

Recommendation of Committee on 'Policy on Procurement of Spares of Track Machines'

Authority: Railway Board Letter No.2016/Track/III/TK/4 dated 29.06.2016

1. Railway Board vide referred letter has constituted a committee of seven SAG officers for framing Policy on Procurement of spares for Track Machines. The members of the committee are:

(i)	ED/TM/RDSO	-	Convener
(ii)	CE/TMC/NCR	-	Member
(iii)	CE/TM/SCR	-	Member
(iv)	CE/TMC/NR	-	Member
(v)	CE/TMC/CR	-	Member
(vi)	CE/TMC/ER	-	Member
(vii)	Sr. Professor, IRICEN	-	Member

2. Terms of reference:

- (a) To study the existing system of procurement of spares for Track Machines.
- (b) To suggest the improvement over the existing system of sourcing spares for track machines keeping in view of life cycle cost of track machines and to frame a uniform policy on procurement procedure of spares for track machines to be adopted on IR.

3. Discussion:

The safety of running trains is paramount on a railway system and maintaining the track to safe standards is vital for running of trains. Indian Railways has shifted from manual system of track maintenance to mechanized system of maintenance. Track machines are utilized for regular track maintenance, periodic track maintenance as well as for track renewals.

It is, therefore, very important to keep the track machines in good health by a developing a robust maintenance system. Indian Railways Track Machine Manual prescribes the various maintenance schedules for different types of machines. The maintenance of machines is carried out by Zonal Railways and by centralized POH workshops.

Most of the machines working on IR are imported as of now. The design of a track machine is a result of lot of R&D and is quite complicated. During several years of experience, Railways have been able to identify some components which are

purchased by OEM from a recognized manufacturer (branded) and can be obtained from the authorized dealer of the brand at a competitive cost. Some other parts primarily mechanical in nature have also been developed by local vendors and found to be performing satisfactorily. Other parts/components are procured from OEM. Effort is being made to further decipher equivalent branded/local parts and search for equivalent parts is a continuous process. The search for equivalent parts has to be done very cautiously since one incompatible part can affect several other parts/assemblies adversely and may lead to heavy damages/immobilization of machine for a long time. Any failure of the track machine during the traffic block is treated as accident and affects the train operation.

i) It is observed by the committee that:

- Unit cost of operation of various machines on Indian Railways was analyzed and it is seen that the cost of spares constitutes approximately 8% to 10% of the unit cost of operation. However, the cost of the spares for the machines is dependent on the condition and the age of the machine.
 - The selection of source of procurement of spares is critical to the health and performance of machines and any failure of the machine not only results in financial loss to the Railway but also affects the maintenance of the track and may affect the train operations adversely and also lead to unsafe conditions for running trains. The failure of the machines also shakes the confidence of the railway administration to grant traffic blocks for their operation.
 - The procurement of spares being done at present is from the following sources.
 - a) Original Equipment Manufacturer(OEM)
 - b) Branded items from different suppliers
 - c) Manufactured items on the basis of RDSO drawing and specifications
 - d) Manufactured items on the basis of OEMs sample.
 - The committee observes that detailed technical specifications of most of the parts cannot be prepared being patented items of the machine manufacturer. The committee is, therefore, of unanimous view that till the time adequate local capacity and capabilities are established for availability of reliable equivalent spare parts of the track machines based on fitment and functional requirements, most of the items should be procured either from OEM or from already identified brands used by the original part manufacturer for reliability and longer life. This is necessary for ensuring good health of the machines which are vital for track maintenance and safety of the running trains as discussed in para 3 above.
- ii) The committee deliberated upon the list of critical items compiled by RDSO for track machines and broadly identified the items to be procured from OEM/original

item manufacturer, those to be procured from specific manufacturer (branded items) and items to be procured from local vendors (own make items).

- iii) The committee observed that there is large number of items being used and decided to nominate a sub-committee of the experienced officers to go into the details of the various components being used in the machines and classify them in various categories based on the past experience on Indian Railways. A subcommittee of the following officers working in CPOH workshops, RDSO and zonal railways were nominated to compile the list of spares in various categories.

