SPECIFICATION OF SELF PROPELLED COMBINE HARVESTER (Wheel Type)

1. SPECIFICATION

1.1 General

Name & address of manufacturer	:
Make	:
Model	:
Brand name (if any)	:
Type	:
Year of manufacture	:
Country of origin	:

1.2 Prime mover

Make	:
Model	:
Type	:

Engine speed (rpm) (Manufacturer's recommended setting)

Maximum speed at no load, rpm	:
Rated speed, rpm	:
No load engine speed recommended for field operation, rpm	:
Low idle speed, rpm	:
Country of origin	:
Details of Emission Certificate if any	:

1.2.1 Cylinder and cylinder head

Number	:
Disposition	:
Bore/Stroke, mm	:
Capacity, cm^3	:
Compression ratio	:
Arrangement of valves	:
Type of cylinder liners	:
Type of head	:
Type of combustion chamber	:
Valve clearance in cold, mm	
Inlet valve	:
Exhaust valve	:

1.2.2 Fuel system

Type of fuel system	:

1.2.2.1 Fuel tank

Material	:
Size, mm	:
capacity, l	:

1.2.2.2 Fuel feed pump

Make	:
Type	:
Model/Group combination number	:

1.2.2.3	**Fuel filters**	
	Make	:
	Model/Group combination No.	:
	Number (s)	:
	Type of element	:
	Capacity of final stage filter, l	:
	Water separator (Provided/ not provided)	
1.2.2.4	**Fuel injection pump**	
	Make	:
	Model/Group combination No.	:
	Type	:
	Method of drive	:
1.2.2.5	**Fuel injectors**	
	Make	:
	Type	:
	Model/Group combination No.	:
	Injection opening pressure, (kgf/cm^2)**)**	:
	Injection timing	:
	Firing order	:
1.2.3	**Governor**	
	Make	:
	Type	:
	Designation	:
	Governed range of engine speed, rpm	:
1.2.4	**Air Intake System**	
	Type	:
1.2.4.1	**Pre-cleaner**	
	Make	:
	Type	:
	Number	:
	Location	:
1.2.4.2	**Air cleaner**	
	Make	:
	Type	:
	Number	:
	Location	:
	Type of element	:
	Service indicator	:
	Dust unloading valve	:
	Recommended service Schedule	:
	Suction pressure at max. power, kPa	:
1.2.5	**Exhaust**	
	Make	:
	Type	:
	Pressure at max. power, kPa	:

	Provision of spark arresting device/any other device	:
1.2.5.1	**Details of turbocharger**	
	Make	:
	Model	:
	Number of fan/wheels	:
	Number of blades	
	Turbine wheel	:
	Compressor fan	:
	Means of lubrication	:
1.2.5.2	**Charged air cooler (CAC) unit**	
	Type	:
	Make	:
	Size(LXWXH), mm	:
	No of Tubes	:
1.2.6	**Lubrication system**	:
	Type	:
	Type of oil pump	:
	Method of drive	:
	Lub. oil pump rpm corresponding to rated rpm of engine, rpm	:
	Oil sump capacity, l	:
1.2.6.1	**Filters**	
	Make	:
	Type of oil filters	:
	Relief valve pressure setting, kgf/cm^2,	:
	Minimum permissible pressure, kgf/cm^2,	:
1.2.6.2	**Details of oil cooler (if any)**	
1.2.7	**Cooling system**	:
	Type	:
1.2.7.1	**Water pump**	
	Make	:
	Type	:
	Size of impeller, mm	
	Diameter	:
	No. of vanes	:
1.2.7.2	**Details of fan**	
	Material & type	:
	No. of blade	:
	Size, mm	:
1.2.7.3	**Radiator**	
	Make	:
	Type and Radiator cap pressure, kgf/cm^2	:
	Means of temperature control	:
	Bare radiator capacity, l	:

