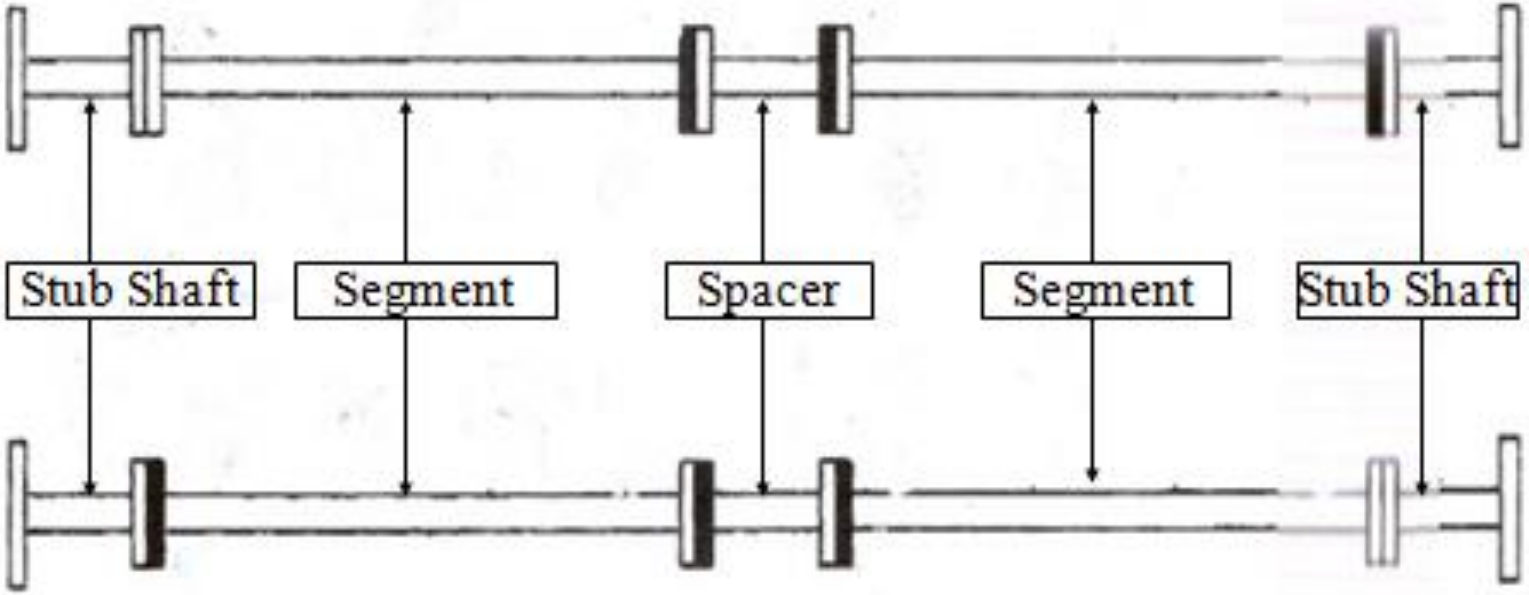


Arrangement for C.C.Exhaust

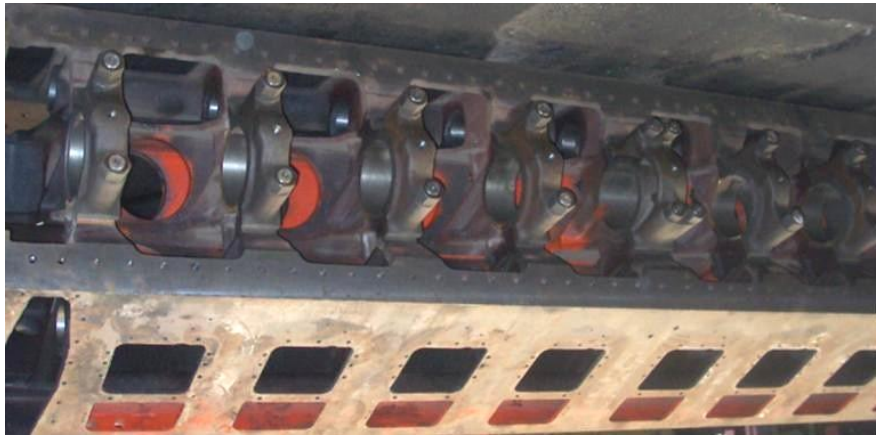
CRANKCASE /Engine Block

Alco- Engine block

GM- crank case assembly

No of Main Brg & its lubrication

Alco- 09 nos Main Bearing,

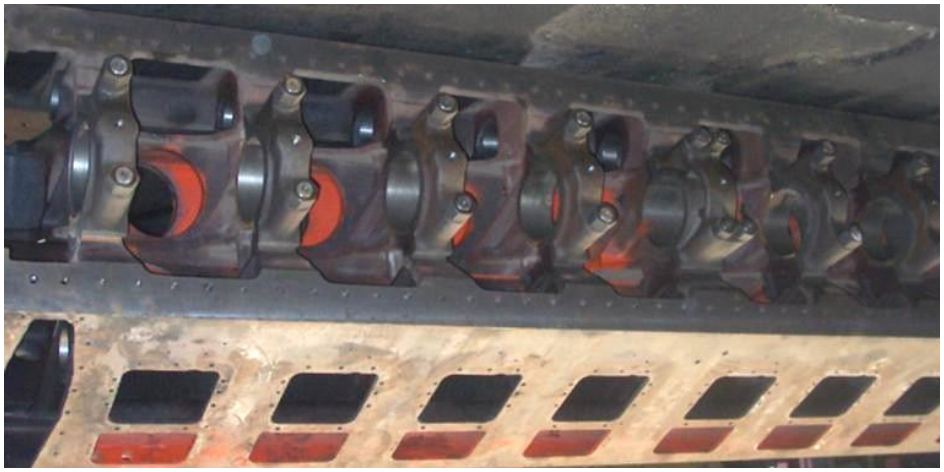


GM- 10 nos Main Bearings

Thrust collar location

- In Alco- Thrust collar are at Bearing No-9
- In GM –Thrust collar are Located at Bearing No-5 & 6

