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**GOVERNMENT OF INDIA**

**NORTHERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE**

**MIN. OF AGRI., (DEPTT. OF AGRI. AND CO-OPN.)**

**SIRSA ROAD, HISAR(Haryana)125001 fmti-nr@nic.in**

**COMBINE HARVESTER BRIEF TECHNICAL SPECIFICATION OF THE PRIMEOVER(ENGINE)**

**1.0 GENERAL:**

|  |  |  |
| --- | --- | --- |
| 1.1 | Name of manufacturer | : |
|  | Address of manufacturer | : |
|  | Telephone Number(s) | : |
|  | FAX Number(s) | : |
| 1.2 | Country of origin | : |

**2. Brief Technical Specification of engine:**

|  |  |  |
| --- | --- | --- |
| 2.1 | Make | : |
| 2.2 | Model | : |
| 2.3 | Type | : |
| 2.4 | Serial No. | : |
| 2.5 | Location | : |
| 2.6 | Method of mounting | : |
| 3. | Engine speed (Manufacturer’s | : |
|  | recommended setting): |  |
| 3.1 | Maximum at no load speed i.e high | : |
|  | idling speed (rpm) |  |
| 3.2 | Low idling speed (rpm) | : |
| 3.3 | Rated speed (rpm) | : |
| 3.4 | Speed at maximum torque (rpm) | : |

3.5 Speed recommended for field : work(mm)

|  |  |  |
| --- | --- | --- |
| 3.6 | Speed at maximum power (rpm) | : |
|  | Maximum power, kW(Ps) | : |

: 2 :

**4.Cylinders:**

|  |  |  |
| --- | --- | --- |
| 4.1 | Number | : |
| 4.2 | Disposition | : |
| 4.3 | Bore/Stroke (mm) | : |
| 4.4 | Capacity (cu. cm) | : |
| 4.5 | Compression ratio | : |
| 4.6 | Arrangement of valves | : |
| 4.7 | Type of cylinder liners | : |

4.8 Valve clearance (mm)(hot/cold):

|  |  |  |
| --- | --- | --- |
| - | Inlet | : |
| - | Exhaust | : |

**5.Fuel System:**(For Diesel Engines):

|  |  |  |
| --- | --- | --- |
| 5.1 | Type of fuel system | : |
| 5.2 | Make, model and type of fuel feed | : |
|  | pump |  |

5.3 Type, make and model of fuel : filters

|  |  |  |  |
| --- | --- | --- | --- |
| 5.4 | | No. of fuel filters | : |
| 5.5 | | Capacity of fuel tank(l) | : |
|  | 5.6 | Location of fuel tank | : |

5.7 Provision of draining for : sediment/water from fuel tank

|  |  |  |
| --- | --- | --- |
| 5.8 | Type, make and model of injection | : |
|  | pump. |  |
| 5.8.1 | Serial No. of fuel injection pump | : |

**5.8.2Diesel fuel injection pump setting:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Adjustment | | | | Final |  |  | |  | | Discharge | |  | Control | rod |
| operations | | | | injection |  |  | |  | |  |  |  | travel | in |
|  | | |  | pump | shaft | Qty. cc/ | | 100 | |  | Metering | tolerable | (mm) |  |
|  | | |  | speed (rpm) | | strokes | | or | |  | difference in strokes | |  |  |
|  | | |  |  |  | qm/ | | 100 | |  |  |  |  |  |
|  | | |  |  |  | strokes | |  | |  |  |  |  |  |
| At rated speed | | | |  |  |  | |  | |  |  |  |  |  |
| At | | | idling |  |  |  | |  | |  |  |  |  |  |
| speed | | |  |  |  |  | |  | |  |  |  |  |  |
| At full cut off | | | |  |  |  | |  | |  |  |  |  |  |
|  |  | | | | | : 3 : | |
| 5.9 | Fuel injectors | | | | | : | |
| 5.9.1 | Make | | | | | : | |
| 5.9.2 | Model | | | | | : | |
| 5.9.3 | Type | | | | | : | |
| 5.9.4 | Manufacturer’s production | | | | | : | |
|  | pressure setting, MPa(kg/cm2) | | | | |  | |
| 5.9.5 | Firing order | | | | | : | |
| 5.9.6 | Injection timing (degree) | | | | | : | |
|  | **For Gasoline Engines Only:** | | | | |  | |

