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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: |   |