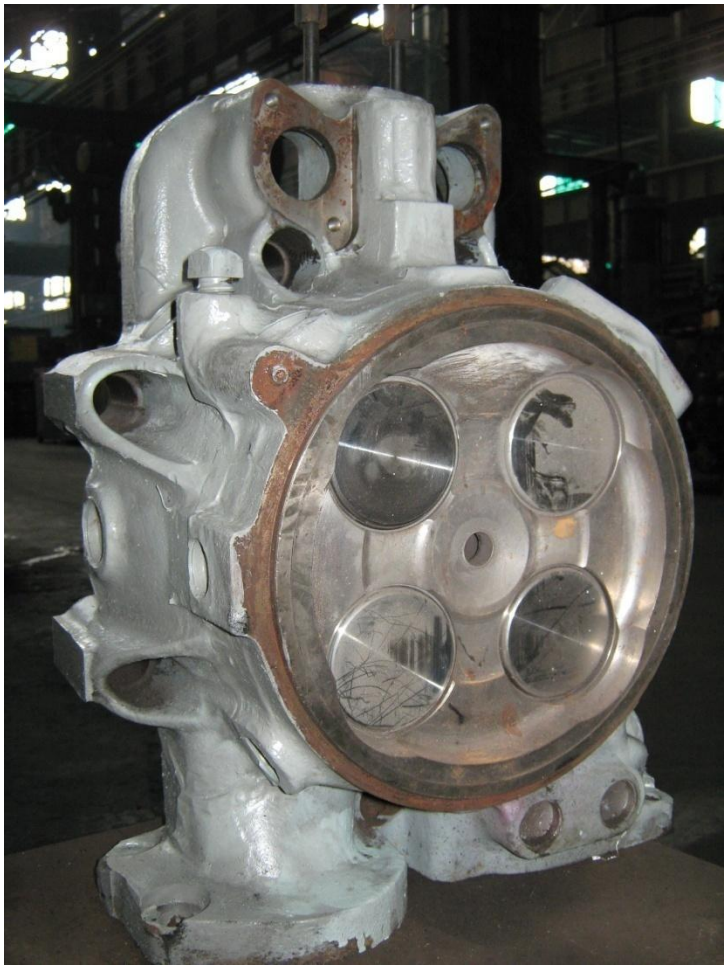
No of Main Brg & its lubrication

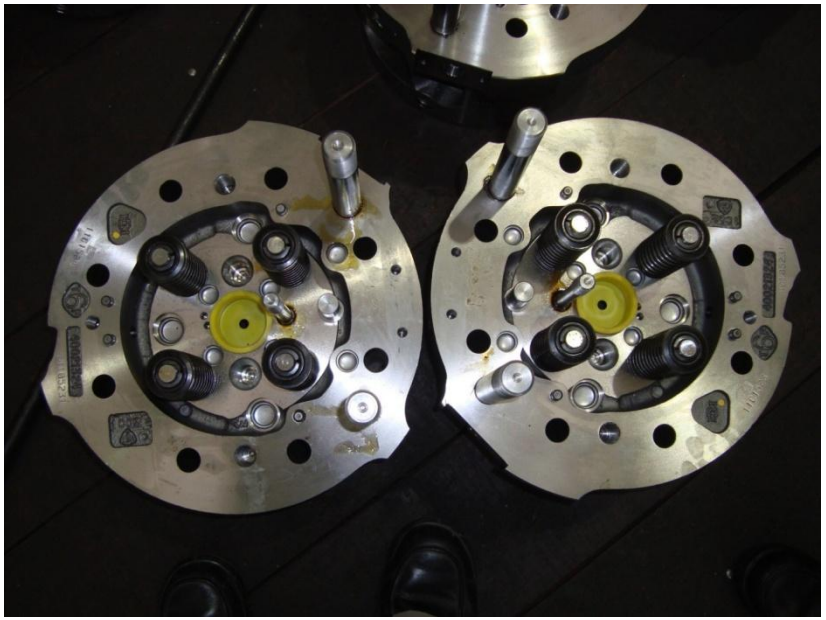


Thrust collar location

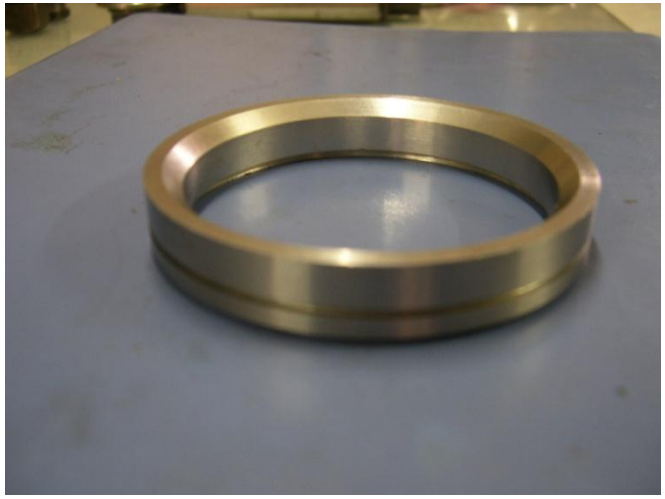
- In Alco- Thrust collar are at Bearing No-9
- In GM –Thrust collar are Located at Bearing No-5 & 6

