

Indian Standards on Farm Power and Machinery (Tractors, Power Tillers, Harvesters and Power Threshers)



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FAD 11 Agricultural Machinery and Equipment Sectional committee

- **Tractors and Power Tillers** : **84**
- **Harvesting/Threshing** : **31**
- **Sowing Machines** : **10**
- **Tillage Machines** : **24**
- **Gardening and Forestry Tools** : **45**
- **Crop Protection Equipment** : **27**

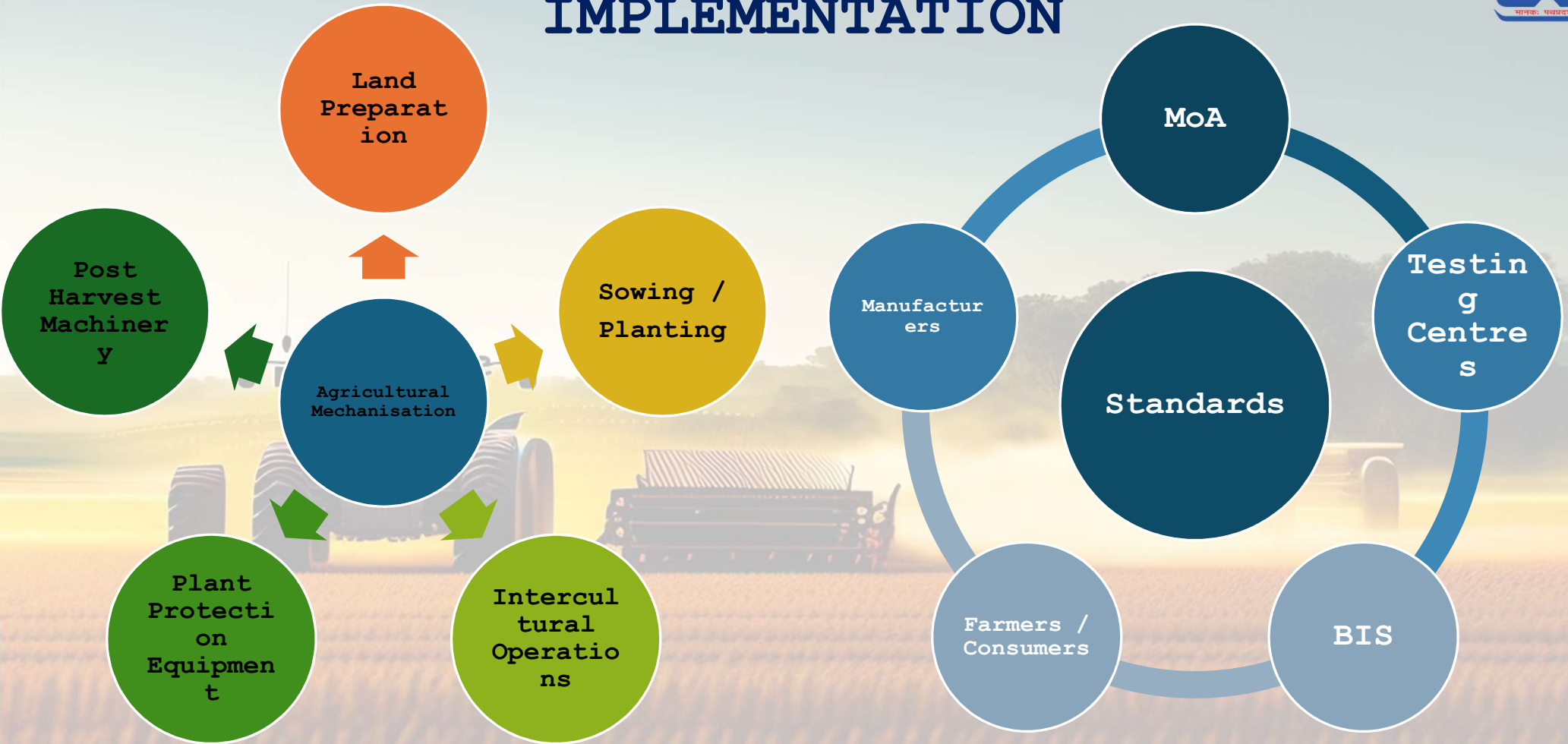
The List of Standards –

- **Number of Total Standards** : **221**
- **Number of Product Specification:** **128**
- **Code of Practices** : **14**
- **Methods of Test** : **48**
- **Terminology** : **15**
- **Dimensions** : **05**
- **Safety Standard** : **01**
- **Other** : **10**



Microsoft Word
Document

IMPLEMENTATION



Sub Mission on Agriculture Mechanisation , Crop Residue Management

TESTING CENTRES



Under Ministry of Agriculture

1. Central Farm Machinery Training and Testing Institute, Budni
2. Northern Region Farm Machinery Training and Testing Institute, Hisar
3. Southern Region Farm Machinery Training and Testing Institute, Anantpur
4. North Eastern Region Farm Machinery Training and Testing Institute, Biswanath Chirali

Recognised by Ministry of Agriculture

There are total 38 Testing Centres Recognised by Ministry of Agriculture for Testing of Farm Machinery. The List can be accessed through link given below-
[Testing Centre](#)

IS 12207 : 2022 Agricultural tractors — Recommendations on selected performance characteristics (*fifth revision*)

Scope

This standard specifies the recommendations on selected performance characteristics of agricultural and forestry tractors fitted with diesel engines only

Purpose

Main purpose of this standard is to assess the conformity of various models of Agricultural Tractors to performance characteristics for introducing or launching in India and also selecting the same for financing

Evaluative Requirements (clause 3.3)

Requirements under this category are the ones which are mandatory for acceptance of the tractor for the purpose of subsidies/financing.

