



ART & ARME



ART

ACCIDENT RELIEF TRAIN

ARME

ACCIDENT RELIEF

MEDICAL EQUIPMENT(VAN)



Self Propelled Variants

SPART

Self Propelled Accident Relief Train

SPARMV

Self Propelled Accident Relief Medical van

OBJECTIVE

- 1) Save life and alleviate suffering
- 2) Protect property including mails
- 3) Provide succor and help to other passenger at the site of accident
- 4) Ascertain cause of accident
- 5) Restore through line of communication

Provisions of Rule Books & manuals in ART

- 1) General & Subsidiary Rules book
- 2) Accident Manual
- 3) Block working manual
- 4) Operating Manual
- 5) Rules of working crane
- 6) Working Time Table
- 7) Disaster management action Plan of the Division



ART

CLASSES & COMPOSITION

'A' Class

- 1st & 2nd Vehicle 140 ton crane with match truck.
- 3rd Vehicle Crane Tool & Equipment Van
- 4th Tool & Equipment Van for OHE & Engineering
- 5th BFR with Rails
- 6th Staff Car
- 7th General Loco C&W Stores & Tool van
- 8th HRE/Generator & S&T Equipment

'B' Class

'B' Class ART consists of 3rd to 8th vehicles as above without the Crane & Match truck

'C' Class

'C' Class ART could be of following Types

- Single Tool Van (RT) or a Covered Wagon
Equipped with Tools
- Self Propelled Vans
- Rail cum Road Vehicle

ACCIDENT RELIEF TRAIN

- If Only HRE is ordered without Breakdown Crane then the composition Shall be
 - 1st Vehicle Staff Car
 - 2nd Vehicle General Loco & C&W Stores
 - 3rd MFD/Generator & S&T Equipment
- If Only Crane is ordered the composition Shall be
 - 1st & 2nd Vehicle 140 ton crane with match truck.
 - 3rd Vehicle Crane Tool & Equipment Van
 - 4th Tool & Equipment Van for OHE & Engineering
 - 5th BFR with Rails



ARME

CLASSIFICATION

SCALE-I

Equipments are stored in special Medical Coaches called 'ARMV'

ARMV consists of Auxiliary Van & Medical Relief Van



SCALE-II

Equipments are stored in Boxes
in Special Rooms on the station
platform

ART / ARMV

- All coaches & wagons fit for high speed
- All stock to be converted to air brake
- Coaches with 18 – 20 years service
- Coaches beyond 30 years to be condemned
- Coaches to be given POH once in 3 ½ years

Code of Accident Siren/Hooter (N.F RLY)

Nos. Of Hooter	Duration	Type of Accident/ Train Involved	Main line blocked/ not blocked	To Move ART/ ARME
3	<p>1ST Blast : Duration of 30 sec. followed by a pause of 10 sec.</p> <p>Subsequent Blast : Duration of Blast 15 sec. followed by a pause of 5 sec. Between each Blast</p>	<p>Accident do not involve loss of human life or injuries</p>	<p>Derailment, Main line not blocked</p>	<p>ART</p>
4	<p>1ST Blast : Duration of 30 sec. followed by a pause of 10 sec.</p> <p>Subsequent Blast : Duration of Blast 15 sec. followed by a pause of 5 sec. between each blast</p>	<p>Accident do not involve loss of human life or injuries</p>	<p>Main line blocked</p>	<p>ART</p>
6	<p>1ST Blast : Duration of 30 sec. followed by a pause of 10 sec.</p> <p>Subsequent Blast : Duration of Blast 15 sec. followed by a pause of 6 sec. between each blast</p>	<p>Serious Accident involving loss of human life or injuries requiring medical assistance</p>	<p>Main line blocked/ not blocked</p>	<p>First ARME Then ART</p>

Timely despatch of ARMV/ART/Engineering materials

Type of Relief Train	Type of Exit (Single/Double)	Target Time for Turning Out During Day / During night	
ART	Irrespective	During day: 30 min. after sounding of hooters During night: 45 min. after sounding of hooters	
ARME	Double Exit	15 min. after sounding of hooters	Both the cases are Irrespective of Day/Night
	Single Exit	25 min. after sounding of hooters	

- Sr. DOM/ Sr. DME will ensure availability of Crew for ARMV/ART to leave for accident site in time.