Cylinder head



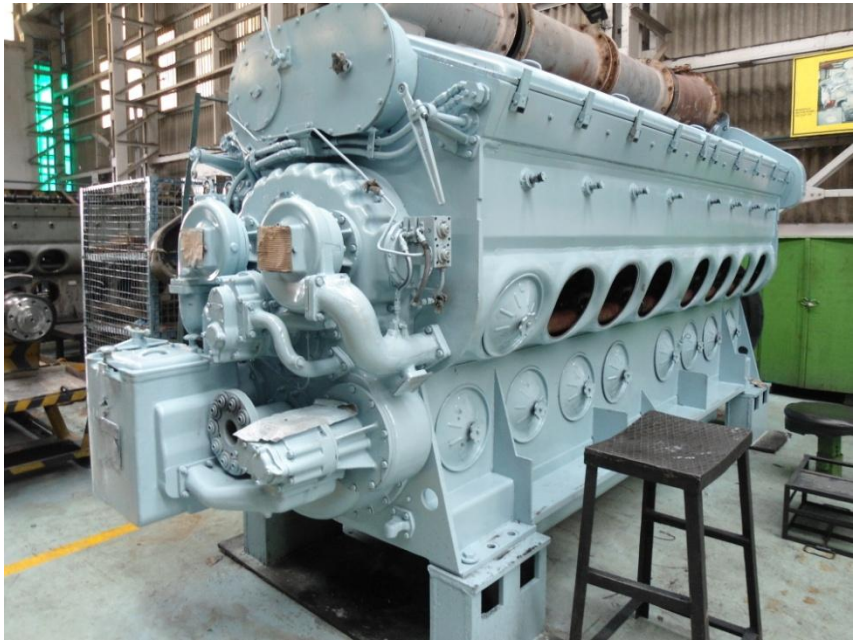


Cylinder head -Insert



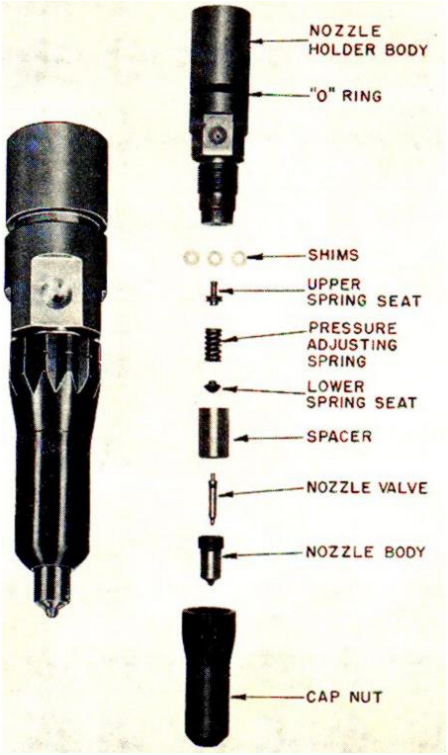
- No insert in cylinder head.

Engine Block

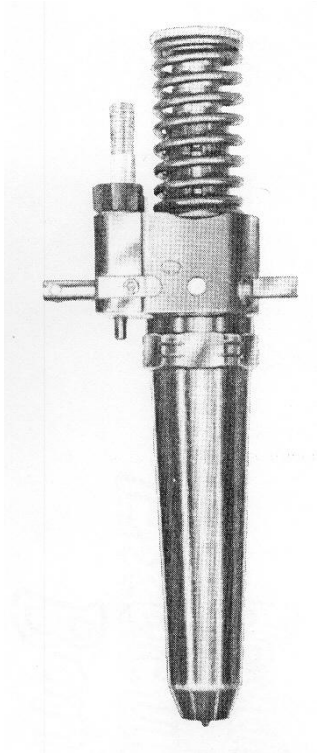


Fuel Injector

Fuel injector



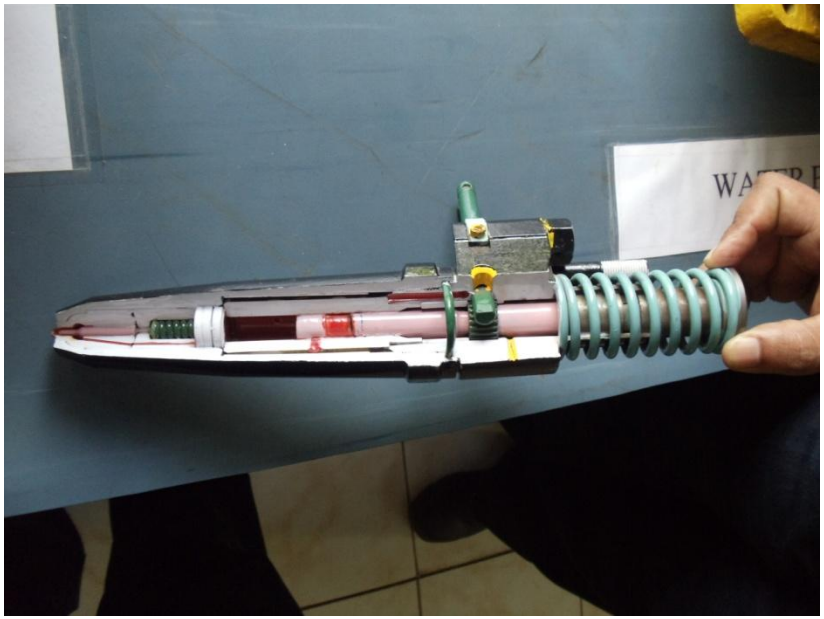
Unit Injector comprises Injector and pump, Internal part are lubricated and cooled by Fuel oil,