Non Evaluative Requirements (clause 3.4)

Requirements under this category are the ones which are not mandatory for acceptance of the tractor for the purpose of subsidies/financing. However, the authorized testing institute shall observe the performance for these requirements and record in the test report



IS 12207 : 2022 Agricultural tractors — Recommendations on selected performance characteristics (*fifth revision*)



This Standard Covers

1

Assessment of the evaluative requirements applicable for qualifying minimum performance criteria of the agricultural tractors

2

Tolerances on the values declared by the manufacturer and in certain cases **minimum/maximum values of the performance characteristics** and statutory requirements under the relevant act(s) of the agricultural tractors

3

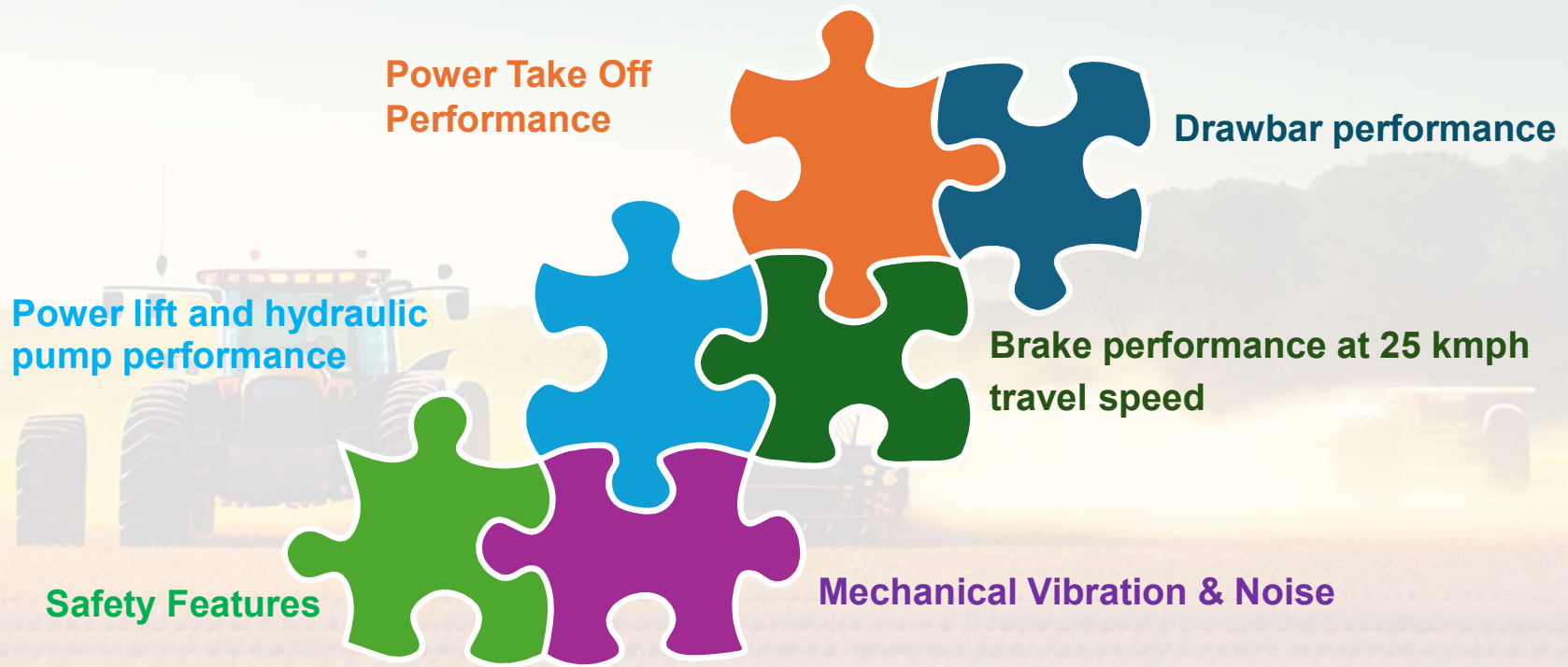
Criteria for **determining variants and new model of tractors** for the purpose of testing and certification, and

4

Criteria for providing **administrative extension and technical extension** to earlier tested tractor model

[For Details- IS 12207](#)

IS 12207 : 2022 – Important Performance Characteristics (Clause 4, Table 1)



[For Details- IS 12207](#)

Different Test Performed on Agricultural Tractors

PTO Performance

IS 12036

Power Lift and Hydraulic Pump Performance

IS 12224

Noise Measurement

IS 12180 Part 1 and 2

Wetland Cultivation

To be done if recommended

Drawbar Performance

IS 12226

Break Performance

IS 12061 : 1994

Air Cleaner Oil Pull Over

IS 5994

Safety and Labelling



Different Test Performed on Agricultural Tractors

IS 12036 (PTO)

Maximum power absolute

Maximum power at rated engine speed

Power at Varying Speed at Full Load

Varying Load Tests

IS 12226 (Drawbar)

Transmission Characteristic Test

Varying Drawbar Pull and Speed at Full Load

Fuel Consumption

Ten-Hour Test

IS 12224 (Hydraulics)

Hydraulic Lift Capacity Test

Hydraulic Power Test

Hydraulic Pump Test

Maintenance of Lift of Load



BENEFITS OF USING TRACTORS COMPLIANT WITH PERFORMANCE PARAMETERS AS PER IS 12207

- Accepted for Financing and subsidy
- Compliance of regulatory requirements of CMVR for lighting, noise, vibration etc
- Fuel Saving
- Reduced oil consumption
- Higher Backup Torque
- Improved drawbar performance resulting in better field performance
- Compliance of Break performance results in improved road safety
- Suitability for wetland cultivation
- Better Lifting capacity and hydraulic pump performance results in better performance in operating heavy equipment like land leveler etc

IS 12239 (Part 1) : 2018/ ISO 4254-1 : 2013 GUIDE FOR SAFETY AND COMFORT OF OPERATOR OF AGRICULTURAL TRACTORS AND POWER TILLERS PART 1 GENERAL REQUIREMENTS

Safety requirements and the means of their verification for the design and construction of self-propelled ride-on machines, mounted, semi-mounted and trailed machines used in agriculture in order to deal with the hazards which are typical for most of the machines

Specifies the type of information on safe working practices including information about residual risks to be provided by the manufacturer

