



**ESCORTS LIMITED, 434 DS  
(BRAND NAME - POWERTRAC) TRACTOR**



सत्यमेव जयते

भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय  
(कृषि, सहकारिता एवं किसान कल्याण विभाग)

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(DEPARTMENT OF AGRICULTURE, CO-OPERATION AND FARMERS WELFARE)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५

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T-1091/1616/2017

ESCORTS LIMITED , 434 DS (BRAND NAME : POWERTRAC)  
TRACTOR –Commercial (Variant)



Manufacturer

: M/s. Escorts Limited,  
Plot No. 2 & 3, Sector – 13  
FARIDABAD – 121 007  
HARYANA

Month: May

Test Report No.: T-1091/1616/2017

Year : 2017



GOVERNMENT OF INDIA  
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T-1091/1616/2017

**ESCORTS LIMITED , 434 DS (BRAND NAME : POWERTRAC)  
TRACTOR –Commercial (Variant)**

Type of Test : **COMMERCIAL (Variant)**  
 Test code/Procedure : IS: 5994-1998 (Reaffirmed in March 2009),  
 IS: 9253 (Reaffirmed in September, 2013),  
 and IS: 12207-2014.  
 Period of Test : March to April , 2017  
 Test Report No. : **1091/1616/2017**  
 Month/Year : **May,2017**

- i) The results reported in this report are observed values and no corrections have been applied for atmospheric and site conditions.
- ii) The data given in this report pertain to the particular machine submitted by the applicant for test.
- iii) The results presented in this report do not in any way attribute to the durability of the machine.
- iv) This report should not be reproduced in part or full without prior permission of the Director, Central Farm Machinery Training and Testing Institute, Budni (M.P.).
- v) **This is a Variant test report should be read in conjunction with the 1<sup>st</sup> Batch Test Report of base model i.e. "Escorts, Powertrac 434 Tractor" bearing report No. T- 792/1300/2011(September )**

| Sl. No | Units                 | Conversion Factor                |
|--------|-----------------------|----------------------------------|
| 1.     | <b>Force:</b>         |                                  |
|        | 1 kgf                 | 9.80665 N                        |
|        |                       | 2.20462 lbf                      |
| 2.     | <b>Power:</b>         |                                  |
|        | 1 hp                  | 1.01387metric hp (Ps)<br>745.7 W |
|        | 1 Ps                  | 735.5 W                          |
|        | 1 kW                  | 1.35962 Ps                       |
| 3.     | <b>Pressure:</b>      |                                  |
|        | 1 psi                 | 6.895 kPa                        |
|        | 1 kgf/cm <sup>2</sup> | 98.067 kPa = 735.56 mm of Hg     |
|        | 1 bar                 | 100 kPa = 10 N/cm <sup>2</sup>   |
|        | 1 mm of Hg            | 1.3332 m-bar                     |

| ABBREVIATIONS |                                    |
|---------------|------------------------------------|
| Apa           | As per applicant                   |
| TDC           | Top Dead Centre                    |
| IS            | Indian Standard                    |
| LHS/RHS       | Left Hand Side/<br>Right Hand Side |
| Hg            | Mercury                            |
| Temp.         | Temperature                        |
| N.R.          | Not recorded                       |
| Rpm           | Revolutions per minute             |
| O.D/I.D       | Outer diameter/<br>Inner diameter  |
| N.A.          | Not available/<br>Not applicable   |
| PTO           | Power take-off                     |
| R.H.          | Relative Humidity                  |

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|  |   |   |
|--|---|---|
| Manufacturer                           | : | M/s. Escorts Limited,<br>Plot No. 2 & 3, Sector - 13<br>FARIDABAD - 121 007<br>HARYANA                |
| Test requested by (applicant)          | : | The manufacturer  |
| Place of running-in & test carried out | : | At manufacturer work place  |
| Duration of said running-in (h):       | : |   |
| - Engine                               | : | 20  |
| - Transmission                         | : | 30  |
| Method of Selection                    | : | The tractor was submitted directly by the applicant for test. Hence method of selection is not known. |

### 1. SCOPE OF TEST

The "Escorts, Powertrac 434 Tractor" had undergone Initial Commercial Test at this institute and a Test Report Number T-538/1025/2005 was released in December, 2005. Subsequently the batch test on "Escorts, Powertrac 434" tractor undergone and test report was released vide No. T-792/1300/2011 in September, 2011.

The applicant having enclosed a list of following differences in the technical specifications between "Escorts, Powertrac 434 Tractor" Tractor and "Escorts limited, 434 DS (Brand Name: Powertrac) Tractor" Tractor and requested to test the "Escorts limited, 434 DS (Brand Name: Powertrac) Tractor" as a variant of "Escorts, Powertrac 434 Tractor".

The major features of Base model and Variant model are listed below:

| S. No. | Parameters   | Base Model<br>(T-792/1300/September,<br>2011) | Variant Model   |
|--------|--|---|---|
| 1      | 2  | 3   | 4   |
| 1.     | Make   | Escorts limited                               | Escorts limited   |
| 2.     | Model  | Powertrac 434                                 | 434 DS  |
| 3.     | Brand name   | None  | Powertrac   |
| 4.     | Engine Model                                       | E3.215-3A                                     | E3.215-3A   |
|        | Compression ratio, (apa)                           | 18.0 ± 5% : 1                                 | 17.5 ± 5% : 1   |
| 6.     | Capacity as specified by the applicant, (cc)       | 2146  | 2146  |
| 7.     | Make & model of fuel filter                        | Bosch, India &<br>9 450 030 120               | Bosch, India &<br>F 002 H20 187   |
| 8.     | Numbers of fuel filter                             | Two   | One   |
| 9.     | Make & model of fuel Injection pump                | F002 A0Z 730,<br>PES3A90D410RS3500            | F002 A0Z 941,<br>PES3A90D410RS2000  |
| 10.    | Make & model of fuel Injectors                     | Bosch, India &<br>F 002 C70 023 011           | Bosch, India &<br>F 002 C70 023 (Holder<br>no.), DSLA 144P 5586<br>(Nozzle no.) |
| 11.    | Injection timing                                   | 15 °±1 before TDC                             | 11 °±1 before TDC   |
| 12.    | Bare radiator capacity ,(l)                        | 3.50  | 2.80  |
| 13.    | Total coolant capacity,(l)                         | 7.55  | 6.5   |
| 14.    | Method of draft sensing                            | Through lower link                            | Through top link  |
| 15.    | Type of PTO shaft                                  | Type-II                                       | Type -I   |
| 16.    | PTO speed corresponding to rated engine speed, rpm | 1023 @ 2200 rpm                               | 660@2200 rpm  |



| 1   | 2   | 3                | 4                |
|-----|---|------------------|------------------|
| 17. | Type of Engine to PTO speed ratio               | 2.151:1          | 3.333:1          |
| 18. | Wheel base ,mm                                  | 1950             | 2010             |
| 19. | Overall dimension, (Length, Width & Height) ,mm | 3335,1685 & 2145 | 3190,1690 & 2170 |

Subsequent to the examination of the case in light of Indian Standard IS 12207-2014, the following tests were considered to be carried out:

- Specification checking
- Nominal speed test
- PTO performance test under natural ambient condition
- Field test (Dry land operation)

## 2. FUEL AND LUBRICANTS

2.1 Fuel : The High-speed diesel oil supplied by M/s Indian Oil Corporation Limited having density of 0.836 g/cc at 15°C was used.