Fuel injection Pump

Barrel and plunger type reciprocating type ALCO

Unit injector consists of Bush and plunger type pumping arrangement in GM



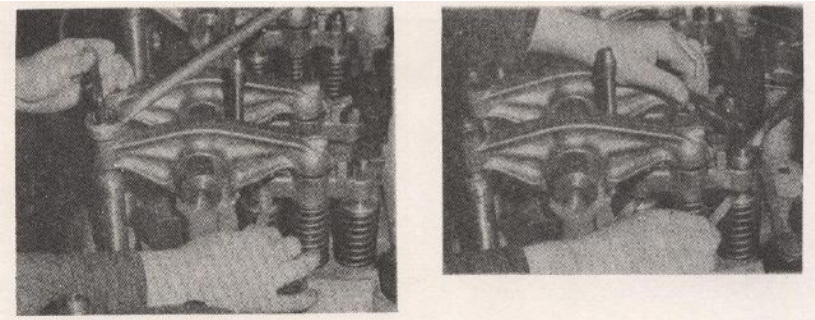
Cylinder liner

Chrome plated liner, water cooled

Laser hardened, In built water jacket , Air port for Air intake

Tappet clearance

Alco-Tappet clearance is to be set



GM- Lash adjuster provided ,No need of Tappet clearance

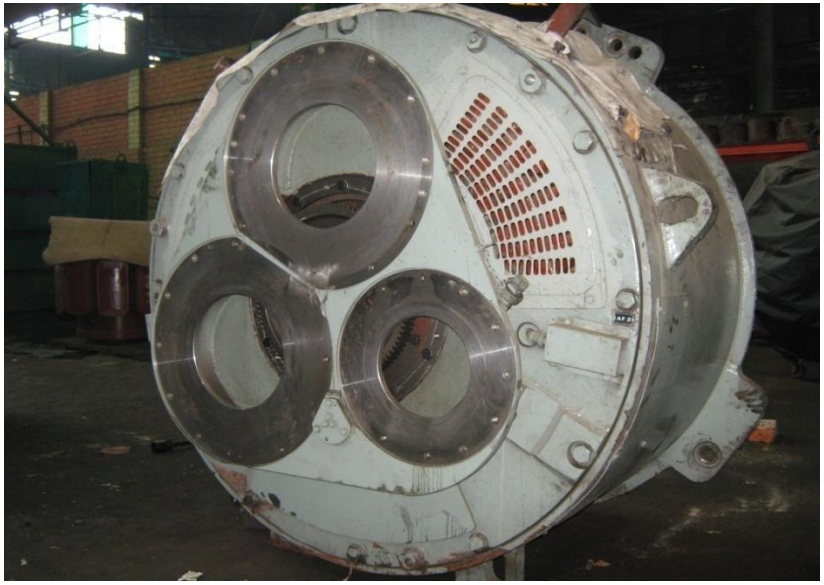
Dynamic brake grid & BLWR

Alco- Dynamic Brake grid in Nose compartment, cooled by Blower

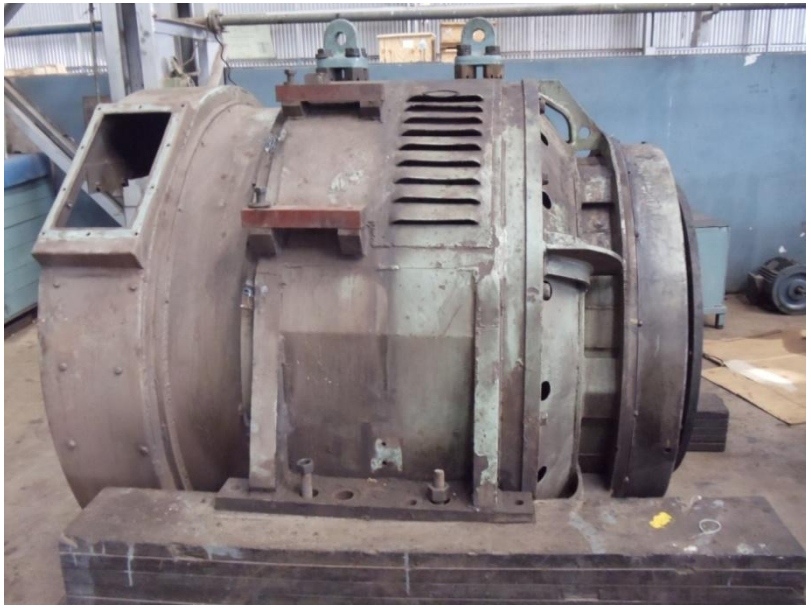
GM-Grid are roof mounted & Located near in TCC compartment, cooled by Two Fans

Tr Alternator

Alco(One-Tr.Alternator)



GM(01-Main Alternator & 01-companion alternator)