1. Shri. D. Satyanarayana, Dy.CE/TM/SECR
2. Shri. S.K.Asthana, XEN/TMC/HQ/ALD
3. Shri. Muslim Ahmed, ARE/TM/RDSO
4. Shri. S. D. Mahajan, AEN/TM/WR
5. Shri. K. Srinivasa Rao, AEN/TM/RYP

The list of items has been classified in following categories:

- a) Items to be procured from OEM
- b) Items to be procured from branded suppliers.
- c) Items to be procured from local manufacturers

Since there is a huge list of items being used on Track Machine, the subcommittee has considered items which are being procured by CPOHs/zonal railways at present. The items which are not included in any of the annexures at present should be procured by Zonal railway/CPOH as OEM/Branded/Own make depending upon the type and criticality of the item with the approval of CE/Track Machines. The details of the same should be advised to RDSO duly recommending as per para 6 for deliberations by the standing committee for inclusion in appropriate list.

3.1. OEM/Branded/Own make

3.1.1. **OEM items:** The units/components for which no brand has been identified till now nor any drawing and specification has been developed by RDSO or railways are to be procured from OEM and is enclosed as Annexure-I. As of now, there are 4721 items in this category. The following types of item mainly are taken in Annexure-I.

- i) Hydraulic filters used on track machine and other hydraulic components for which no brand has been identified till date.
- ii) All types of printed circuit boards (PCB) used on track machine and their components.
- iii) ZF gear box and its spares.

- iv) Most of the Hydraulic valves, pumps and motors for which no brand has been identified/used.
- v) Electronic spares not identified for any brand like data cable, gauges, digital display, sensor and switches.
- vi) Pneumatic valves used in brake circuit including brake cylinder.
- vii) Transmission gear boxes and their housing, cardon shafts
- viii) Clutch assemblies of BCM/FRM machines.
- ix) Engine spares
- x) Hydraulic coolers and radiators

3.1.2. **Branded items:** Branded items include those items which are brought out items of OEM and equivalent items of other reputed manufacturers used and tested successfully either by CPOH or zonal railways. As on date, a list of 1283 items has been included in this category and is given in Annexure-II. The brand name has also been included in the list. Mainly following type of items are taken in this category:

- i) Hydraulic pump and motor for which brand is already identified and established.
- ii) Hydraulic hoses, pneumatic hoses, hydraulic and pneumatic gauges, pneumatic valves and cylinders.
- iii) Transducer, potentiometers, cables, lights and batteries.
- iv) Most of the bearings.
- v) Hydraulic seals, rotary seals for axles and gear boxes.
- vi) Some of the hardware such as important fasteners, HTS bolts etc.
- vii) Hydraulic and pneumatic adopters
- viii) Accumulators

3.1.3. **Own make items:** Own make items include those units / components for which drawing and specification have been developed by RDSO/CPOH/zonal railways. The items for which drawings and specifications have been developed by RDSO are included in the list as Annexure-III(A). The items being procured by CPOH/zonal railways for which they have developed their own drawing and specification have been included in the list as Annexure- III(B).

3.2. **Spare Part Numbering (SPN) system**

Each and every spares has been assigned a 11 digits identification number henceforth called **SPN (Spare Part Number)**. There are six types of coding number for proper nomenclature such as **A.BB.CCCC.D.EE.F**. Meaning of each letter and group of letters are deliberated as under-

A	Main Group
BB	Two digit sub group
CCCC	Four digit serial number of component/unit
D	OEM/Branded Items/Own make Items
EE	Indian Railway/Zonal Railway
F	Check digit (sum of all above nine digits in single digit)

SPN number will be followed by two alphabets for identification of the manufacturer of the machine or the engines. These two alphabets will be used only for the purpose of sorting by the user and not for indenting purpose.

- i) First digit marked as **A** has been allotted for main group of machine assemblies with 1 to 9 such as hydraulics, electronics, tamping unit etc. Details of sections are given in Para 3.3
- ii) Second and third digit marked as **BB** has been allotted for sub group as given in Para 3.4
- iii) Fourth, fifth, sixth and seventh digit marked as **CCCC** has been allotted for serial number of component/unit in each sub group with 0001,0002 and so on as per Annexure-I, II & III.
- iv) Eighth digits marked as **D** has been allotted for classification of item under the head of OEM, Branded and Own make etc.