### 2.2 Lubricants:

| S. No. | Particulars                    | As recommended by the manufacturer     | As used during the test                              |
|--------|--------------------------------|--|--|
| 1.     | Engine and Air cleaner oil     | SURAKSHA API CF -4 15W/40              | Oil originally filled in the tractor was not changed |
| 2.     | Transmission and hydraulic oil | SURAKSHA API CC SAE -20W/40            | Oil originally filled in the tractor was not changed |
| 3.     | Steering housing oil           | SAE 90(API GL-4, IS:1118-EP,TYPE-GL-4) | —do—   |
| 4.     | Grease                         | Ball bearing AP3 Grease                | Servo Grease MP                                      |

## 3. ESSENTIAL TESTS

### 3.1. SPECIFICATIONS

| 3.1.1 Tractor:   | Base model  | Variant model   |
|--|---|-----------------|
| Make   | Escorts Limited   | Escorts limited |
| Model  | POWERTRAC-434   | 434 DS          |
| Brand name   | None  | Powertrac       |
| Type   | Four wheeled, Rear-wheel driven, Standard Agricultural tractor.                   |                 |
| Year of manufacture  | 2011  | AE (April,2016) |
| Chassis Serial number  | B-3139673   | T053296440 AE   |
| Country of Origin  | India   | India           |
| 3.1.2 Engine:  |   |                 |
| Make   | Escorts Limited   | Escorts Limited |
| Model  | E3.215-3A   | E3.215-3A       |
| Type   | Four stroke, naturally aspirated, water, cooled, direct injection, diesel engine. |                 |
| Serial number  | E-3153773   | E-3333151       |
| <b>Engine speed (Manufacturer's recommended production setting)(rpm) :</b> |   |                 |
| - Maximum speed at no load   | 2475 to 2525  | 2475 to 2525    |
| - Low idle speed   | 600 to 650  | 600 to 700      |
| - Speed at maximum torque  | 1200 to 1300  | 1200 to 1300    |
| <b>Rated speed, (rpm):</b>   |   |                 |
| - For PTO use  | 2200  | 2200            |
| - For drawbar use  | 2200  | 2200            |



| 3.1.3 Cylinder & Cylinder Head:              |   | <u>Base model</u>                                       | <u>Variant model</u>                    |
|--|---|---|---|
| Number                                       | : | Three   | Three                                   |
| Disposition                                  | : | Vertical, Inline  | Vertical, Inline                        |
| Bore/stroke, (mm)                            | : | 91.0/110.0  | 91.0/110.0                              |
| Capacity as specified by the applicant, (cc) | : | 2146  | 2146                                    |
| Compression ratio, (apa)                     | : | 18.0 ± 5% : 1   | 17.5 ± 5% : 1                           |
| Type of cylinder head                        | : | Monoblock   | Monoblock                               |
| Type of cylinder liners                      | : | Wet, replaceable  | Wet, replaceable                        |
| Type of combustion chamber                   | : | Direct injection, open chamber in piston crown.         |   |
| Arrangement of valves                        | : | Overhead, inline  | Overhead, inline                        |
| <b>Valve clearance (cold/hot):</b>           |   |   |   |
| - Inlet valve, (mm)                          | : | 0.3 / 0.4   | 0.3 / 0.4                               |
| - Exhaust valve, (mm)                        | : | 0.3 / 0.4   | 0.3 / 0.4                               |
| <b>3.1.4 Fuel System:</b>                    |   |   |   |
| Type of fuel feed system                     | : | Gravity and forced feed                                 | Gravity and forced feed                 |
| <b>3.1.4.1 Fuel tank:</b>                    |   |   |   |
| Capacity, (l)                                | : | 45.0  | 51.5                                    |
| Location                                     | : | Above clutch housing                                    | Above clutch housing                    |
| Provision for draining of sediments/ water   | : | Not provided  | Not provided                            |
| Material of fuel tank                        | : | Metallic  | Metallic                                |
| <b>3.1.4.2 Water separator</b>               |   |   |   |
| Make   | : | Provided  | Provided                                |
| Type   | : | Hilux   | Hilux                                   |
| Location                                     | : | Sedimentation type with swirling motion.                | Sedimentation type with swirling motion |
|  | : | Provided between fuel tank and the fuel injection pump. | On RHS, In between fuel tank and FIP    |
| <b>3.1.4.3 Fuel feed pump:</b>               |   |   |   |
| Make   | : | Bosch, India  | Bosch, India                            |
| Type   | : | Plunger   | Plunger                                 |
| Model/Group combination No.                  | : | FP/KS22AD62, 9 440 030 029                              | FP/KS22AD62, 9 440 030 029              |
| Provision of sediment bowl                   | : | Provided  | Provided                                |
| Method of drive                              | : | Through timing gears                                    |   |
| <b>3.1.4.4 Fuel filters:</b>                 |   |   |   |
| Make   | : | Bosch, India  | Bosch, India                            |
| Model/Group combination No.                  | : | 9 450 030 120   | F 002 H20 187                           |
| Number                                       | : | Two   | One                                     |
| Type of elements                             | : |   |   |
| -Primary                                     | : | Cloth   | Paper                                   |
| -Secondary                                   | : | Paper   | Not applicable                          |
| Capacity of final stage filter, (l)          | : | 0.50  | 0.41                                    |
| <b>3.1.4.5 Fuel Injection pump:</b>          |   |   |   |
| Make   | : | Bosch, India  | Bosch, India                            |
| Model/Group combination No.                  | : | F 002 A0Z 730, PES3A90D410RS3500                        | F 002 A0Z 941 PES3A90D410RS2000         |
| Type   | : | Inline Plunger  | Inline Plunger                          |
| Serial number                                | : | 01241147  | 61949330                                |
| Method of drive                              | : | Through timing gears                                    |   |