Traction Motor Blower

Alco- TM blower- Gear Driven by engine crank shaft

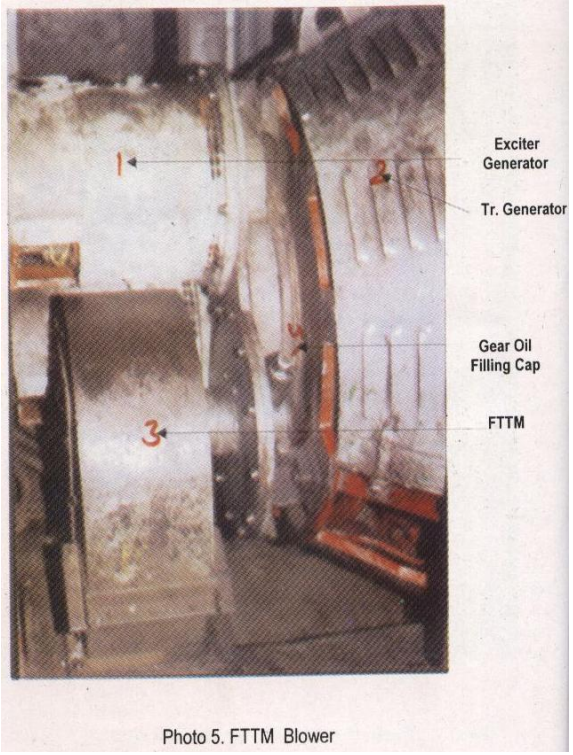


Photo 5. FTTM Blower

GM- Tr. Motor Blower is gear driven by cam shaft

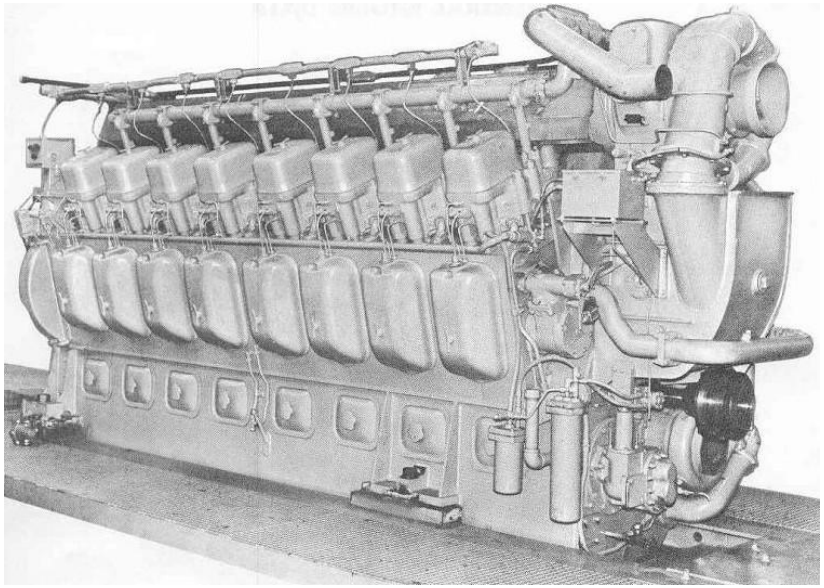
Location of Air Dust bin blower

Alco- Located in under frame down ward.

GM- located in Central compressed air compartment

After cooler & its location

Alco-One After cooler at front end of Engine



GM- Two After cooler mounted on Engine at Rear end

Expansion tank & its location

Alco- Two expansion tank inter connected cap-(155 lt each),1210 Lts

GM-One expansion Tank (1045 Lts)