Category	Code
OEM Items	1
Branded Items	2
Own Make Items	3

- v) Ninth and tenth digits marked as **EE** for identifying the SPN allotted for Indian Railways or by Zonal Railway as under :

Railway	Code
Indian Railway	01
CPOH/ALD	02
CPOH/RYP	03
CPOH/ER	04
CPOH/WR	05
Central Railway	06
Eastern Railway	07
East Central Railway	08

Railway	Code
East Coast Railway	09
Northern Railway	10
North Central Railway	11
North Western Railway	12
North Eastern Railway	13
North Frontier Railway	14
Western Railway	15
West Central Railway	16
Southern Railway	17
South Eastern Railway	18
South Western Railway	19
South Central Railway	20
South East Central Railway	21
South Coast Railway	22
Metro Railway, Kolkata	23

Further during periodical updating of the list, Zonal Railway items will be included in Indian Railway list by standing committee as per para 6.

- vi) Eleventh digits marked as **F** is the check sum of sum for all previous 10 digits.
- vii) The committee has limited it's scope for assigning SPN for spares for track machines and consumables. Other items such as stock items, T&P etc. have not been considered for which separate system of procurement is existing.

3.3. Main Group

All Items of Track machine have been classified under nine main groups/assemblies with unique numeral as under:

Main Groups	Code
Engine & Compressor	1
Hydraulics	2
Pneumatics	3
Electrical & Electronics	4
Axle & Gear Box	5
Tamping Unit & Lifting Unit	6

Main Groups	Code
Bearings	7
Hardware, General Machine items and Consumables	8
Rubber Items	9

3.4. Sub group

Items/spares of each main group are classified in following subgroups for its identification.

S.N.	Main Group	Sub Group	Code
1	Engine & compressor	Cummins	01
		Deutz	02
		Greaves	03
		Kirlosker	04
		SUN	05
		Lombardier	06
		Mahindra	07
		Caterpillar	08
		Ashok Leyland	09
2	Hydraulics	Hydraulic Pumps	01
		Hydraulic Motors	02
		Hydraulic Valves	03
		Hydraulic Cylinders & Accessories	04
		Critical Hydraulic Hoses & Fittings	05
		Hydraulic Hoses & Fittings	06
		Hydraulic coolers, accumulators and others	07
		Hydraulic Filters	08
		Hydraulic Seals	09
		Hydraulic Adapters	10
		Hydraulic Gauges	11
3	Pneumatic	Pneumatic Valves	01
		Pneumatic Brake System	02
		Pneumatic Cylinders	03
		Pneumatic Hoses	04
		Pneumatic Adapters	05
		Pneumatic Others	06
		Pneumatic Seals	07

S.N.	Main Group	Sub Group	Code
4	Electrical & Electronics	PCB, Power Supply & Transformer	01
		Relay, IC, Transistor, Capacitor, Diode, Coil & Rectifier	02
		Switch & Contact Element	03
		Gauges, Sensors, LED, Encoders & Indicators	04
		Transducer, Potentiometer & Resistance	05
		Pendulum	06
		Electricals Cables	07
		Circuit Breakers, Fuses, Coupler, Socket, Plug, Chord Wire & Angle Gear	08
		Fans, All Lights, Battery, Self-Starter, Alternator & Motor	09
		ALC, Panel, CWS,CMS, DAR & DRP	10
5	Gear Box & Axles	ZF Gear Box	01
		Gear Box Housing	02
		Gears & Shafts	03
		Flanges &Couplings	04
		Cardan Shaft	05
		Pins, Bushes and Others	06
		Axles & Axle Assembly Complete	07
		Wheels	08
		Bogie & Housing	09
		Mechanical Brake assembly & Torque plates	10
		Sensing unit	11
		BCM Clutch Assemblies	12
		Complete Gear Box	13
6	Tamping and Lifting Units	Sq. Cylinder, Tool Tilting Cylinder	1
		Taming Unit Gear Box/Tamping Bank	2
		Taming Arms	3
		Vibration Shaft	4
		Guide Rod, C R Bolts, Sleeve, Pins & Other miscellaneous	5
		P.B. Bushes	6
		Fly Wheel, Flanges, Spacers, Couplers & Bracket	7
		Tamping Tools	8