LIST OF ART EQUIPMENT

1. Generators & Electrical Equipment
2. Illumination other than electrical
3. Oxy-cutting Equipment
4. Compressor And Pneumatic Tools
5. Hydraulic re-railing Equipment (HRE)
6. Jacks (Screw & Hydraulic)
7. Wire Rope & Winches
8. Chains, Slings & Crane Accessories for Break Down.
9. Fitters Tools-Axes, Vice Crow Bars, Tommy bars, Chisel, file, hammer, Shovels, Punch, Pliers, Spanners, Tongs
10. Measuring Instruments
11. Wooden Packing
12. Oils & Grease

LIST OF ART EQUIPMENT

12. C&W Spare parts
13. General Hardwares
14. Personal Protective Equipment for safety & Weather Conditions
15. Site Camp Equipment – tents, chairs, folding table
16. Kitchen Equipment
17. Engineering Tools-Augers, beaters, cane baskets, tommybars, drill, fish plate, hand hacksaw track materials

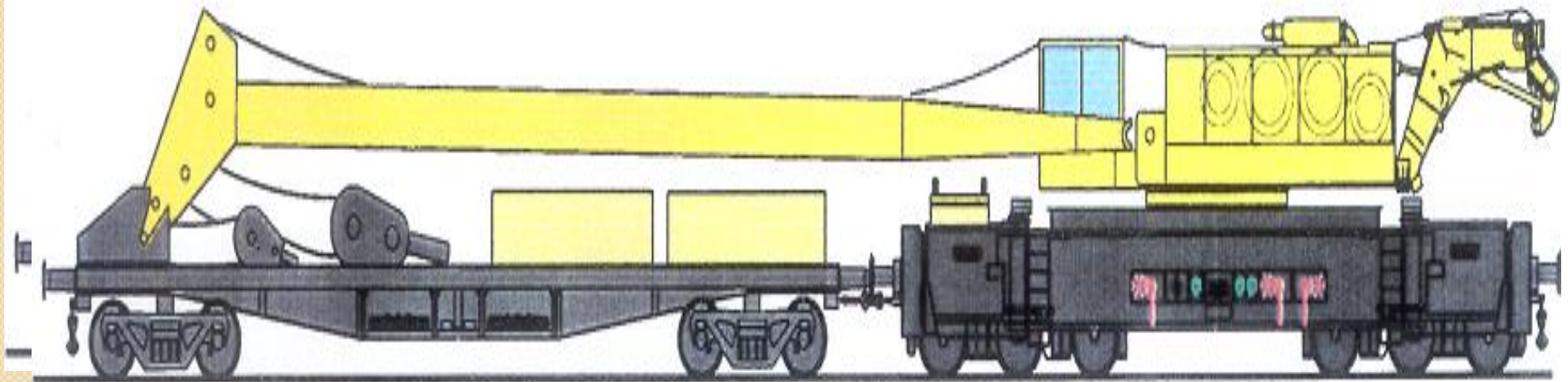
LIST OF ART EQUIPMENT

18. Medical Equipment- first Aid Boxes, Stretcher
19. Signal & Telecom Equipment- Field Telephone, telescopic pole equipment, Magnetic telephone, Dry cells, Loudspeakers, Microphone, Satellite phone ,Cell phone
20. Recording & Record Keeping-Digital Camera still & video, Night Vision Camera, Lap Top, Registers
21. Barrier Tapes
22. Water Tank
23. Food Items

140 TON CRANE

Boom

Super Structure



Match truck

Under Carriage

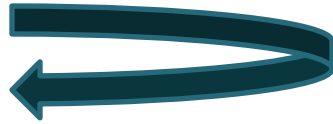
Basic Crane Motions

- Hoisting



Lifting/lowering

- Slewing



JIB Rotation 0-360
degree

- Derricking



Jib in - out

- Travelling



Front - back

ADVANTAGES OF THE 140 T CRANE

- Capacity to lift a loaded BOXN wagon on the same track and slew it through 30 degrees on either side of the track centerline.
- Maximum permissible speed of 100 km/h.
- Provision of safe load moment indicator and safety cut-off.
- All motions hydraulically controlled through pumps, motors and cylinders.

Safety Precautions

- 140 T B.D. Crane
 - Proper Propping base preparation using
 - Suitable propping pad, sand bags
 - Observing nature of soil(dry/wet, loose/hard)
 - Leveling and clearance of prop.
 - Use of Rail Clamp, esp. in working on Bridges.
 - Use of proper Counterweight/lifting tackle.
 - After lifting, height of load to be kept minimum from ground.
 - Avoiding pendulum motions of lifting load.
 - Horn regularly used.
 - Prior selection of grounding place.
 - Slewing to be done slowly.

A Part of ART/NBQ



ART EQUIPMENTS



Inside Tool Van



HRE & HRD

- Hydraulic Re-railing Equipment (HRE)
 - Special purpose equipments for restoration Operation
 - For re-railing or toppling the stock.
 - Available at ART.
-
- Hydraulic Rescue Device (HRD)
 - Extricate and rescue the trapped passengers inside the mangled coaches
 - Available at ARMV.