|                |   | <u>Base model</u>   | <u>Variant model</u>   |
|----------------|---|---|--|
| <b>3.1.4.6</b> | <b>Fuel injectors:</b>  |   |  |
|                | Make  | : Bosch, India  | : Bosch, India   |
|                | Model/Group combination No.                                   | : F002 C70 023 011  | : F 002 C70 023<br>(Holder no.), DSLA 144P<br>5586 (Nozzle no) |
|                | Type  | : Multi hole (four holes)   | : Multi hole (four-holes)                                      |
|                | Manufacturer's production pressure setting, (MPa)             | : 24.5 to 25.3  | : 24.5 to 25.3   |
|                | Injection timing  | : 15 °±1 before TDC   | : 11 °±1 before TDC  |
|                | Firing order  | : 1 – 2–3   | : 1-2-3  |
| <b>3.1.4.7</b> | <b>Governor:</b>  |   |  |
|                | Make  | : Bosch, India  | : Bosch, India   |
|                | Model/Group combination No.                                   | : RSV325...1100A4C15<br>93L   | : RSV325...1100A4C1725L  |
|                | Type  | : Mechanical, centrifugal, variable speed   |  |
|                | Rated engine speed, (rpm)                                     | : 2200  | : 2200   |
|                | Governed range of engine speed (rpm)                          | : 600 to 2525   | : 600 to 2525  |
| <b>3.1.5</b>   | <b>Air Intake system:</b>                                     |   |  |
| <b>3.1.5.1</b> | <b>Pre-cleaner</b>  |   |  |
|                | Make  |   | : Escort (apa)   |
|                | Type  |   | : Centrifugal with transparent dust collector.                 |
|                | Location  |   | : Above main air cleaner inlet tube, outside the bonnet.       |
| <b>3.1.5.2</b> | <b>Air cleaner:</b>   |   |  |
|                | Make  | : Escorts(apa)  | : Escorts  |
|                | Type  | : Oil bath  | : Oil bath   |
|                | Location  | : In the front of the radiator , under the bonnet   |  |
|                | Oil capacity (l)  | : 1.0   | : 0.9  |
|                | Range of suction pressure at maximum power, (kPa)             | : 1.3 to 1.5  | : 3.5 to 3.6   |
|                | Oil change period   | : After every 50 hours of operation during normal working condition and after every 10 hours of operation in dusty condition. |  |
| <b>3.1.6</b>   | <b>Exhaust System:</b>  |   |  |
|                | Type of silencer  | : Updraft (Cylindrical)   | : Updraft (cylindrical)  |
|                | <b>Position of silencer outlet with respect to SIP, (mm):</b> |   |  |
|                | - Vertical  | : 970   | : 900  |
|                | - Longitudinal  | : 1400  | : 1565   |
|                | - Lateral   | : 350 (on LHS)  | : 340 (on LHS)   |
|                | Range of exhaust gas pressure at maximum power , (kPa)        | : 5.9 to 6.0  | : 5.9 to 6.3   |
|                | Provision of spark arrestor                                   | : None  | : None   |
|                | Provision against entry of rain water                         | : A bend is provided at the top of silencer.  |  |
| <b>3.1.7</b>   | <b>Lubricating system:</b>                                    |   |  |
|                | Type  | : Forced feed-cum-splash  | : Forced feed-cum-splash                                       |
|                | Oil sump capacity, ( l )                                      | : 5.75  | : 5.5  |
|                | Total lub oil capacity, ( l )                                 | : 6.50  | : 6.23   |
|                | Oil change period   | : First change after 100 hours of operation and subsequently after every 250 hours of operation.                              |  |
|                | Cooling device, (if any)                                      | : None  |  |





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**ESCORTS LIMITED , 434 DS (BRAND NAME : POWERTRAC)  
TRACTOR –Commercial (Variant)**

|  | <u>Base mode</u>  | <u>Variant model</u>             |
|--|---|----------------------------------|
| <b>Filters:</b>                              |   |                                  |
| Type   | Full flow, spin-on throw away, paper element.   |                                  |
| Number                                       | One   | One                              |
| <b>Pump:</b>                                 |   |                                  |
| Type   | Gear  |                                  |
| Method of drive                              | Through timing gears  |                                  |
| Pressure release setting, (kPa)              | 275 to 314  | 275 to 314                       |
| Minimum permissible pressure, (kPa)          | 98.1  | 98.1                             |
| <b>3.1.8 Cooling system:</b>                 |   |                                  |
| Type   | Forced circulation of water   |                                  |
| Coolant as recommended                       | Not available   | Not available                    |
| Details of pump                              | Centrifugal, semi open impeller of 75 mm diameter having eight vanes and driven through crankshaft pulley by a cogged "V-belt" common to alternator |                                  |
| Details of fan                               | Suction type, having six polypropylene blades of 381 mm diameter and mounted on water pump shaft.   |                                  |
| Means of temperature control                 | Thermostat  | Thermostat                       |
| Bare radiator capacity, ( l )                | 3.50  | 2.80                             |
| Total coolant capacity, ( l )                | 7.55  | 6.50                             |
| Radiator cap pressure,(kPa)                  | 49  | 49                               |
| <b>3.1.9 Starting System:</b>                |   |                                  |
| Type   | 12 V DC, Electrical   | 12 V DC, Electrical              |
| Aid for cold starting                        | None  | None                             |
| Any other device provided for easy starting. | None  | None                             |
| <b>3.1.10 Electrical System:</b>             |   |                                  |
| <b>3.1.10.1 Battery:</b>                     |   |                                  |
| Make & Model                                 | Exide , MF 70Z  | Exide , MF 70Z                   |
| Number                                       | One   | One                              |
| Type   | 12V, Lead Acid  | 12V, Lead Acid                   |
| Capacity and rating                          | 75 Ah at 20 hours discharge rate  | 70 Ah at 20 hours discharge rate |
| Location                                     | On LHS of flywheel housing in a separate metallic box.  |                                  |
| <b>3.1.10.2 Starter:</b>                     |   |                                  |
| Make   | Lucas –TVS  | Panalfa                          |
| Model  | M-14  | 155-0704                         |
| Type   | Pre-engaging solenoid operated  |                                  |
| Capacity and rating                          | 12V, 2.2 kW   | 12V, 2.2 kW                      |
| Serial Number                                | 26024035A   | Not available                    |
| <b>3.1.10.3 Generator:</b>                   |   |                                  |
| Make   | Lucas –TVS  | Autolek                          |
| Model  | A 115 36  | ALT4009H                         |
| Type   | Alternator  |                                  |
| Serial number                                | 26021467  | Not available                    |
| Output rating                                | 12V, 35 A @ of 6000 rpm   | 12V, 35 A @ of 6000 rpm          |
| Method of drive                              | Driven through crank shaft pulley by cogged V-belt common to water pump.  |                                  |
| <b>3.1.10.4 Voltage regulator</b>            | In built in alternator  |                                  |