Deals with significant hazards, hazardous situations and events, relevant to this agricultural machinery when used as intended and under the conditions of misuse foreseeable by the manufacturer during normal operation and service

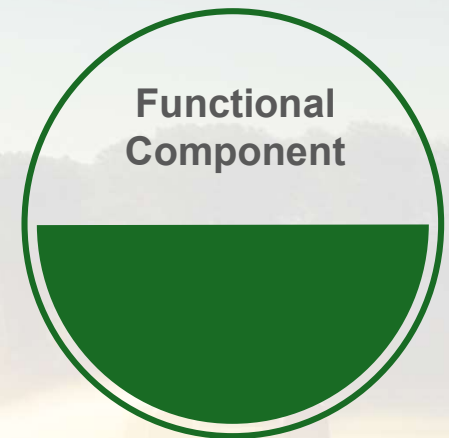
Fundamental principles, design guidance (*Clause 4.1*)



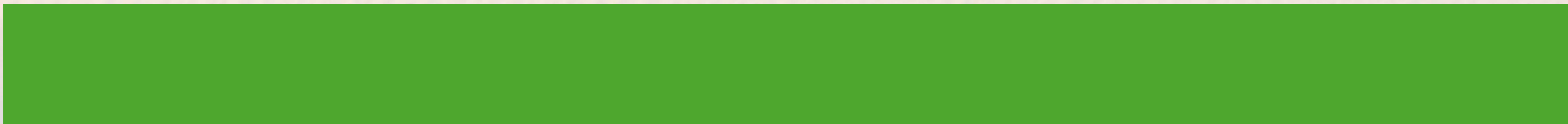
Should be carried out by the manufacturer to determine the hazards that are applicable to various machines.



Manufacturer is responsible for the specification and provision of safety measures to deal with all hazards.



Functional components which need to be exposed for proper function, drainage or cleaning shall be guarded without causing other hazards



Safety requirements and/or measures applicable to all machines



Protection from moving parts involved in the work (4.2)

Noise (4.4)

Vibration (4.3)

Controls (4.5)

Pedals, Hand operated control

Automatic mode of operation (4.6)

Operator stations - Boarding means (4.7)



Safety requirements and/or measures applicable to all machines – Operator Station (*Clause 4.7*)



Steps and ladders

Handrails/handhold

Platforms

Operator seat

Place to stand



Dimension and Connections

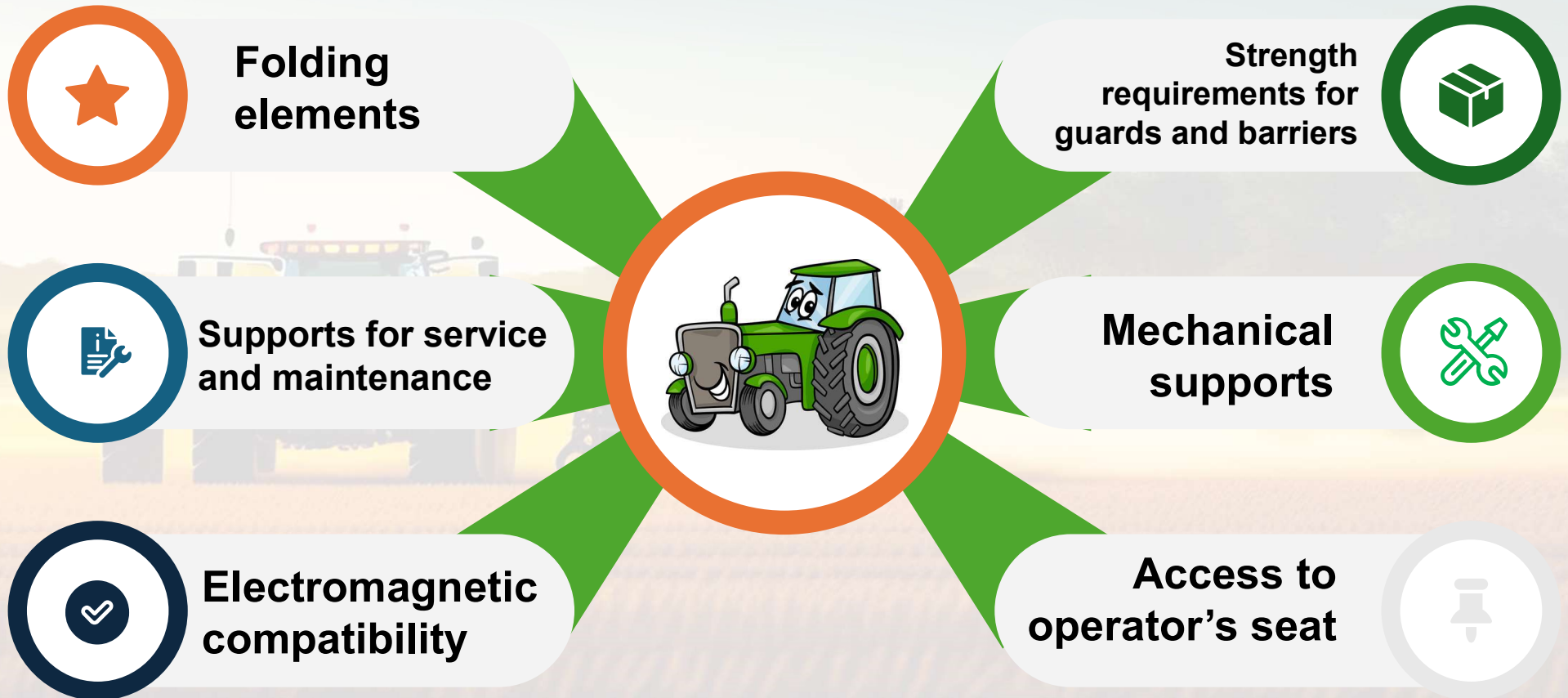
Three-point contact support

flat and have a slip-resistant surface

a seat for each ride-on driver and operator

sufficient space, be flat and have a slip-resistant surface

Safety requirements and/or measures applicable to all machines – Other than Operators Stations (*Clause 4.8*)