Types of HRE

➤ MFD

➤ LUKASH

➤ BEMCO

MFD Operation



HRE equipment available and usage

Sr. No.	Equipment Nomenclature	Usage
1	Power Pack Diesel Eng. Driven with axial piston pump/Radial piston pump.	
2	Roller carriage with/without turn table	For Shifting the rolling stock for rerailment.
3	Re-Railing Bridge(4.5 m)	Used with Roller carriage for major shifting
4	Re-Railing Bridge(3.3m)	Used with Roller carriage for medium shifting
5	Re-Railing Bridge(2.2 m)	Used with Roller carriage for medium

HRE equipment available and usage

Sr. No.	Equipment Nomenclature	Usage
6	Re-Railing Bridge(1.2 m)	Used with Roller carriage for minor shifting
7	Telescopic Jack. Capacity-120/60T H.C.	Loaded Vehicle/ Locomotive Lifting to major lifting
8	Telescopic Jack. Capacity-120/60T L.C.	Loaded Vehicle/ Locomotive Lifting to minor lifting
9	Telescopic Jack. Capacity-60/30T H.C.	Empty wagon/coach, Major Lifting
10	Telescopic Jack. Capacity-60/30T L.C.	Empty wagon/coach, Minor Lifting

HRE equipment available and usage

Sr. No.	Equipment Nomenclature	Usage
11	Telescopic Jack. Capacity-12/6T	Shifting the rolling stock over roller carriage.
12	Haulage and Rescue device with pulling equipment-25T	For pulling purpose of rolling stock
13	Multistage Jack Capacity-60T	Where the gap of accident rolling stock is low which is unfit for placing of L.C. jacks
14	Step Jack-35 T	For grounding of empty rolling stock
15	Fish plate for coupling of Re-railing bridge.	Extension of Girder.

Hydraulic Jacks & Power Pack



Bridges



HRE Control Table



Re-railing Operation By MFD (Maschinen Fabrik DeutschLand)



Advantages of HRE

- Quick response in comparison to 140 tones Diesel Crane.
- No need to slewing of the OHE wires.
- Easily transportable (Manually or by push rail trolley).
- Easily accessible to places where 140 T Diesel Crane is not able to work (eg. Car sheds, loco sheds, workshops, tunnel etc.).
- Easy to operate in comparison to 140 T D/crane.

Disadvantages of HRE

- If the rolling stock/locomotives are in capsized or grounded condition, re-railing is a tedious job with HRE.
- In case of major derailments involving several rolling stock 140 T Crane is preferable.

Safety Precautions With HRE:

- Direct jack/body contact to be avoided.
Wooden packing required.
- Proper leveling of bridge.
- Lifting held at the extreme lift.
- Proper handling and fitment.
- Jack not to be kept un-necessarily or for prolonged period under load.

Safety During Operation

- Operating pressure has to be controlled and any leakage has to be prevented
- Defective device should not be used
- Air which may be entrapped within the system has to be removed as far as possible\
- Operating personnel is not allowed to stay under lifted loads unless those are secured by additional supports
- Moreover safety rules should be maintained for preventing accidents

ART EQUIPMENT

- **emergency inflatable lighting tower**
- 54cm * 33cm * 55cm when folded.
- Overall height 4.5 meters when inflated.
- 400W Metal Halide lamp .
- Lights up 10000 sq feet area.
- Set up time 3 minutes
- Weight < 45 Kg.



Gas Cutting Equipments



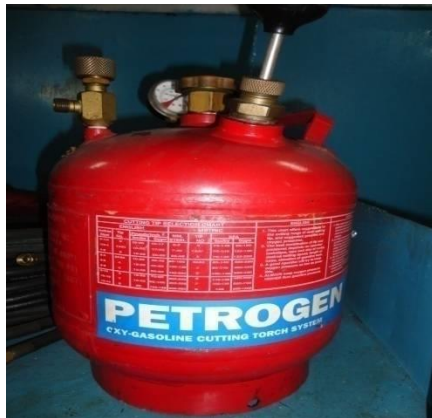
Oxygen & Acetylene Cylinder



ART EQUIPMENT

- **under water cutting equipment-petrogen**

oxy-gasoline cutting torches for large section steel structures & for under water cutting. works on oxygen & petrol/diesel .no acetylene required.