7-025/1616/2017

**ESCORTS LIMITED , 434 DS (BRAND NAME : POWERTRAC)  
TRACTOR –Commercial (Variant)**

**3.1.10.5 Details of light:**

| Description                        | No. & capacity of bulbs           |                 | Height of the centre of beam above ground level, (mm) |               | Size of beam, (mm) |               | Distance between centre of the beam and outside edge of tractor at standard rear track setting, (mm) |               |
|------------------------------------|-----------------------------------|-----------------|---|---------------|--------------------|---------------|--|---------------|
|                                    | Base model                        | Variant model   | Base model  | Variant model | Base model         | Variant model | Base model   | Variant model |
| 1                                  | 2                                 | 3               | 4   | 5             | 6                  | 7             | 8  | 9             |
| <b>Front Lights:</b>               |                                   |                 |   |               |                    |               |  |               |
| -Head lights                       | 2, 12V, 40/45W                    | 02, 12V, 35/35W | 950   | 985           | 135 φ              | 125 φ         | 490  | 460           |
| -Parking lights                    | 2, 12V, 5W                        | 02, 12V, 5W     | 1245  | 1255          | 70 x 70            | 60 x 75       | 213  | 150           |
| -Turn Indicators-cum-Hazard lights | 2, 12V, 21W                       | 02, 12V, 21W    | 1245  | 1255          | 70 x 70            | 65 x 70       | 103  | 95            |
| -Reflectors (white)                | 2                                 | 02              | 1245  | 1255          | 60 x 40            | 60 x 40       | 158  | 195           |
| <b>Rear lights:</b>                |                                   |                 |   |               |                    |               |  |               |
| -Tail light-cum-brake light        | 2, 12V, 21/5W                     | 02, 12V, 21/5W  | 1255  | 1250          | 70 x 70            | 65 x 65       | 213  | 160           |
| -Turn Indicators-cum-Hazard lights | 2, 12V, 21W                       | 02, 12V, 21W    | 1255  | 1250          | 70 x 70            | 65 x 65       | 100  | 95            |
| -Plough light (on RHS mudguard)    | 1, 12V, 35W                       | 1, 12V,         | 1395  | 1410          | 120 φ              | 120 φ         | 355  | 305           |
| -Reflectors (Red)                  | 2 ( Red)                          | 02 (Red)        | 1245  | 1250          | 60 x 40            | 40 x 65       | 158  | 205           |
| Registration plate Light (RHS)     | Part of rear combination assembly |                 |   |               |                    |               |  |               |

**3.1.11 Instrument panel details:-**

|  | <u>Base model</u> | <u>Variant model</u> |
|--|-------------------|----------------------|
| i) Engine speed meter {analog type (0-25) x 100 rpm} | Provided          | Provided             |
| ii) Digital cumulative run hour meter                | Provided          | Provided             |
| iii) Coolant temperature gauge (with colour zones)   | Provided          | Provided             |
| iv) Fuel level gauge (with colour zones).            | Provided          | Provided             |
| v) Lubricating oil pressure indicator                | Provided          | Provided             |
| vi) Main switch (key-turn type)                      | Provided          | Provided             |
| vii) Light switch (Rotary type)                      | Provided          | Provided             |
| viii) Two way switch for turn indicators             | Provided          | Provided             |
| ix) Hazard light switch                              | Provided          | Provided             |
| x) Turn-cum-hazard indicator lights tell-tale        | Provided          | Provided             |
| xi) Battery charging warning indicator light         | Provided          | Provided             |
| xii) Head lamp (Long beam ) 'ON' indicator light     | Provided          | Provided             |
| xiii) Horn push button                               | Provided          | Provided             |
| xiv) Hand accelerator lever                          | Provided          | Provided             |
| xv) Steering control wheel                           | Provided          | Provided             |
| xvi) Engine stop knob                                | Provided          | Provided             |
| xvii) Rear view mirror.                              | Provided          | Provided             |

**ESCORTS LIMITED , 434 DS (BRAND NAME : POWERTRAC)  
TRACTOR –Commercial (Variant)**

|                 |   | <u>Base model</u>  | <u>Variant model</u>   |
|-----------------|---|--|--|
| <b>3.1.12</b>   | <b>Transmission System</b>                              |  |  |
| <b>3.1.12.1</b> | <b>Clutch:</b>  |  |  |
|                 | Make  | : Clutch Auto  | Clutch Auto  |
|                 | Type  | : Dry friction plate   | Dry friction plate   |
|                 | No. of friction plate, (s)                              | : One  | One  |
|                 | Size, (mm)  | : 279.0 φ / 165.5 φ  | 279.0 φ / 165.5 φ  |
|                 | Method of operation                                     | : By pressing the foot pedal provided on LHS of operator's seat  |  |
| <b>3.1.12.2</b> | <b>Gear box:</b>  |  |  |
|                 | Make  | : Escorts (apa)  | Escorts (apa)  |
|                 | Model   | : <b>Not Specified</b>   |  |
|                 | Type  | : Mechanical, Constant mesh gears  |  |
|                 | Gear shifting pattern (In case of base & variant model) |  |  |
|                 | Location of gear shifting levers                        | : Centre shifting, main & range selector lever provided in front of operator's seat.                   |  |
| <b>3.1.12.3</b> | <b>No. of speeds:</b>                                   |  |  |
|                 | - Forward   | : 08   | 08   |
|                 | - Reverse   | : 02   | 02   |
|                 | Oil capacity, (l)                                       | : 27.0 (Common with differential housing, rear axle and hydraulic system)                              | 36.0 (Common with differential housing, rear axle and hydraulic system)                  |
|                 | Oil changing period                                     | : First change after 150 hours and subsequently after every 600 hours of operation.                    |  |
| <b>3.1.12.4</b> | <b>Differential unit:</b>                               |  |  |
|                 | Type  | : Crown wheel & pinion with differential unit accommodated inside the differential housing.            |  |
|                 | Reduction through crown wheel and bevel pinion          | : 4.444 : 1 (40/9 T)   | 3.727 : 1 (41/11T)   |
|                 | Differential lock:                                      | : Not Provided   |  |
| <b>3.1.12.5</b> | <b>Rear axle &amp; final drive:</b>                     |  |  |
|                 | Type  | : Final reduction through bull gear and pinion accommodated inside the portal housing near rear wheel. | Final reduction through bull gear and pinion accommodated outside the rear axle housing. |
|                 | Reduction through final drive                           | : 3.750 : 1 (60/16 T)  | 4.428 : 1 (62/14T)   |
|                 | Oil capacity of final drive, (l)                        | : 1.00 (in each portal housing)  | 36.0 (common with differential housing, hydraulic system and gear box housing)           |
|                 | Oil changing period                                     | : First change after 100 hours and subsequently after every 250 hours of operation.                    | First change after 150 hours and subsequently after every 600 hours of operation.        |