Load box testing

Alco

- Water load box testing/Grid resistance load box testing

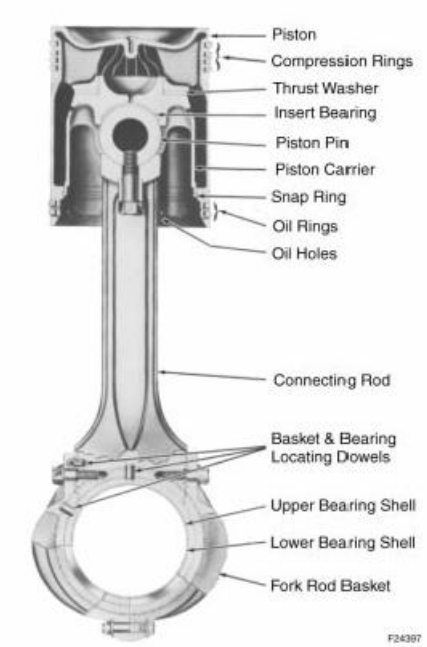
GM

- Self load box testing arrangement

Piston arrangement

Steel cap piston, Cooled by Lube oil- ALCO

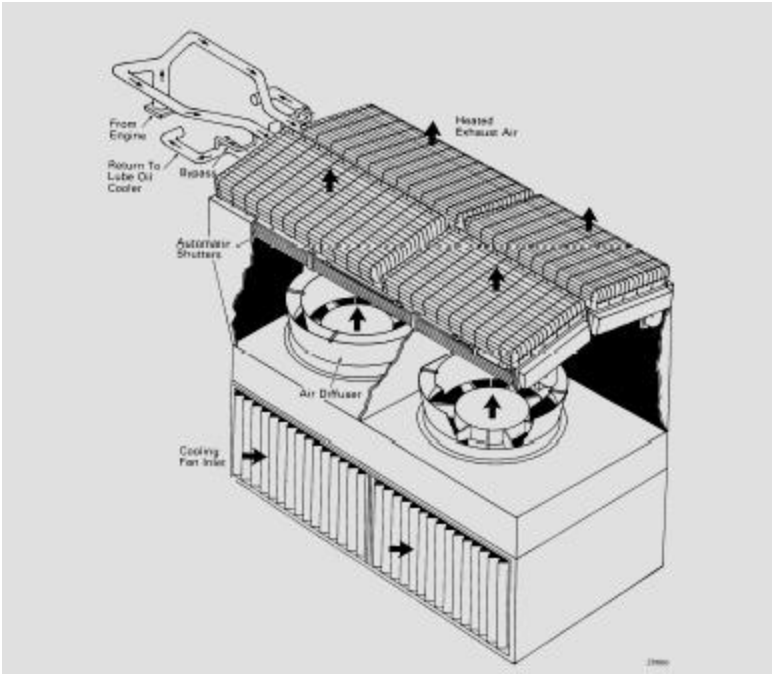
Fully rotating Floating type piston for GM