Self contained breathing apparatus

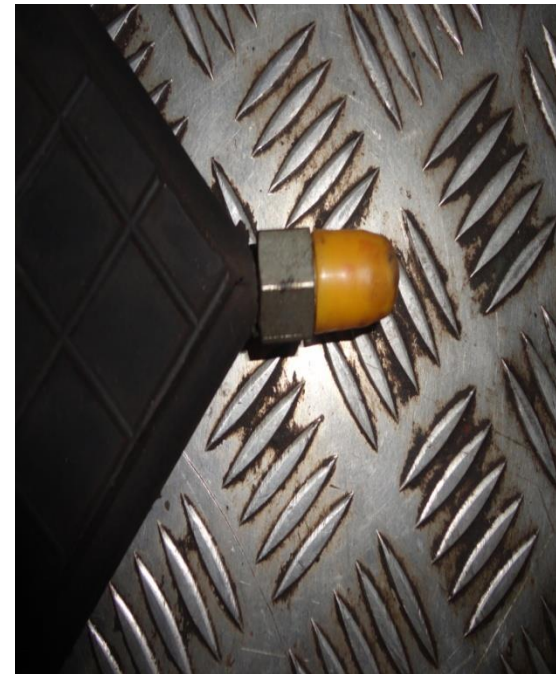


Portable Electrically Operated Cutting & Boring Tools



Inflatable Air Bags.

Each bag should be individually inflatable with no stress points. should be stackable & inter-lockable with one other . factor of safety 4.



Diesel Engine operated Air Compressor with Reservoir



SELF POWERED CHAIN SAW

for cutting wood, tree & branches
(Light Weight Only 10 Kg)



SELF POWERED DIAMOND CHAIN SAW

for wet cutting of concrete up to a depth of 30 cm.



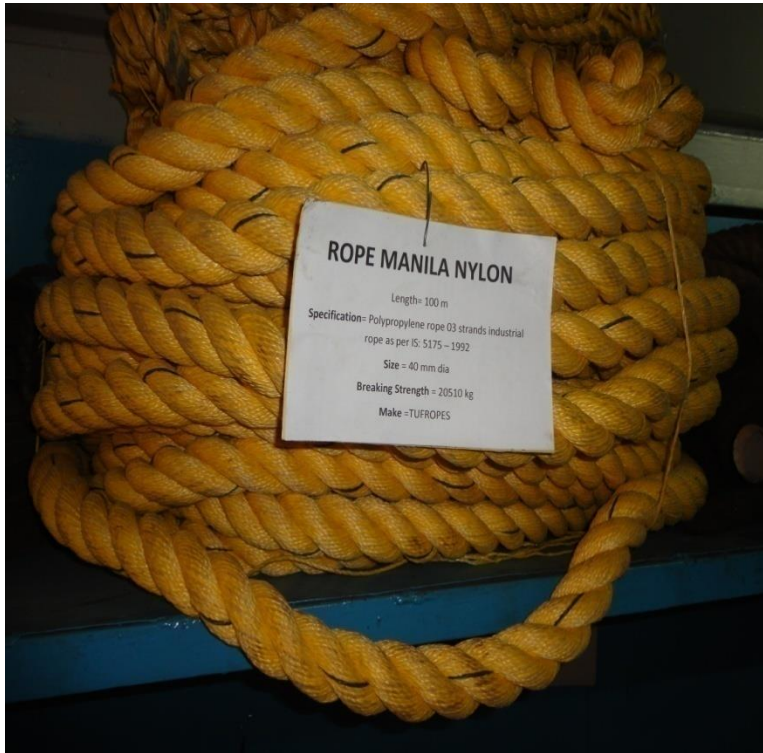
ART EQUIPMENT

- WATER PROOF GARDEN UMBRELLA FOR GENERATOR & HRE POWER PACK
- ADEQUATE PACKING FOR CRANES
- FACILITY FOR UNLOADING EQUIPMENT
- TROLLEY FOR MOVEMENT OF MATERIAL TO SITE
- WRIST BANDS
- RESCUE PLATFORM FOR 140 TON CRAN

LIGHT WEIGHT FOLDABLE LADDERS AT LEAST 12 FEET IN LENGTH



ROPES & NETS



ARMV EQUIPMENT

- LIGHTWEIGHT SYNTHETIC PREFABRICATED WATER PROOF TENTS
- LUMINOUS JACKETS



FIRST AID BOX



Stretcher



- PORTABLE FIRE EXTINGUISHERS
- 25 READY MADE SPLINTS & SLINGS
- PORTABLE GEN. SET
- BATTERY OPERATED HEADLIGHT



Portable Generator (Petrol/diesel)



HYDRAULIC RESCUE DEVICES

- Spreader
- Cutter
- Can do only cold cutting
- Carbide saws & electrically operated equipment

Abrasive Cutting



Diamond Chain Saw For Concrete Cutting



HRD- Hydraulic COLD Cutter



Cold Cutter



Making Holes using punch



HRD- Hydraulic Spreader



HRD- Hydraulic Spreader



Spreader Operation



Spreader Operation





THANK YOU