5.10 Type, make and model of ignition : coil and distributor

5.11 T ype, make and model of : carburettor

|  |  |  |
| --- | --- | --- |
| 5.11.1 | Size of fuel jets | : |
| 5.11.2 | Ignition timing | : |

5.11.3Spark plugs:

|  |  |  |
| --- | --- | --- |
| - Make | | : |
| - | Model | : |
| - | Gap setting | : |

**6.Governor:**

|  |  |  |
| --- | --- | --- |
| 6.1 | Make | : |
| 6.2 | Model | : |
| 6.3 | Type | : |
| 6.4 | Range of engine speed (rpm) | : |
| 6.4 | Rated engine speed (rpm) | : |

**7.Pre-Cleaner:**

|  |  |  |
| --- | --- | --- |
| 7.1 | Make | : |
| 7.2 | Type | : |
| 7.3 | Location | : |

: 4 :

**8.Air-Cleaner:**

|  |  |  |
| --- | --- | --- |
| 8.1 | Make | : |
| 8.2 | Type | : |
| 8.3 | Number | : |

8.4 Oil capacity in case of oil bath : type (l)

8.5 Suction pressure at intake : manifold, kPa (mm of Hg)

|  |  |  |
| --- | --- | --- |
| 8.6 | Location | : |
| 8.7 | Recommended grade of oil | : |

8.8 Oil change period/dry filter : element change period (h)

**9.Lubrication System:**

|  |  |  |
| --- | --- | --- |
| 9.1 | Type | : |
| 9.2 | Type of oil pump | : |
| 9.3 | No. & type of oil filters | : |
| 9.4 | Capacity of lub oil sump (l) | : |

9.5Total capacity of lub oil (l)

9.6 Relief valve pressure setting, kPa : (kgf/cm2)

9.7 Minimum permissible pressure, :

|  |  |  |
| --- | --- | --- |
|  | kPa (kgf/cm2) |  |
| 9.8 | Recommended lubricating oil | : |
| 9.9 | Oil change period(h) | : |
| 9.10 | Method of oil cooling | : |
| **10** | **Cooling System:** |  |
| 10.1 | Type | : |
| 10.2 | Details of pump | : |
| 10.3 | Details of fan | : |
| 10.4 | Means of temperature control | : |

: 5 :

|  |  |  |
| --- | --- | --- |
| 10.5 | Total coolant capacity (l) | : |

10.6Radiator cap pressure, kPa :

|  |  |  |
| --- | --- | --- |
|  | (kgf/cm2) |  |
| 10.7 | Bare radiator capacity (l) | : |
| 10.8 | Maximum coolant temp.(oC) | : |

10.9Type of radiator grill

**11.Starting System:**

|  |  |  |
| --- | --- | --- |
| 11.1 | Type | : |
| 11.2 | Aids for cold starting | : |

11.3Any other device provided for : easy starting

|  |  |  |  |
| --- | --- | --- | --- |
| **12** | **Electrical System:** | |  |
| **12.1** | **Generator:** | |  |
|  | - Make | | : |
|  | - Model | | : |
|  | - | Serial No. |  |
|  | - | Type | : |
|  | - | Out put rating | : |

- Method of drive

**12.2Battery:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | - Make & model | | : |
|  | - | Type | : |
|  | - | Capacity and rating | : |
|  | - | No. of batteries | : |
|  | - | Location | : |
| **12.3** | **Starter:** | |  |
|  | - Make | | : |
|  | - Model | | : |
|  | - | Type | : |
|  | - Serial No. | | : |
|  | - Capacity | | : |

|  |  |  |
| --- | --- | --- |
| **12.4** | **Voltage Regulator:** | : 6 : |
|  |
|  | - Make | : |
|  | - Type | : |
|  | - Capacity & settings | : |

12.5**Horn:**

|  |  |  |
| --- | --- | --- |
| - Make | | : |
| - | Type | : |
| - | Location | :` |

13.**Exhaust:**

|  |  |
| --- | --- |
| -Type of silencer | : |

-Position of silencer outlet

-Provision for spark arresting device.