	Total coolant capacity, l	:
	Means of grill cleaning, if any	:
1.2.8	**Details of Air Compressor if any**	
1.2.9	**Starting system**	
	Type	:
	Any aid for cold starting	:
1.2.10	**Electrical system**	
1.2.10.1	**Starter motor**	
	Make	:
	Type	:
	Model/ Group combination No.	:
	Power, kW	:
1.2.10.2	**Alternator**	
	Make	:
	Model/Group combination No.	:
	Output rating	:
1.2.10.3	**Voltage regulator**	:
1.2.10.4	**Battery**	
	Make	:
	Model/Type No.	:
	Type	:
	20 h rating	:
1.2.10.5	**Horn**	
	Make	:
	Type	:
1.3	**Combine**	
1.3.1	**Wheel equipments**	
1.3.1.1	**Drive wheel**	
	Make	:
	Type	:
	Location	:
	Number, size & Ply rating	:
	Track width, mm	:
	Recommended tyre pressure, kPa	:
	Loading capacity at recommended tyre pressure (kg)	:
1.3.1.2	**Steered wheel**	
	Make	:
	Type	:
	Location	:
	Number/size & Ply rating	:
	Track width (mm)	:
	Recommended tyre pressure, kPa	:
	Loading capacity at recommended tyre pressure (kg)	:
1.3.1.3	**Wheel base, mm**	:

1.3.2	**Transmission system**	
1.3.2.1	**Clutch**	
	Make	:
	Type	:
	Size, mm	:
	No. of friction discs	:
1.3.2.2	**Gear box**	
	Make	:
	Type	:
	No. of speeds	:
	Oil capacity, l	:
1.3.2.3	**Final drive**	
	Make	:
	Type	:
	Reduction ratio	:
	Oil capacity, l	:
1.3.3	**Brakes**	
1.3.3.1	**Service brake**	
	Make	:
	Type	:
	Area of shoe at each wheel side (cm^2)	:
1.3.3.2	**Parking brake**	
	Make	:
	Type and location	:
1.3.4	**Steering system**	
	Make	:
	Type	:
	Outer diameter of steering control wheel, mm	:
1.3.5	**Hydraulic system**	
1.3.5.1	**Hydraulic pump for harvester's hydraulic cylinders**	
	Type	:
	Make	:
	Model	:
	Number(s)	:
1.3.5.2	**Hydraulic pump for steering**	
	Type	:
	Make	:
	Model	:
	Number(s)	:
1.3.5.3	**Hydraulic tank**	
	Type	:
	Number(s)	:
	Capacity of Hydraulic tank, l	:
	No. & type of oil filters	:
1.3.5.4	**No. of hydraulic cylinders**	:
1.3.6	**Reel assembly**	

	Type	:
	Type and Number of tine bars	:
	Size of tine bars, mm	
	Dia.	:
	Length	:
	Dia. and working width of reel, mm	:
	Range of speed corresponding to recommended no load field rpm, rpm	:
	Number of tines on each bar and their spacing, mm	:
	Arrangement for raising and lowering the reel assembly	:
	Safety device in reel drive	:
1.3.7	**Cutter bar assembly**	
	Working width, cm	:
	Effective cutter bar width, cm	:
1.3.7.1	**Knife blades**	
	No. & type of knife blades	:
	Knife drive safety arrangement	:
	Knife stroke, mm	:
	Knife frequency per minute	:
	Knife speed corresponding to recommended no load field rpm, rpm	:
	Type of crop dividers	:
	Arrangement for lifting lodged crop	:
1.3.7.3	**Knife guard**	
	No & type of knife guard	:
	Type	:
1.3.7.4	**Knife back**	
	Type	:
	Dimensions, mm	:
1.3.8	**Cutting platform auger**	
	Type of crop conveyor	:
	Size of auger , mm	
	Speed of auger corresponding to recommended no load field rpm, rpm	:
	Arrangement for adjusting the clearance of crop auger	:
	Auger drive safety arrangement	:
1.3.9	**Details of retractable fingers**	
	Number(s)	:
	Range of throw out, mm	:
	Axial spacing between the fingers, mm	:
	Peripheral distance between the fingers, mm	:
	Arrangement for adjustment of fingers length	:

1.3.10	**Undershot conveyor**			
	Type of feeder conveyor	:		
	No. size and spacing of comb bar	:		
	Conveyor drive safety arrangement	:		
	Speed corresponding to recommended no load engine speed of engine, rpm	:		
1.3.11	**Threshing drum**		**For Wheat**	**For Paddy**
	Type	:		
	Diameter and Width, mm	:		
	Range of speed corresponding to recommended no load field rpm, rpm	:		
	No. of bars	:		
	No. of pegs and their spacing on each bar	:		
	No. of hub plate	:		
	Length of rasp bar/peg bar, mm	:		
	Height of pegs, mm	:		
	Method of speed variation	:		
	Provision of stone trap	:		
	Safety device	:		
1.3.12	**Concave**		**For Wheat**	**For Paddy**
	Overall width of concave, mm	:		
	Effective width, mm	:		
	Type of concave	:		
	No. of bars	:		
	Peripheral length, mm	:		
	Peripheral effective length, mm	:		
	Effective area, sq. cm.	:		
	Details of extension	:		
	Range of clearance, mm			
	Front	:		
	Rear	:		
	Method of adjusting the clearance between drum and concave	:		
1.3.13	**Rear beater**			
	Type	:		
	Size of beater, length and width, mm	:		
	Speed corresponding to recommended no load field rpm, rpm	:		
1.3.14	**Baffle plate (Deflector)**			
	Type	:		
	No. of flap	:		
	Size of Baffle plate, mm	:		
	Method of flap adjustment	:		
1.3.15	**Separating mechanism**			
1.3.15.1	**Straw walkers**			
	Number(s)	:		
	Type	:		
	Size of each straw walker, mm			
	Length	:		
	Width	:		
	Oscillations per minutes corresponding to	:		

	recommended no load field rpm, rpm			
	Provision for varying oscillations of straw walkar	:		
1.3.15.2	**Stepped grain pan**			
	Type	:		
	Size, mm	:		
	Inclination and method of adjustment if any (degree)	:		
1.3.15.3	**Cleaning sieves**			
1.3.15.3.1	**Top sieve**			
	No. of sieve	:		
	Type	:		
			Front	Rear
	Overall size of sieve(L X W), mm	:		
	Oscillation per minute corresponding to recommended no load field rpm	:		
	Lift/throw, mm	:		
	Arrangement for varying the opening of the sieve	:		
	Method of varying oscillation	:		
1.3.15.3.2	**Bottom sieve**			
	No. of sieve	:		
	Type	:		
	Overall size of sieve, (L XW) mm			
	Oscillation per minute corresponding to recommended no load field rpm	:		
	Arrangement for varying the opening of the sieve	:		
1.3.15.4	**Blower**			
	Dia. mm	:		
	Effective width, mm	:		
	No. & type of blade	:		
	Type of drive	:		
	Method of varying the blower speed	:		
	Range of Speed corresponding to recommended no load field rpm, rpm	:		
	Method of controlling the air blast	:		
1.3.15.5	**Grain pan**			
	Type	:		
	Size, mm	:		
	Inclination (degree) and method of adjustment if any	:		
1.3.15.6	**Tailing pan**			
	Type	:		
	Size, mm	:		
	Inclination, (degree) and method of	:		

	adjustment if any	
1.3.16	**Grain conveying mechanism**	
1.3.16.1	**Bottom grain conveyor**	
	Type	:
	Size of conveyor(length Dia. and Pitch), mm	
	Speed corresponding to recommended no load field rpm, rpm	:
1.3.16.2	**Grain elevator**	
	Type	:
	Length of elevator, mm	:
	Speed corresponding to recommended no load field rpm, rpm	:
	Elevator drive safety arrangement	:
	Method of tensioning the chain	:
1.3.16.3	**Upper grain auger**	
	Type	:
	Size of auger (Length, Dia. and Pitch), mm	:
	Speed corresponding to recommended no load field rpm , rpm	:
	Drive safety arrangement	:
1.3.17	**Tailing conveying mechanism**	
1.3.17.1	**Bottom tailing auger**	
	Type	:
	Size of auger(length, Dia. and pitch), mm	:
	Speed corresponding to recommended no load field rpm, rpm	:
	Drive safety	:
1.3.17.2	**Tailing elevator**	
	Type	:
	Length of elevator, mm	:
	Speed corresponding to recommended no load field rpm, rpm	
	Method of tensioning the chain	:
	Elevator drive safety arrangement	:
1.3.17.3	**Upper tailing auger**	
	Type	:
	Size(length, Dia. and Pitch), mm	:
	Speed corresponding to recommended no load field rpm, rpm	:
	Drive safety	:
1.3.18	**Grain tank**	
	Location	:
	Capacity	
	Volume basis, m^3 (With wheat)	:
	Provision of grain tank cover	:
	Provision for indication of grain tank filling	:
1.3.18.1	**Grain conveying auger (Bottom of grain tank)**	
	Type	:
	Size, mm	:
	Speed corresponding to recommended field	:

	operation rpm of engine, rpm			
	Safety device	:		
1.3.18.2	**Grain unloading auger**			
	Type	:		
	Size (length Dia. and pitch), mm	:		
	Horizontal reach, cm	:		
	Discharge height above ground level, cm	:		
	Clearance height, cm	:		
	Speed corresponding to recommended no load field rpm, rpm	:		
	Safety device	:		
1.4	**List of safety devices provided on the machine**			
1.5	**Details of Operating controls, gauges and instruments**			
1.6	**Seat**			
	Make	:		
	Type	:		
	Type of suspension	:		
	Type of dampening	:		
	Horizontal adjustment, mm	:		
	Adjustment of back rest, mm	:		
1.7	**Canopy**			
	Type	:		
	Canopy size, mm	:		
	Height from operator's platform, mm	:		
1.8	**Overall dimensions of combine harvester, cm**		**Working Position**	**Transport position**
	Length	:		
	Width	:		
	Height	:		
1.9	**Mass**			
	Mass of combine harvester with coolant, fuel, lubricants & grain tank (wheat) full and 75 kg mass on the operator's seat, kg			
	Total	:		
	Front	:		
	Rear	:		
1.10	**Ground clearance, mm**	:		
1.11	**Total number of lubricating points:**			
	Grease Nipples/grease holes	:		
	Greasing cups	:		
	Oiling	:		
1.12	**Header transport trailer**			
	Type	:		
	Size(LXWXH), mm	:		
	No. & type of wheel	:		
	Make	:		
	Size & Ply rating	:		
	Track width (mm)	:		
	Height of trailer hitch in transport	:		

	position, mm	
1.13	**Details of labelling plate**	**:**

2. STRAW CHOPPER CUM SPREADER (SMS) (IF FITTED)

2.1	**General**	
	Make of SMS	**:**
	Model of SMS	**:**
	Type of SMS	**:**
	Name and complete Address of the manufacturer of SMS including PIN/Mob./email etc.	**:**
2.2	**Rotor**	
	Rotor Diameter, mm	**:**
	No of lugs on rotar in a row	**:**
	No of rows in a periphery	**:**
	Width of flail, mm	**:**
	Thickness of flail, mm	**:**
	No. of flail in one set	**:**
	Spacing between flail of one set, mm	**:**
	Distance between adjacent flail unit, mm	**:**
	Rotor dia with blade, mm	**:**
	No of Rows/bar of serrated blade	**:**
	No of serrated blade in a row	**:**
	Spacing between serrated blades, mm	**:**
	Clearance between pivotal blade and concave	**:**
	Overlapping of pivotal blade on serrated blade, mm	**:**
	Rotor rpm	**:**
2.3	**Transmission**	**:**
	Diameter of Drive Pulley	**:**
	Diameter of Driven pulley	**:**
2.4	**Spreader**	
	Total no of flap, mm	**:**
	Length of flap, cm	**:**
	Distance between flaps(left to right)	**:**
	Spreader angle with horizontal, Degree	**:**
	Spreader angle with line of travel , degree	**:**
	Spreader sheet thickness, mm	**:**
	SMS sheet thickness, mm	**:**
2.5	**Overall dimensions (mm)**	
	Length	**:**
	Width	**:**
	Height	**:**
2.6	**Overall Mass (kg)**	**:**
2.7	**SAFETY REQUIREMENT FOR SMS**	:
	Guards over all moving parts	:
	RPM indicator of rotor	:

Overlapping of flail and fixed serrated blade (The clearance should be adjustable) :

2.10 Information provided on Labeling plate on SMS (details):

3 Lubricants:

Sl. No.	Particulars	As recommended by the applicant	Oil change period
1.	Engine oil		
2.	Hydraulic oil		
3.	Transmission and final drive housing oil		
4.	Hydrostatic steering oil		
5.	Grease		