Safety requirements and/or measures applicable to all machines - Self-propelled ride-on machines (Clause 5)



Propulsion and steering

Operator's seat

Shearing and pinching points

Emergency exit



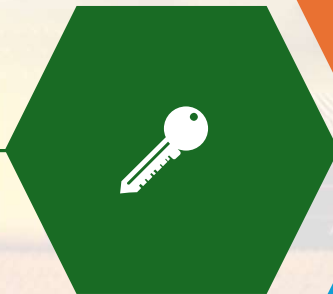
Safety requirements and/or measures applicable to all machines (*Clause 5.1.6*)



Cab material burning rate



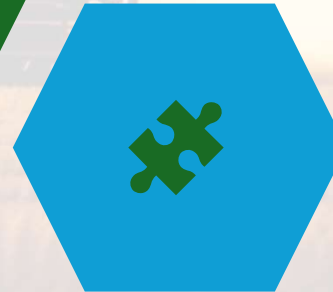
Starting and stopping the engine



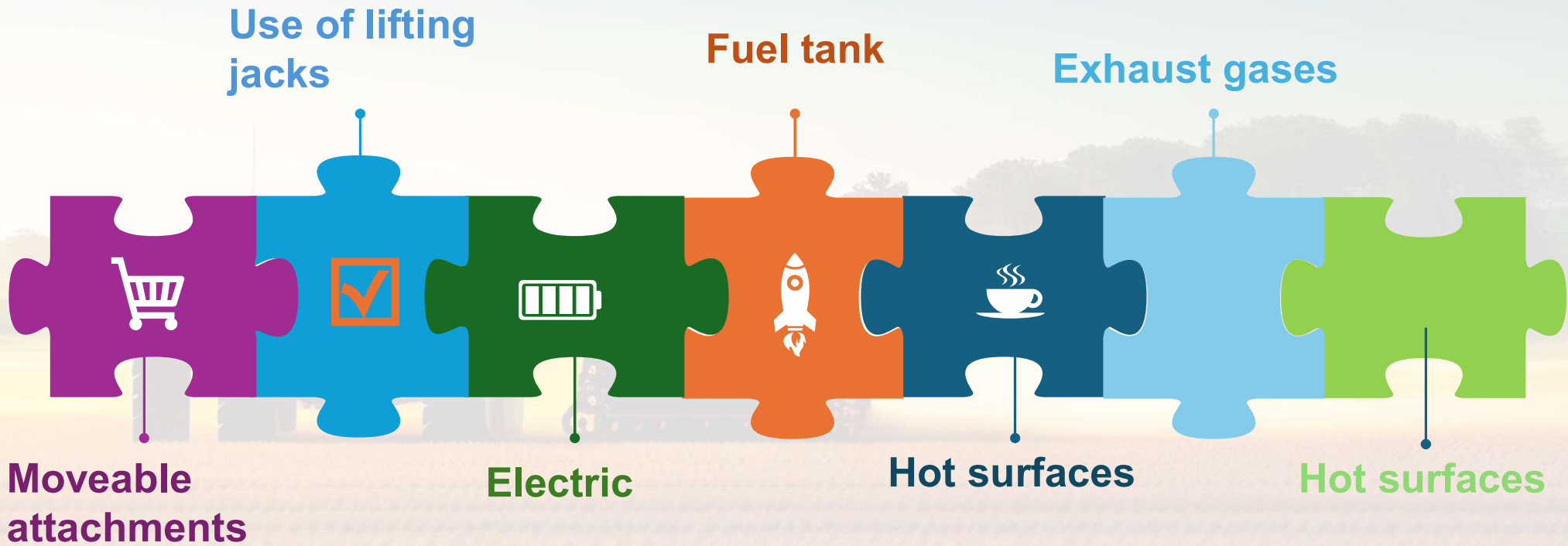
Visibility



Attachments for towing



Safety requirements and/or measures applicable to all machines (*Clause 5.2*)



For Details- IS 12239 Part 1

STEPS FOR SAFELY USING A FARM TRACTOR

Mind the other farm labours around the tractor

Drive with care

Hitching safely

Mind the Living

Other implements and their safety operation

The driver's seat matters

Lookout for overhead electric powerlines

Being cautious is the key

How to prevent overturning?



Safety Requirements for Agricultural Tractors, IS 12239(Part 2)



Increased use of agricultural tractors and power tillers for various agricultural operations, the need of human safety has attained importance