14**Special Features, If any:**

15**Overall Dimensions (Giving Sketch) :**

|  |  |  |
| --- | --- | --- |
|  | - Length | : |
|  | - Width | : |
|  | - Height | : |
| 16 | Total weight (with accessories) | : |
| 17. | Servicing schedule | : |
| 18. | Recommended list of oils used | : |

19.Initial settings and discard limits of following measurements:

|  |  |
| --- | --- |
| **Initial settings** | **Discard limits** |

Cylinder bore dia(mm) : Cylinder bore taperness and : ovality(mm)

|  |  |  |  |
| --- | --- | --- | --- |
| Piston dia at skirt | | | : |
| Piston to cylinder clearance at the | | | : |
| skirt(mm) | | |  |
| Piston rings end gap(mm): | | |  |
| - Top compression ring | | | : |
| - | | 2nd compression ring | : |
| - | | 3rd compression ring | : |
| - | | Oil rings | : |
|  | : 7 : | | **Initial settings** | |  | **Discard limits** | | |
| Piston ring groove clearance (mm) | | |  | | |  |  | | |
|  | | |  |  | | |
| - Top compression ring | | | : | | |  |  | | |
| - | 2nd compression ring | | : | | |  |  | | | |
| - | 3rd compression ring | | : | | |  |  | | | |
| - | Oil rings | | : | | |  |  | | | |
| Diametrical clearance of main : | | | | | |  |  | | | |
| bearings (mm) | | |  | | |  |  | | | |
| Crankshaft end float (mm) | | | : | | |  |  | | | |
| Clearance of big end bearings | | |  | | |  |  | | | |
| (mm): | | |  | | |  |  | | | |
| - | Axial | | : | | |  |  | | | |
| - | Diametrical | | : | | |  |  | | | |
| Clearance between valve guide | | | : | |  |  | |
| and stem (mm) | | |  | |  |  | |
| Spring index of valve springs | | |  | |  |  | |
| (kgf/mm): | | |  | |  |  | |
| Backlash between crown wheel & | | | : | |  |  | |
| pinion | | |  | |  |  | |
| Overall thickness of clutch plate | | | : | |  |  | |
| (mm) | | |  | |  |  | |
| Thickness of brake disc (mm) | | | : | |  |  | |

|  |  |
| --- | --- |
| Signature of Applicant | : |
| Name & Designation | : |
| Address: | : |
| Telephone No. | : |
| FAX No. | : |

Date:

|  |  |  |
| --- | --- | --- |
|  |  |  |

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**BRIEF TECHNICAL SPECIFICATION OF PRIME MOVER(TRACTOR)**

**1.0GENERAL:**

|  |  |  |
| --- | --- | --- |
| 1.1 | Name of tractor manufacturer | : |
|  | Address of manufacturer | : |
|  | Telephone Number(s) | : |
|  | FAX Number(s) | : |

1.2Place of running-in of the : tractor.

|  |  |  |
| --- | --- | --- |
| 1.3 | Duration of running-in | : |

**2.0Brief Technical Specification of Tractor:**

**2.1Agricultural Tractor:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Make | | | | : |
|  | Model | | | | : |
|  | Type | | | | : |
|  | Chassis Number | | | | : |
|  | Serial No. | | | | : |
|  | Maximum PTO power, kW : | | | | |
|  | (Ps) & rpm (declared value) | | | |  |
|  | Rated PTO power, kW (Ps) @ | | | | : |
|  | rpm (declared value) | | | |  |
|  | Whether tested in India earlier, | | | | : |
|  | if yes specify its test report | | | |  |
|  | Number with month & year of | | | |  |
|  | issue. | | | |  |
|  | Method of mounting | | | | : |
| **2.2** | **Engine:** | | | |  |
|  | Make | | | | : |
|  | Model | | | | : |
|  | Type | | | | : |
|  | Serial No. | | | | : |
|  | Engine speed (rpm) | | | | : |
|  | (Manufacturer’s recommended | | | |  |
|  | setting) | | | |  |
|  | : 2 : |
| Maximum speed at no load | : |
| (rpm) |  |
| Low idle speed (rpm) | : |
| Rated engine speed (rpm) | : |
| Engine speed recommended | : |
| for field work (rpm) |  |