SELECTED PERFORMANCE AND OTHER CHARACTERISTICS AS PER IS 15806-2018
TO BE DECLARED BY APPLICANT

S. No	Characteristics		Category (Evaluative/Non evaluative)	Requirement	Tolerance	Declarati-on by applicant	Remarks
1.	**Prime mover performance**						
	a)	Max. Power (absolute) Average max. power observed during 2 hrs. max. power test in natural ambient condition, kW	Evaluative	To be declared by manufacturer	Declared value to be achieved with a tolerance of ±5%		
	b)	Max. power observed during test after adjusting the no load engine speed as per recommendation of the manufacturer for field work, kW	Evaluative	To be declared by manufacturer	-do-		
	c)	Power at rated engine speed, kW (under natural ambient condition)	Non-Evaluative	To be declared by manufacturer	-do-		
	d)	Specific fuel consumption corresponding to average maximum power under 2h maximum power test, g/kWh.	Evaluative	-do-	+5%(Max.)		
	e)	Max. smoke density at 80% load between the speed at max. power & 55% of speed at max. or 1000 rpm whichever is higher	Evaluative	As pre CMV rules.	Nil	-	

	f)	Max. crank shaft torque, (Nm) observed during the test after no load engine speed is adjusted as per manufacture's recommendation for field work	Evaluative	To be declared by manufacturer	±8%		
	g)	Back up torque, %	Evaluative	7 percent, (Min.)	Nil	-	
	h)	Max. Operating temperature, 0C i) Engine oil	Evaluative	To be declared by manufacturer	Nil		The observed value under the high ambient condition should not exceed maximum safe value specified by the oil company which will be provided by the applicant
		ii) coolant	Evaluative	To be declared by manufacturer	Nil		The declared value should not exceed the boiling temperature of coolant under the pressurized or otherwise and the observed value under high ambient condition should not exceed the declaration
	i)	Lubrication oil consumption, g/kWh	Evaluative	Not exceeding 1 % of specific fuel consumption at maximum power under high ambient condition	Nil		The value should be based on the test conducted under high ambient condition
2.Brake performance at 24km/h or Maximum Speed whichever is less							
	a)	Max. Stopping distance at a force equal to or less than 600 N on brake pedal (m) – (cold brake and hot brake)	Evaluative	As pre CMV rules.	Nil		
	b)	Max. Force exerted on brake pedal to achieve a deceleration of 2.5 m/sec^2	Evaluative	≤ 600 N	Nil		
	c)	Effectiveness of parking brake at a force of 600 N at foot pedal or 400 N at Hand lever	Evaluative	As pre CMV rules.	Nil		Based on the test conducted, Yes/No as the case may be should be indicated

3.Mechanical vibration							
	i)	Operator's platform	Non evaluative	120 µm max.	Nil		
	ii)	Steering wheel	Non evaluative	150 µm max.	Nil		
	iii)	Seat with driver seated	Non evaluative	120 µm max.	Nil		
4.Air cleaner oil pull over							
	i)	Max. oil pull over in percentage when tested in accordance with IS: 8122. (Part-2)-2000	Evaluative	0.20% max.	Nil		
5.Noise measurement							
	i)	Max. ambient noise emitted by combine at by standards position dB (A)	Evaluative	as per CMVR	Nil		As per road transport condition
	ii)	Max. noise at operator's ear level dB (A)	Evaluative	as per CMVR	Nil		In actual field condition
6. Header Lifting Test							
		Satisfactory completion of header lifting test	Evaluative	Satisfactory completion	Nil		The observed Hydraulic oil temp should not exceed maximum safe value specified by the oil company which will be provided by the applicant.
7.Discard limit							
	a)	Cylinder bore diameter, mm	Evaluative	Should not exceed the values declared by the manufacture	Nil		
	b)	Piston diameter, mm	Evaluative	-do-	Nil		
	c)	Piston to cylinder liner clearance at skirt	Evaluative	-do-	Nil		
	d)	Ring end gap, mm	Evaluative	-do-	Nil		
	e)	Ring groove clearance, mm	Evaluative	-do-	Nil		
	f)	Diametrical clearance of big end bearing, mm	Evaluative	-do-	Nil		
	g)	Axial clearance of big end bearing, mm	Evaluative	-do-	Nil		
	h)	Diametrical clearance of main bearings, mm	Evaluative	-do-	Nil		
	i)	Axial clearance of main bearings, mm	Evaluative	-do-	Nil		
	j)	Thickness of brake lining	Evaluative	-do-	Nil		
	k)	Thickness of clutch plate	Evaluative	-do-	Nil		