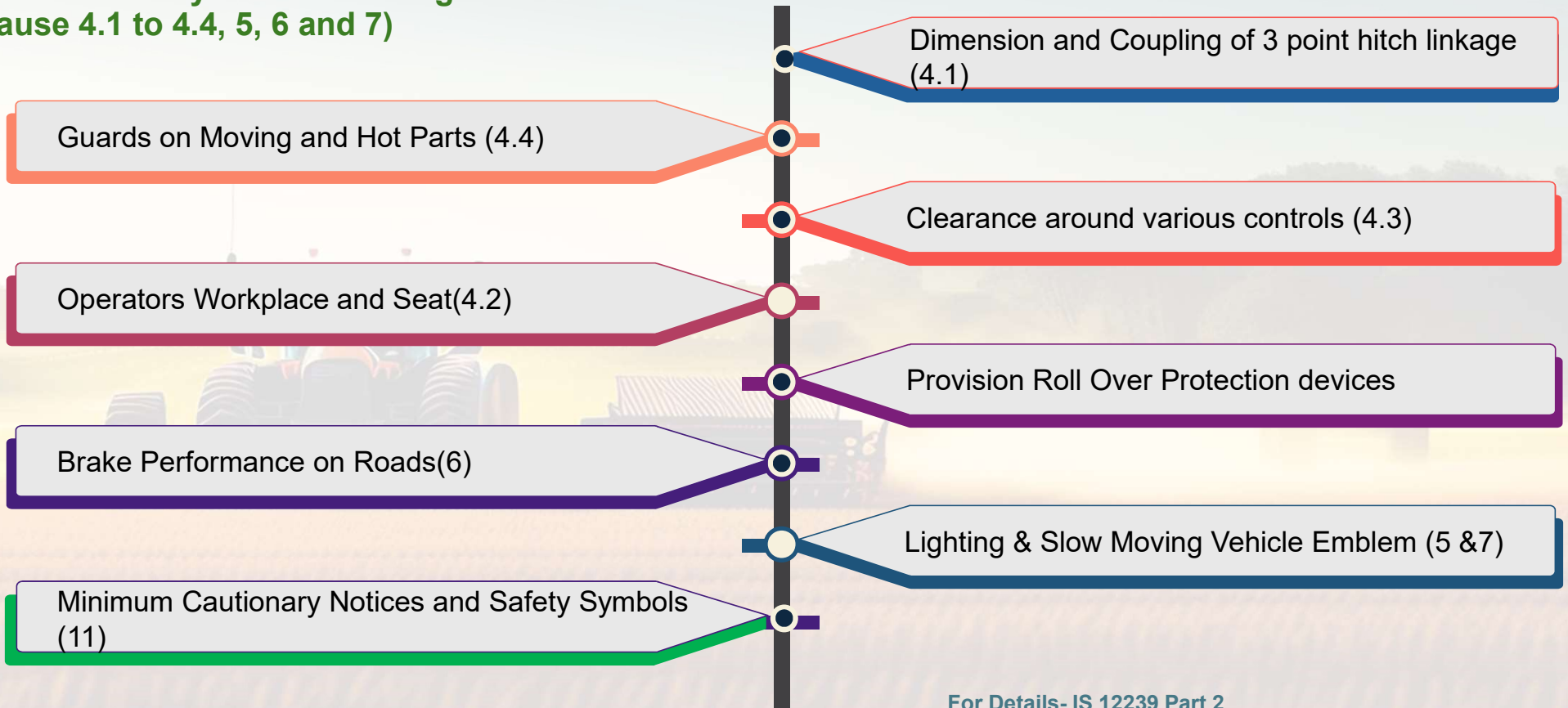
This standard (Part 2) covers constructional and operational requirements for improving the degree of personal safety of operator of the agricultural tractor



Safety Requirements for Agricultural Tractors, IS 12239(Part 2)

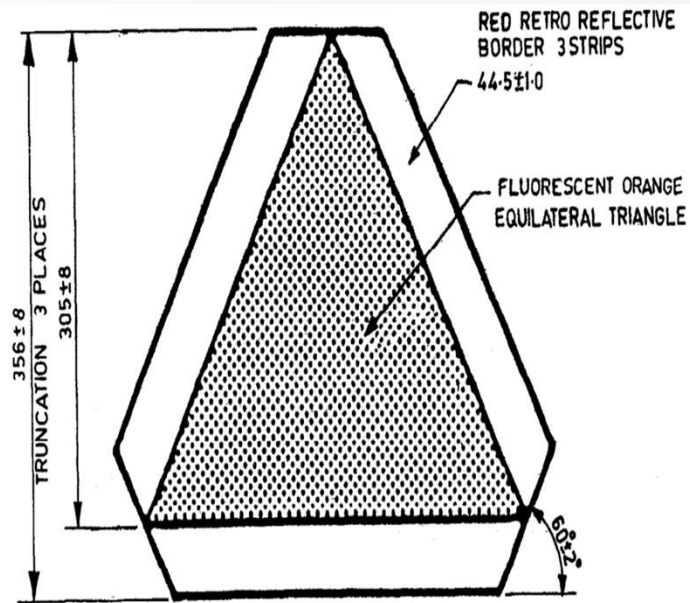


Important Safety Features for Agricultural Tractors (Clause 4.1 to 4.4, 5, 6 and 7)



[For Details- IS 12239 Part 2](#)

Safety Requirements for Agricultural Tractors, IS 12239(Part 2)- Slow Moving Vehicle Emblem



NOTE — Emblem must be mounted with the point upward.

FIG. 9 SLOW-MOVING VEHICLE IDENTIFICATION EMBLEM









Benefits of compliance to the Safety Requirements for Agricultural Tractors, IS 12239(Part 2)

- Improved safety during Road Transport
- Roll over Protection devices prevent turning over of tractors during field operations
- Proper clearance around operators work place ensure safety of operators
- Guards over moving parts prevent accidents due to strangling of clothing or body parts getting inside the moving parts
- Guards over hot parts prevent from coming in contact of body parts.
- Safety compliance of drawbar and three point hitch prevent accidents during coupling and handling of tillage implements and other machinery
- Improved degree of personal safety of operator

IS 13539 : 2018 Power tiller — Recommendations on selected performance and other characteristics



Introduction

-  agricultural machinery used for soil preparation having a single axle, in which the direction of travel and its control during field operation is performed by the operator
-  self-powered, self-propelled, and can pull cultivator, harrow, plough, various seeder, harvester and such other suitable attachments
- 
 - maximum speed of the power tiller when coupled to a trailer shall not exceed 22 kmph
 - minimum rated horse power output of the power tiller engine shall not be less than 8 bhp
-  may be walk behind or riding attachment type and should be capable of being coupled to a trailer that can be used for transportation of goods of not less than 1 ton capacity.