Radiator core

Vertically mounted on loco frame structure

Roof mounted on frame structure



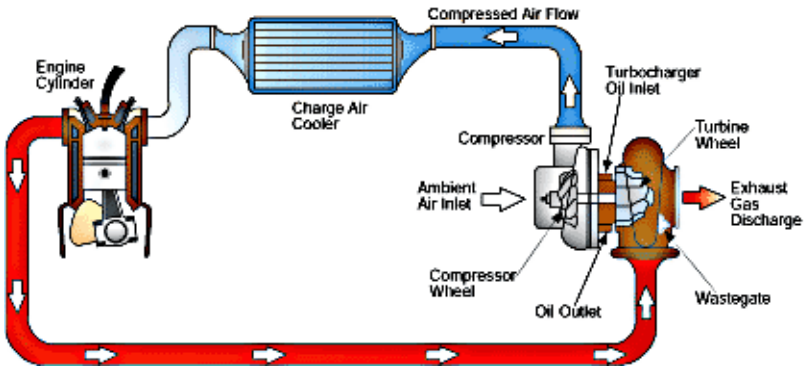
Radiator Fan---

Induced cooling arrangement by one- Radiator Fan, Radiator fan driven by engine

Forced cooling arrangement, by 02 Radiator fan driven by 02 separate AC motor

TSC drive & lubrication

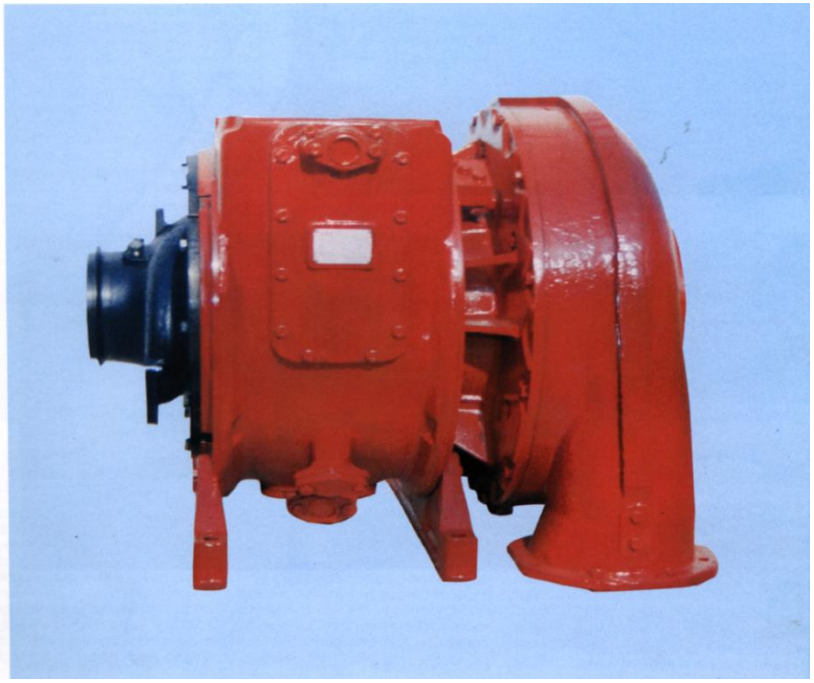
Exhaust gas driven TSC



Initially Gear driven by Engine and thereafter driven by Exhaust gases