|          |                                    |   |  |  |
|----------|------------------------------------|---|--|--|
| 3.1.13   | <b>Power lift:</b>                 |   | <u>Base model</u>  | <u>Variant model</u>   |
|          | Make                               | : | Escort (apa)   | Escort (apa)   |
|          | Type                               | : | Open centre, Live, ADDC  |  |
|          | No. and type of cylinder           | : | One, single acting   |  |
|          | Type of linkage lock for transport | : | Not provided   |  |
| 3.1.13.1 | <b>Hydraulic pump:</b>             |   |  |  |
|          | - Make                             | : | Rexorth  | Rexorth  |
|          | - Type                             | : | Gear   | Gear   |
|          | - Location & drive                 | : | On LHS of engine   |  |
|          | - Drive                            | : | Through timing gear  |  |
|          | No. & type of filters              | : | One, full flow, spin-on paper element.   | One, full flow, spin-on paper element.                         |
|          | Hydraulic oil capacity. ( l )      | : | 27.0 (Common with gearbox, rear axle and differential system).                                     | 36.0 (Common with gearbox, rear axle and differential system). |
|          | Oil change period                  | : | First change after 150 hours and subsequently after every 600 hours of operation.                  |  |
|          | Provision for external tapping     | : | Provided   | Provided   |
|          | Details of control levers          | : | i) Main control lever (Yellow)<br>ii) Selection lever (Black)<br>iii) External circuit lever (Red) |  |
|          | Method of draft sensing            | : | Through lower link   | Through top link   |
| 3.1.13.2 | <b>Three point linkage:</b>        |   |  |  |

| Sl. No. | Observations  | As per IS: 4468- (Part-1) -1997. (Cat.I / Cat.II), (mm) | As measured (mm) |               | Remarks in case of Variant model |
|---------|---|---|------------------|---------------|----------------------------------|
|         |   |   | Base model       | Variant model |                                  |
| 1       | 2   | 3   | 4                | 5             | 6                                |
| I.      | Upper hitch points:   |   |                  |               |                                  |
|         | a) Dia of hitch pin hole  | 19.30 to 19.50 / 25.70 to 25.90                         | 25.9             | 19.5          | Conforms to Cat.I&II             |
|         | b) Width of ball  | 44.0 (max.) / 51.0 (max)                                | 50.0             | 51.0          | Conforms to Cat.II               |
| II.     | Lower hitch points:   |   |                  |               |                                  |
|         | a) Dia of hitch pin hole  | 22.40 to 22.65 / 28.70 to 29.00                         | 28.84            | 28.88         | Conforms to Cat.II               |
|         | b) Width of ball  | 34.8 to 35.0 / 44.8 to 45.0                             | 45.0             | 45.0          | Conforms to Cat.II               |
| III.    | Lateral distance from lower hitch point to centre line of tractor.                                      | 359 / 435   | 364              | 364           | <b>Does not conform</b>          |
| IV.     | Lateral movement of lower hitch points  | 100 (min) / 125 (min)                                   | 190              | 160           | Conforms to Cat.I&II             |
| V.      | Distance from end of power take-off to centre of lower hitch point (lower links in horizontal position) | 450 to 575 / 550 to 625                                 | 555              | 540           | Conforms to Cat.I&II             |
| VI.     | Transport height  | 820 (min) / 950 (min)                                   | 820              | 855           | Conforms to Cat.I&II             |
| VII.    | Power range (without force)   | 560 (min) / 650 (min)                                   | 595              | 655           | Conforms to Cat.I                |
| VIII.   | Leveling adjustment   | 100 (min) / 100 (min)                                   | 300              | 195           | Conforms to Cat.I&II             |
| IX.     | Lower hitch point clearance   | 100 (min) / 100 (min)                                   | 150              | 170           | Conforms to Cat.I&II             |

**1.13.3 Linkage geometry dimensions [Refer Fig.-1(a)] (Variant Model):**

The following are dimensions observed, corresponding to 590 mm as tyre dynamic radius index:

| Sl. No. | Parameter   | Notation | Dimension or range, (mm) | Setting used during test, (mm) |
|---------|---|----------|--------------------------|--------------------------------|
| (1)     | (2)   | (3)      | (4)                      | (5)                            |
| 1.      | Length of lower link  | A        | 875                      | 875                            |
| 2.      | Length of lift arm  | B        | 385                      | 385                            |
| 3.      | Length of lift rods   | C        | 545 to 605               | 400                            |
| 4.      | Length of top link  | D        | 525 to 665               | 525                            |
| 5.      | Distance of lift rod connection point from pivot point of lower link. | E        | 355                      | 355                            |
| 6.      | Distance of lower link pivot point from rear wheel axis:              |          |                          |                                |
|         | -Horizontally   | F        | 105, behind              | 105, behind                    |
|         | -Vertically   | G        | 100, below               | 100, below                     |
| 7.      | Distance of upper link pivot point from rear wheel axis:              |          |                          |                                |
|         | -Horizontally   | H        | 330, behind              | 330, behind                    |
|         | -Vertically   | J        | 300, above               | 300, above                     |
| 8.      | Distance of lift arm pivot point from rear wheel axis:                |          |                          |                                |
|         | -Horizontally   | K        | 315, forward             | 315, forward                   |
|         | -Vertically   | L        | 425, above               | 425, above                     |
| 9.      | Height of lower hitch points relative to the rear wheel axis:         |          |                          |                                |
|         | - In high position  | M        | 150 to 265               | 390, above                     |
|         | - In low position   | N        | - 535 to 390             | 220, below                     |
| 10.     | Height of lower link hitch points when locked in transport position   |          | 245, above               |                                |