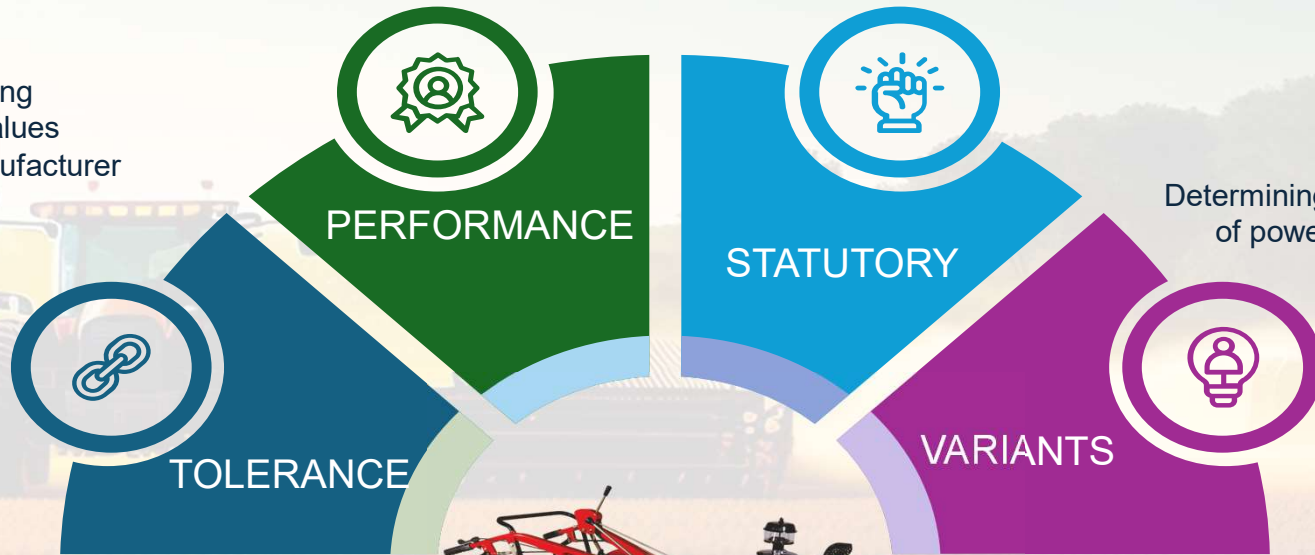
IS 13539 : 2018 Power tiller — Recommendations on selected performance and other characteristics (Clause 4, Table 1)

minimum/maximum values of the performance characteristics

statutory requirements under the relevant Act(s) of the agricultural power tillers

Criteria for determining Tolerances on the values declared by the manufacturer

Determining variants and new model of power tillers for the purpose of testing and certification



TOLERANCE

VARIANTS



IS 13539 : 2018 Power tiller — Performance Characteristics and Different Test Performed on Power Tillers (*Clause 4, Table 1*)



1

Engine Performance

2

Rotary Shaft
Performance

3

Drawbar Performance

4

Brake performance

5

Noise measurement

6

Air cleaner oil pull over

7

Wetland cultivation

8

Safety features

9

Labelling

[For Details- IS 13539](#)



BENEFITS OF USING POWER TILLERS COMPLIANT WITH PERFORMANCE PARAMETERS AS PER IS 13539 : 2018

- Accepted for Financing and Subsidy
- Compliance of regulatory requirements of CMVR for lighting, noise, vibration etc
- Fuel Saving
- Reduced oil consumption
- Reduced coolant consumption
- Better rotary shaft performance
- Compliance of Break performance results in improved road safety
- Suitability for wetland cultivation

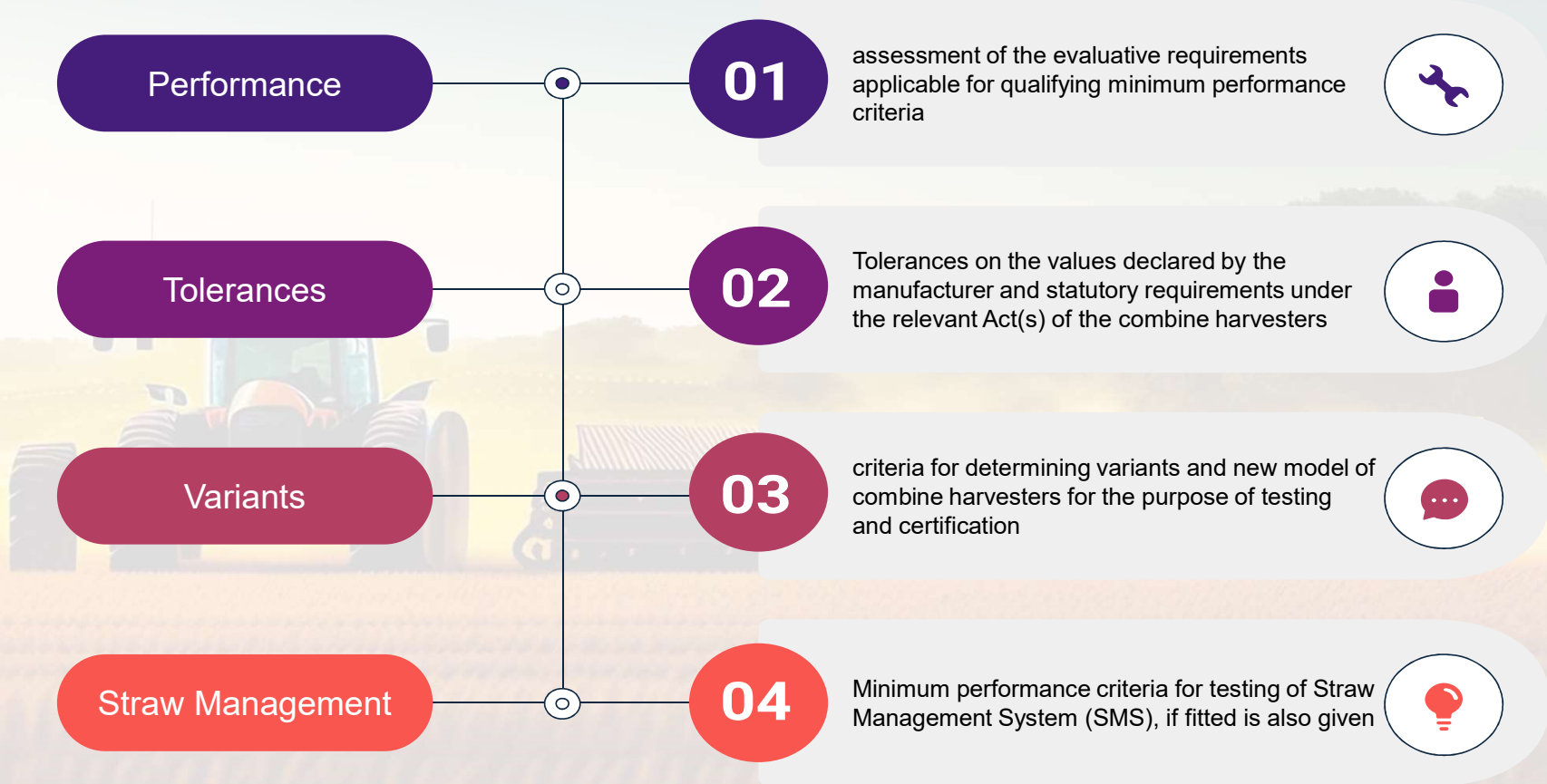
IS 15806 : 2018 COMBINE HARVESTER — RECOMMENDATIONS ON SELECTED PERFORMANCE AND OTHER CHARACTERISTICS