TSC

Alco

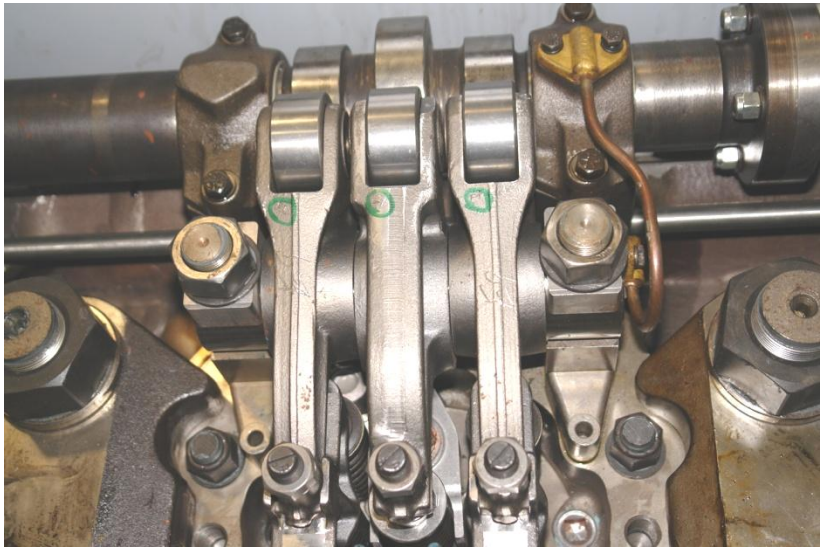


EMD TSC

Rocker arm assembly

Valve lever mechanism support
Push rod to drive Rocker arm-Alco

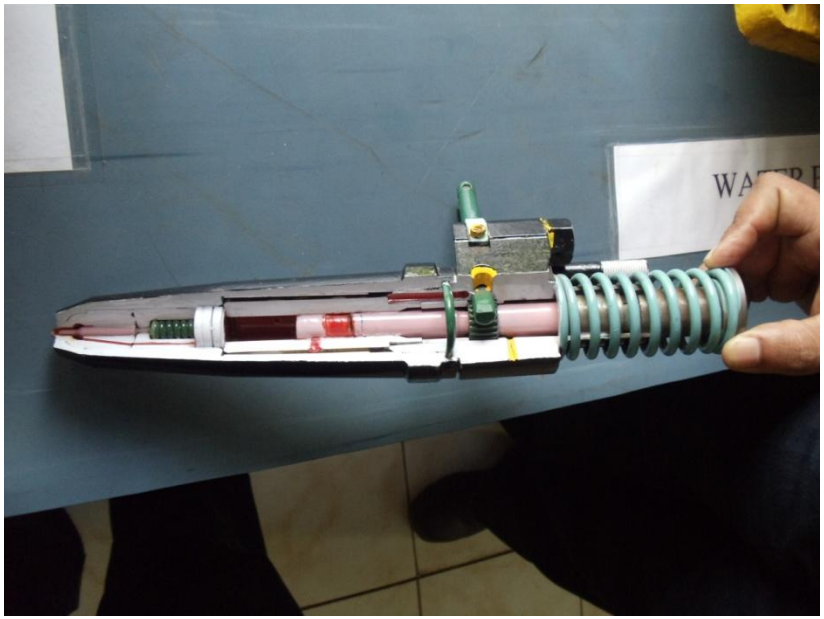
No concept of Push Rod, Rocker arm directly driven by Cam Shaft -GM



Fuel Injection Pump/Unit Injector

Valve lever mechanism directly Drive FIP -ALCO

No High pressure tube, Rocker arm directly driven by Cam Shaft -GM



THANKING YOU