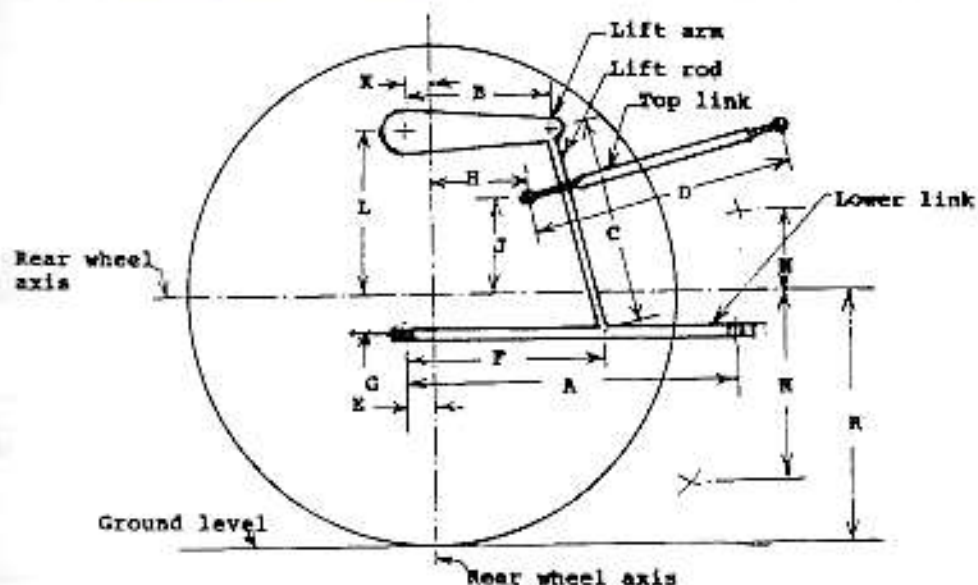


Fig. 1 (a): DIMENSIONAL NOTATIONS FOR TABLE OF LINKAGE GEOMETRY VARIANT MODEL



| 3.1.13.3 Drawbar:                              |  |                   |               |                                     |
|--|--|-------------------|---------------|-------------------------------------|
| 3.1.13.3.1 Linkage Drawbar [Refer Fig.1 (b)] : |  |                   |               |                                     |
| Notation                                       | As per IS: 12953-1990,<br>(Cat.I) / (Cat.II), (mm) | As measured, (mm) |               | Remarks in case<br>of variant model |
|  |  | Base model        | Variant model |                                     |
| A  | 683 ± 1.5 / 825 ± 1.5                              | 684               | 683           | Conforms to cat-I                   |
| B  | 75 (min) / 75 (min)                                | 75.7              | 75.2          | Conforms to cat I, II               |
| C  | 30 (min) / 30 (min)                                | 32.0              | 30.3          | Conforms to cat I, II               |
| D $\varnothing$                                | 21.79 to 22.00 /<br>27.79 to 28.00                 | 28.0              | 28.0          | Conforms to cat-II                  |
| E  | 39.0 (min) / 49.0 (min)                            | 61.0              | 57.2          | Conform cat I & II                  |
| F $\varnothing$                                | 12.0 (min) / 12.0 (min)                            | 12.0              | 12.0          | -- do --                            |
| G  | 15.0 (min) / 15.0 (min)                            | 15.5              | 15.0          | -- do --                            |
| H $\varnothing$                                | 25 ± 1 / 25 ± 1                                    | 25.0              | 24.4          | -- do --                            |
| J  | 80 ± 1.5 / 80 ± 1.5                                | 80.0              | 79.7          | -- do --                            |
| No. of<br>holes                                | 7 / 9  | 07                | 07            | Conform to cat- I                   |

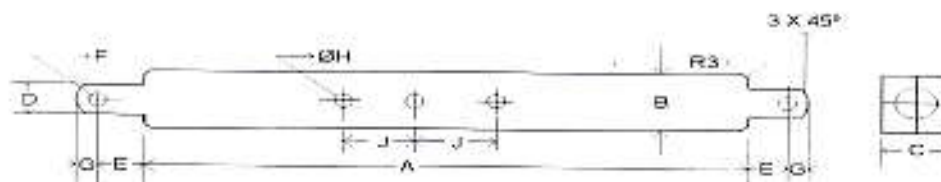


Fig. 1(b): DIMENSIONAL NOTATIONS FOR LINKAGE TYPE DRAWBAR

|            |   |   |   |                         |
|------------|---|---|---|-------------------------|
| 3.1.13.3.2 | Swinging drawbar                                      | : | Not provided  |                         |
| 3.1.14     | Power take-off shaft:                                 |   | <u>Base model</u>                                   | <u>Variant model</u>    |
|            | Type  | : | Type-II, Not Independent                            | Type-I, Not Independent |
|            | Method of engaging                                    | : | By a hand lever provided on LHS of operator's seat. |                         |
|            | No. of shaft,(s)                                      | : | One   | One                     |
|            | PTO speed corresponding to rated engine speed, (rpm): | : | 1023  | 660                     |
|            | Distance behind rear axle, (mm)                       | : | 200   | 320                     |
|            | Engine to PTO speed ratio                             | : | 2,150 : 1   | 3,333 : 1               |

## 3.1.14.1 Specifications of Power Take-Off Shaft:

| Specification           | As per IS: 4931-1995<br>(Type-I & II) |            | As observed  |   | Remarks<br>in case of<br>variant<br>model |
|-------------------------|---------------------------------------|------------|--|---|---|
|                         | 2                                     | 3          | 4  | 5   |   |
| 1                       | 2                                     | 3          | 4  | 5   | 6   |
| Nominal speed,<br>(rpm) | 540 ± 10                              | 1000 ± 25/ | 1000 rpm of<br>PTO<br>corresponds<br>to 2151 rpm<br>of engine. | 540 rpm of<br>PTO<br>corresponds to<br>1801 rpm of<br>engine. | Conforms                                  |
| No. of splines          | 6                                     | 21         | 21   | 6   | Conforms                                  |
| Direction of rotation   | Clockwise                             | Clockwise  | Clockwise  | Clockwise   | Conforms                                  |

| 1                               | 2   | 3                        | 4                                 | 5                                 | 6        |
|---------------------------------|---|--------------------------|-----------------------------------|-----------------------------------|----------|
| Location                        | The position of the centre of the end of pto shaft shall be within 50mm to right or left of the centre line of the tractor. |                          | In the centre line of the tractor | In the centre line of the tractor | Conforms |
| Dimensions, (mm) [See Fig.2(a): |   |                          |                                   |                                   |          |
| D $\phi$                        | 34.79 $\pm$ 0.06  | 34.67 $\pm$ 0.20         | 34.63                             | 34.80                             | Conforms |
| d $\phi$                        | 28.91 $\pm$ 0.05  | 31.1 (min)               | 31.2                              | 28.90                             | Conforms |
| B $\phi$                        | 29.4 $\pm$ 0.1  | 29.35 $\pm$ 0.05         | 29.33                             | 29.36                             | Conforms |
| A $\phi$ (optional)             | 8.3 $\pm$ 0.1   | N.A.                     | N.A.                              | 8.22                              | Conforms |
| W                               | 8.69 - 0.09/<br>- 0.16  | 2.494 - 0.125<br>- 0.188 | 2.368                             | 8.62                              | Conforms |
| a                               | 7   | 5                        | 5                                 | 7                                 | Conforms |
| b (optional)                    | 25 $\pm$ 0.5  | N.A.                     | N.A.                              | 24.66                             | Conforms |
| c                               | 38  | 25.5                     | 25.5                              | 38                                | Conforms |
| X                               | 30 <sup>c</sup>   | 30 <sup>d</sup>          | 30 <sup>u</sup>                   | 30 <sup>u</sup>                   | Conforms |
| B                               | 76 (min)  | 64 (min)                 | 70                                | 80                                | Conforms |
| h                               | 450 to 675  | 550 to 775               | 525                               | 525                               | Conforms |