Combine harvester



IS 15806 : 2018 COMBINE HARVESTER — RECOMMENDATIONS ON SELECTED PERFORMANCE AND OTHER CHARACTERISTICS (Clause 4.1)



[For Details- IS 15806](#)

IS 15806 : 2018 Combine Harvester — Performance Characteristics and Different Test Performed on Combine Harvester (*Clause 4, Table 1*)



1

Prime mover performance

2

Brake Performance

3

Mechanical Vibration

4

Air cleaner oil pull over

5

Noise measurement

6

Field Performance

7

Header Lifting Test

8

Safety features

9

Field Performance for Straw Management System

BENEFITS OF USING COMBINE HARVESTERS COMPLIANT WITH PERFORMANCE PARAMETERS AS PER IS 15806 : 2024



- Accepted for Financing and Subsidy
- Compliance of regulatory requirements of CMVR for lighting, noise, etc
- Fuel Saving and Reduced oil consumption
- Reduced Field Losses
- Higher threshing efficiency
- Higher cleaning efficiency
- Less non-collectible losses
- Compliance of Break performance results in improved safety during travel on Road
- Suitability for Straw Management

IS 18717 : 2024 STRAW MANAGEMENT SYSTEM (SMS) FOR COMBINE HARVESTERS — PERFORMANCE TEST METHOD



This standard covers the methods of tests to be conducted to assess the performance of straw management system (SMS) mounted on a combine harvester

Straw management system (SMS) for combine harvesters is an agricultural machinery used to facilitate in-situ management of crop residue. Generally, SMS is attached near to the straw discharge outlet of combine harvester to collect, chop and uniformly spread loose chopped straw on the harvested field.

IS 18717 : 2024 - Acceptance Criteria in Case of Breakdowns/ Defects (Clause 4.2)



The product may be accepted subject to the following conditions:

There is no 'critical breakdown' during the course of testing

There are not more than two 'major breakdowns' and neither of them is of repetitive nature

There are not more than five 'minor defects' during the test and the frequency of any defect is not more than two

In no case, the total no. of breakdowns exceeds five that is, (2 major + 3 minor) or (1 major + 4 minor) or 5 minor breakdowns

[For Details- IS 18717](#)

IS 9020:2002 SAFETY REQUIREMENTS FOR POWER THRESHERS



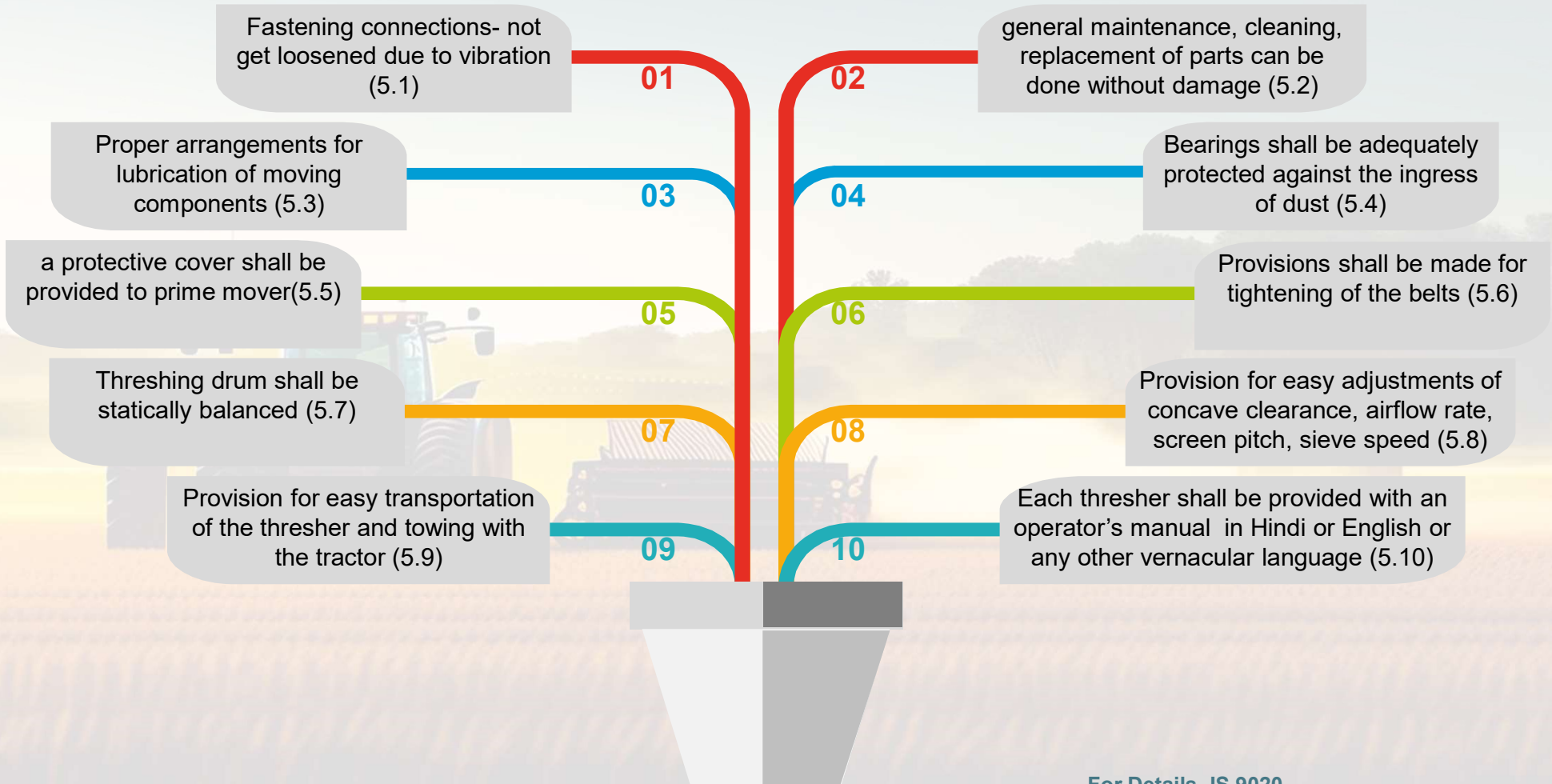
Mechanization of the threshing operations in the country also brought in its wake a chain of accidents to farm workers resulting in their temporary or permanent disability. This brought to the fore the need for some immediate measures to safeguard the farm workers against avoidable accidents be it due to any of the vulnerable factors of machine, man, etc. As a number of reports of many farm workers specially the young losing their limbs poured in, the urgency to provide for safety provisions in the threshers became more pronounced.