**2.2.1Cylinders:**

|  |  |  |
| --- | --- | --- |
|  | Number(s) | : |
|  | Disposition | : |
|  | Bore/Stroke (mm) | : |
|  | Capacity (cc) | : |
| 2.2.2. | **Fuel system:** |  |
|  | Type of fuel system | : |
|  | Make, type and model of fuel | : |
|  | feed pump |  |
|  | Fuel tank capacity (l) | : |
|  | Number and type of filters | : |
|  | **Fuel Injection pump:** |  |
|  | Make | : |
|  | Type and model | : |
|  | **Fuel Injector:** |  |
|  | - Make | : |
|  | - Type and model | : |

-Manufacturer’s production :

pressure settings, MPa (kgf/cm2)

-Injection timing (degree)

**2.2.3Governor:**

|  |  |
| --- | --- |
| Make | : |
| Model | : |
| Type | : |

Governed range of engine :

|  |  |
| --- | --- |
| speed (rpm) |  |
| Rate of engine speed (rpm) | : |

: 3 :

**2.2.4Pre-cleaner:**

|  |  |  |
| --- | --- | --- |
|  | Make | : |
|  | Type | : |
|  | Number | : |
|  | Location | : |
| **2.2.5** | **Air-cleaner:** |  |
|  | Make | : |
|  | Type | : |
|  | Number | : |
|  | Location | : |
|  | Oil capacity (l) | : |
|  | Oil change period (h) | : |
|  | Recommended grade of oil | : |
| **2.26** | **Exhaust:** |  |
|  | Type of silencer | : |
|  | Position of silencer outlet | : |
|  | Provision of spark arresting | : |
|  | device (if any) |  |
| **2.2.7** | **Lubricating system:** |  |
|  | Type | : |
|  | Type and drive of pump | : |
|  | No. and type of oil filters | : |
|  | Capacity of oil sump (l) | : |
|  | Total lubricating oil capacity (l) | : |
|  | Lubricating oil change period (h) | : |
|  | Recommended grade of oil | : |
|  | Method of oil cooling, if any | : |
| **2.2.8** | **Cooling system:** |  |
|  | Type | : |
|  | Details of pump | : |
|  | Details of fan | : |
|  | Means of temperature control | : |
|  | Bare radiator capacity (l) | : |

: 4 :

|  |  |  |  |
| --- | --- | --- | --- |
| Total coolant capacity (l) | | | : |
| Radiator | cap | pressure, | : |
| kPa(kg/cm2) |  |  |  |
| Any other device for cooling | | | : |
| of engine during operation | | |  |

**2.2.9Starting system:**

|  |  |
| --- | --- |
| Type | : |

**2.2.9.1Starter motor:**

|  |  |
| --- | --- |
| Make | : |
| Model | : |
| Capacity | : |
| **2.2.9.2 Generator:** |  |
| Make | : |
| Model | : |
| Type | : |
| Output rating | : |

**2.2.9.3Battery:**

|  |  |  |
| --- | --- | --- |
|  | Make & model | : |
|  | Number and type | : |
|  | Capacity and rating | : |
| **2.2.9.4** | **Voltage regulator** | : |
| **2.2.10** | **Horn:** |  |
|  | Make | : |
|  | Type1 | : |
| **2.2.11** | **Operator’s seat:** |  |
|  | Make | : |
|  | Type | : |
|  | Horizontal adjustment (mm) | : |
|  | Vertical adjustment (mm) | : |

|  |  |
| --- | --- |
| Signature of Applicant | : |
| Name & Designation | : |
| Address: | : |
| Telephone No. | : |
| FAX No. | : |
| Date: |  |