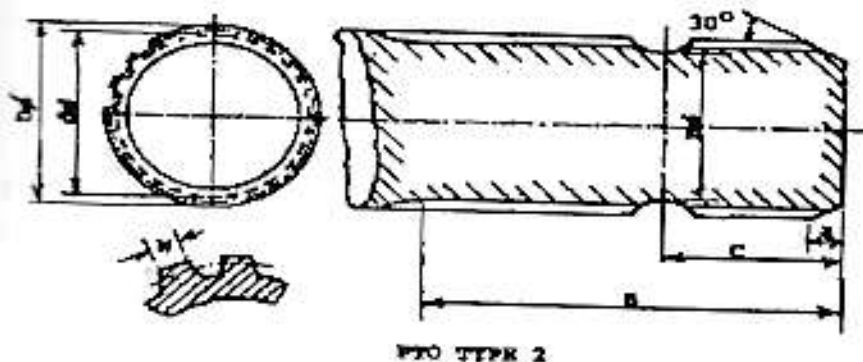
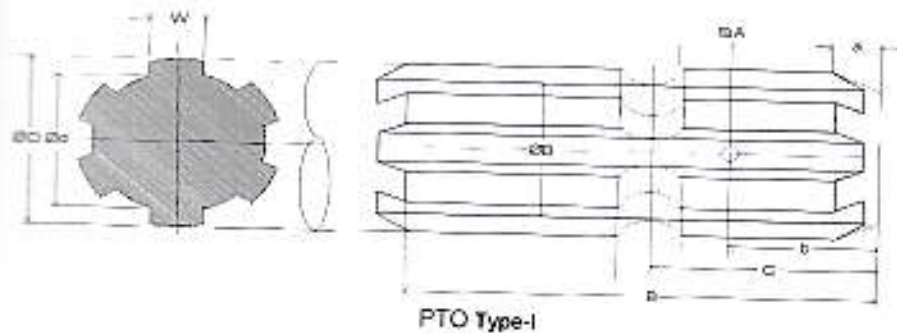


Fig.2 (a): DIMENSIONAL NOTATIONS FOR TYPE-I & II POWER TAKE-OFF SHAFT

1.14.2 Master Shield of Power Take-Off Shaft: Not provided



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**ESCORTS LIMITED , 434 DS (BRAND NAME : POWERTRAC)  
TRACTOR –Commercial (Variant)**

|                 |   | <u>Base model</u>  | <u>Variant model</u>  |
|-----------------|---|--|---|
| <b>3.1.15</b>   | <b>Towing hitch:</b>                        |  |   |
| <b>3.1.15.1</b> | <b>Front</b>                                |  |   |
|                 | Type  | Clevis   | Clevis  |
|                 | Location                                    | At front of tractor<br>below the bumper  | At front of tractor   |
|                 | Height above ground level, (mm)             | 560  | 660   |
|                 | Type of adjustment                          | Fixed  | Fixed   |
|                 | Dia of pin hole, (mm)                       | 19.6   | 35.3  |
|                 | Width of clevis, (mm)                       | 58.2   | 59.8  |
| <b>3.1.15.2</b> | <b>Rear</b>                                 |  |   |
|                 | Type  | Clevis   | Clevis  |
|                 | Location                                    | At rear of transmission housing  |   |
|                 | Height above ground level, (mm):            |  |   |
|                 | - Maximum                                   | 680 (Fixed)  | 685   |
|                 | - Minimum                                   | None   | 475   |
|                 | - No. of positions                          | None   | 8   |
|                 | - Type of adjustment                        | None   | By changing the<br>position of hitch<br>& reversing hitch on<br>its mounting bracket. |
|                 | <b>Distance of hitch point, (mm):</b>       |  |   |
|                 | -From rear wheel centre                     | 365  | 440   |
|                 | -From power take-off shaft end              | 165  | 130   |
|                 | Dia of pin hole, (mm)                       | 28.5   | 34.0  |
|                 | Width of clevis, (mm)                       | 75.7   | 73.8  |
| <b>3.1.16</b>   | <b>Steering:</b>                            |  |   |
|                 | Make  | ZF   | Rane  |
|                 | Type  | Mechanical, recirculating balls and nut type<br>with single drop arm.                  |   |
|                 | Location of control wheel                   | Above gear box housing.  |   |
|                 | Method of operation                         | Manually, through steering control wheel.  |   |
|                 | Diameter of steering control wheel,<br>(mm) | 460  | 460   |
|                 | Steering oil capacity, (l)                  | 0.60   | 0.60  |
|                 | Lubricant change period                     | First change after 150 hours and<br>subsequently after every 850 hours of<br>operation |   |
| <b>3.1.17</b>   | <b>Brakes:</b>                              |  |   |
| <b>3.1.17.1</b> | <b>Service Brake:</b>                       |  |   |
|                 | Make  | TVS Girling  |   |
|                 | Type  | Mechanical, dry disc brake.  |   |
|                 | Location                                    | On rear half axle<br>shaft, before final<br>reduction unit.                            | On rear half axle<br>shaft, after final<br>reduction unit.                            |
|                 | No. of disc(s)                              | Two (on each wheel side)   |   |
|                 | Area of liners, (cm <sup>2</sup> )          | 611.1 (on each wheel side)   |   |
|                 | Material of liners                          | Asbestos (apa)   |   |
|                 | Method of operation                         | Independent or combined pedal operation by<br>right foot.                              |   |





|  | <u>Base model</u>   | <u>Variant model</u>                       |
|--|---|--|
| <b>3.1.17.2 Parking Brake:</b>   |   |  |
| Type   | : Pawl & ratchet arrangement for locking service brakes.  |  |
| Location & Method of operation   | : Services brake act as parking brake when locked in position by a hand lever provided on right hand side of operator seat. |  |
| <b>3.1.18 Wheel Equipment:-</b>  |   |  |
| <b>3.1.18.1 Steering Wheel(s):</b>   |   |  |
| Make   | : Good Year   | Good Year                                  |
| Number(s)  | : Two   | Two  |
| Type of tyre   | : Pneumatic, ribbed   | Pneumatic, ribbed                          |
| Size   | : 6.00-16   | 6.00 -16                                   |
| Ply rating   | : 8   | 8  |
| Maximum permissible loading capacity of each tyre at 196 kPa pressure, (kgf) | : 410   | 406  |
| <b>Recommended inflation pressure, kPa :</b>                                 |   |  |
| - for field work   | : 196   | 196  |
| - for transport  | : 196   | 196  |
| Track width, (mm)  | : 1195 (std) & 1440   | 1350 (std) & 1550                          |
| Method of changing track width   | : By reversing the wheel discs  | By reversing the wheel discs.              |
| Make & size of rims  | : Wheels India & 4.50 E x 16  | SSWL & 4.50 E x 16                         |
| <b>3.1.18.2 Drive wheel (s) :</b>  |   |  |
| Make   | : Good Year   | Good Year                                  |
| Number   | : Two   | Two  |
| Type of tyre   | : Pneumatic, traction   | Pneumatic, traction                        |
| Size   | : 12.4 - 28   | 12.4 – 28                                  |
| Ply rating   | : 12 PR   | 12 PR                                      |
| Maximum permissible loading capacity of each tyre at 108 kPa pressure, (kgf) | : 1030  | 1030                                       |
| <b>Recommended inflation pressure, (kPa):</b>                                |   |  |
| - For field work   | : 100   | 100  |
| - For transport  | : 108   | 108  |
| Track width, (mm)  | : 1345(std), 1435, 1555, 1585, 1695, 1785 & 1895  | 1250,1360(std),1450, 1560,1710 ,1770 &1890 |
| Make & size of wheel rim   | : Wheels India & W 11 x 28  |  |
| <b>3.1.18.3 Wheel base, (mm)</b>   | : 1950  | 2010                                       |
| Method of changing wheel base, if any, and range                             | : None  | None                                       |
| <b>3.1.19 Operator's seat:</b>   |   |  |
| Make   | : Not Specified   | SIETZ                                      |
| Type   | : Cushioned with back rest  |  |
| Type of Suspension   | : Two helical coil springs  |  |
| Type of Damping  | : Hydraulic shock absorber  |  |
| <b>Range of adjustment, (mm):</b>  |   |  |
| Vertical   | : Nil   | Nil  |
| Lateral  | : Nil   | Nil  |
| Longitudinal   | : ± 30  | ±65  |