Punjab Agricultural University, Ludhiana conducted a survey on the accidents during the wheat threshing season of 1976. 294 cases were examined and it was observed that the factors responsible for accidents are as under:

<i>Factors of Accidents</i>	<i>Percentage</i>
Human	72.9
Machine	12.9
Crop	9.0
Situational	5.2

Observing the Criticality of the machinery, the standard was developed to cover the safety requirements of Power Threshers :

IS 9020:2002 SAFETY REQUIREMENTS FOR POWER THRESHERS



[For Details- IS 9020](#)

PROBLEMS FACED DUE TO NON-COMPLIANCE TO SAFETY REQUIREMENTS AS PER IS 9020:2002



- With improper feeding systems and feeding hoppers, hands getting inside the thresher during feeding of crop resulting in serious accidents
- In the absence of guards over moving parts, cloths may get caught in the moving parts resulting in serious accidents
- Poor Strength of guards and sheet if less thickness is used
- More accidents due machine causes
- Undue sound or chatter or vibrations during operation of thresher
- Accidents may occur due to overturning if power thresher is not stable

IS 17626:2021 SELF-PROPELLED SUGARCANE HARVESTER - TEST CODE



A sugarcane harvester is a large agricultural machinery used to harvest and partially process sugarcane.

Sugarcane harvester should be able to cut the whole cane from base, detrash it, detop it and may put the cut cane in the container attached behind or may windrow the cut crop.

Covers the Following

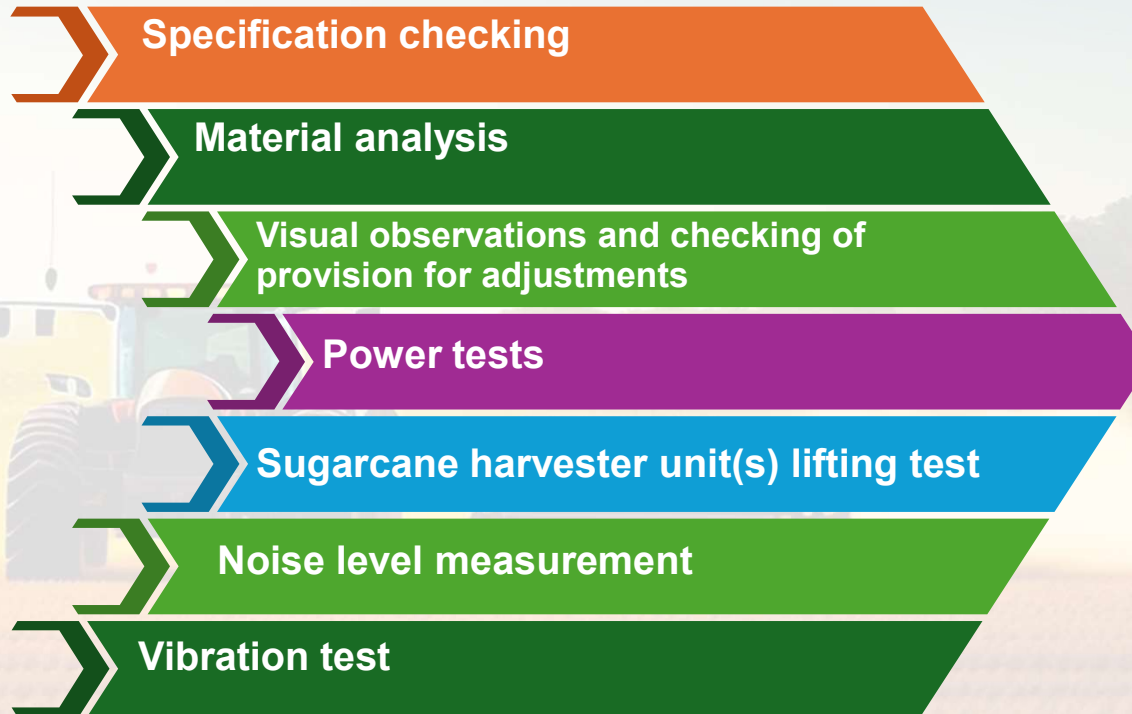
- Methods of performance testing of Self-propelled type sugarcane harvester
- Criteria for determining variant model and new model of sugarcane harvesters

Type of Sugarcane Harvester

- Whole Stalk Harvester
- Cut-Chop Harvester or Chopper Harvester



IS 17626:2021 – Tests Covered (*Clause 5.1*)



**LABORATORY
TESTS**

IS 17626:2021 – Field Tests Covered (*Clause 5.2*)

Cont...



- Operator's field of vision
- Brake test
- Air cleaner oil pull-over test (if applicable)
- Turning ability test(s)- Determination of turning and clearance diameter, Determination of steering effort
- Position of Centre of Gravity
- Components/assembly inspection

[For Details- IS 17626](#)



THANK YOU