	l)	Spring stiffness(N/mm)	-	-do-		Nil		
	m)	Clearance between valve and valve guide(mm)	-	-do-		Nil		
8.Field performance								
	a)	Suitability for crops	Evaluative	Wheat & paddy (Wheel type) Paddy (Track type)		Nil		
	b)	Processing losses (%)	Evaluative	Wheat Barley Rice Sorghum Maize Oil seed, rape Soya-beans	: : : : : : :	Max 3% Max 4% Max 4% Max 3% Max 4% Max 4% Max 5%	Nil	
	c)	Threshing efficiency	Evaluative	-	:	≥ 98 % for wheat and paddy	Nil	
	d)	Cleaning efficiency	Evaluative	-	:	≥ 96 % for wheat and paddy	Nil	
	e)	Grain breakage in main grain tank	Evaluative	-	:	≤ 2.5 %	Nil	
	f)	Non collectable losses	Evaluative	-	:	≤ 2.5 % for wheat, paddy and gram ≤ 4.0 % for soyabean	Nil	
9. Field performance for Straw Management System (If fitted)								
	a)	Uniformity of straw spread ,CV (Percent)	Evaluative	-	:	20, Max.	-	
	b)	Weighted mean size of chopped straw, cm	Evaluative	-	:	20,Max.	-	
10. Safety requirements								
	a)	Guards against all moving parts/drives and hot part	Evaluative	Belt and chain drives, pulleys hydraulic pipes(Around operators workplace)		--		As per IS 12239 (Part 1)
	b)	Lighting arrangement	Evaluative	essential as per CMVR		-		--
	c)	Grain tank cover	Evaluative	Essential		-		
	d)	Spark arrester in engine's exhaust in case naturally aspirated engine	Evaluative	Essential		-		
	e)	Stone trap before concave	Evaluative	Essential		-		
	f)	Rear view mirror	Evaluative	Essential		-		
	g)	Fire extinguisher	Evaluative	Essential		-		

	h)	Slip clutch at following drives – i) Cutting platform auger ii) Undershot conveyor drive iii) Grain & tailing elevator	 Evaluative Non evaluative Non evaluative	 Essential Optional Optional	-		
	i)	Anti slip surfaces at operator platform & ladder & proper gripping for the control levers.	Evaluative	Essential		--	As per IS 12239 (Part 1)
	j)	Working clearance around the controls	Evaluative	Essential 70mm, min	-		As per IS 12239 (Part 1)
	k)	Labelling of control and gauges and operating controls	Evaluative	Essential	**-**		As per IS 6283(Part 1)
11. Material of construction :							
		Guards, knife blades and knife back	Non evaluative	Conforming to IS 6024, IS 6025 and IS 10378 respectively	**-**	**-**	**-**
12.		Material of blades for Straw Management System (SMS)	Non-Evaluative	The flail and fixed blades shall be manufactured from steel having the following chemical composition or such other composition as shall be agreed between the supplier and the purchaser: a)Carbon : 0.70 to 0.1 % b)Manganese : 0.6 to 0.97 % c)Chrome : 0.1 % d)Nickle : 0.1 %			
13.		Bushes for flail blades	Non-Evaluative	Mild steel			
14.		Hardness of flail blades for Straw Management System (SMS)	Evaluative	Bush section : 20 to 35 HRC Edge section(Hardened zone) : 48 to 48 HRC Remainder zone: 20 to 35 HRC			
15.		Hardness of serrated blades for Straw Management System (SMS)	Evaluative	Bush section : 20 to 35 HRC Edge section(Hardened zone) : 48 to 58 HRC Remainder zone: 20 to 35 HRC			

16.		**Safety Requirements for Straw Management System(if Fitted)**				
	a)	Guards against all moving parts/drives and hot parts	Evaluative	Essential		
	b)	RPM indicator for rotor	Evaluative	Desirable		
	c)	Overlapping of flail and fixed serrated blades	Evaluative	Essential		The clearance of the flail and fixed serrated blades should be adjustable

Place:

Date:

Signature----------

Name of the applicant----------

Designation----------

Address----------