|          |  |  |  |
|----------|--|--|--|
| 3.1.20   | <b>Provision for safety and comfort of operator:</b>   |  |  |
| 3.1.20.1 | <b>Operator's Seat:</b>  |  |  |
|          | Meets the minimum requirements of IS: 12343-1998, (Re-affirmed in March, 2009) except the following:                         |  |  |
|          | <u>Base model</u>  | <u>Variant model</u>   |  |
|          | i) Longitudinal adjustment forward & rearward from the mid position.   | i) Longitudinal distance from SIP to centre of steering control wheel.           |  |
| 3.1.20.2 | <b>Conformity with IS: 6283 (Part 1 &amp; 2)-1998 (Re-affirmed in March, 2009) :</b>   |  |  |
|          | Controls and displays are identifiable with symbols meets the requirements as per IS : 6283 (Part 1&2) – 1998                |  |  |
|          | <u>Base model</u>  | <u>Variant model</u>   |  |
|          | i) Meets the minimum requirements  | i) Meets the minimum requirements  |  |
| 3.1.20.3 | <b>Conformity with IS : 8133-1983 (Re-affirmed in March, 2009) :</b>   |  |  |
|          | Location and movement of various controls meets the requirement of IS : 8133-1983, except the following:                     |  |  |
|          | <u>Base model</u>  | <u>Variant model</u>   |  |
|          | i) Provision of safety against accidental start of engine has not been provided.   | i) Provision of safety against accidental start of engine has not been provided. |  |
|          |  | ii) The fuel shut-off lever does not remain in stop position                     |  |
| 3.1.20.4 | <b>Conformity with IS:12239 (Part-1)-1996 (Re-affirmed in March,2007) :</b>  |  |  |
|          | Meets the requirements of IS: 12239 (Part-1) – 1996, except the following:   |  |  |
|          | <u>Base model</u>  | <u>Variant model</u>   |  |
|          | i) The spark arrester has not been provided in the exhaust system.   | i) The spark arrester has not been provided in the exhaust system.               |  |
|          | ii) Provision of vertical retainers at both sides of clutch pedal & brake pedal  | ii) Width of step does not meet the requirement.                                 |  |
| 3.1.20.5 | <b>Conformity with IS:12239 (Part-2)-1999 (Re-affirmed in March,2009) :</b>  |  |  |
|          | Meets the requirements of IS:12239 (Part-2)-1999, except the following:  |  |  |
|          | <u>Base model</u>  | <u>Variant model</u>   |  |
|          | i) Working clearance between external circuit lever & mudguard does not meet the requirement of the above referred standard. | i) Provision of PTO master shield has not been provided                          |  |
|          | ii) Transport lock in the hydraulic system has not been provided   | ii) Transport lock in the hydraulic system has not been provided                 |  |
|          | iii) Hydraulic oil pressure pipe line has not been guarded properly  |  |  |
| 3.1.21   | <b>Mass of tractor, (kg):</b>  | <b>Unballasted</b>   | <b>Unballasted</b>                     |
|          | - Front :  | 685  | 630                                    |
|          | - Rear :   | 1055   | 1120                                   |
|          | - Total :  | 1740   | 1750                                   |
| 3.1.22   | <b>Over all dimensions:</b>  |  |  |
|          | - Length :   | 3335   | 3190                                   |
|          | - Width :  | 1685   | 1690                                   |
|          | - Height (with exhaust pipe) :   | 2145   | 2170                                   |
|          | Minimum ground clearance, (mm) :   | 390 (below transmission housing drain plug)                                      | 377(below transmission oil drain plug) |



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**ESCORTS LIMITED , 434 DS (BRAND NAME : POWERTRAC)  
TRACTOR –Commercial (Variant)**

3.1.23

**Labelling of tractor:**

The labelling plate riveted on LHS of the front axle support provides the following information:

|  |   |  |
|--|---|--|
| Name of Manufacturer                     | : | M/s. ESCORTS LIMITED<br>(AGRI MACHINERY GROUP) |
| Make                                     | : | ESCORTS LIMITED                                |
| Model                                    | : | 434 DS   |
| Brand Name                               | : | Powertrac                                      |
| Year of manufacture                      | : | AE i.e. April,2016                             |
| Engine Serial Number                     | : | E3333151                                       |
| Chassis Serial Number                    | : | T053298440AE                                   |
| Maximum PTO Power, kW (hp)               | : | 23.5 (31.5)                                    |
| Specific fuel consumption, gm/kWh(g/hph) | : | 235  |

3.1.24

**Number of external lubricating points:**

|                  |   |     |     |
|------------------|---|-----|-----|
| - Oiling         | : | Nil | Nil |
| - Grease cups    | : | 02  | 02  |
| - Grease nipples | : | 23  | 14  |

3.1.25

**Colour of tractor:**

|                  |   |           |           |
|------------------|---|-----------|-----------|
| Chassis & engine | : | Black     | Black     |
| Sheet metal:     | : | Blue      | Blue      |
| Mudguard & Rim   | : | Off white | Off white |

**3.2 NOMINAL SPEED TEST**

| Movement | Gear No. | No. of engine revolutions for one revolution of driving wheel |               | Nominal speed at rated engine speed when fitted with 12.4-28 tyre size with 590 mm radius index,kmph |               | Variation in nominal speed (%) |
|----------|----------|---|---------------|--|---------------|--------------------------------|
|          |          | Base model  | Variant model | Base model   | Variant model |                                |
| Forward  | L1       | 182.16  | 193.4         | 2.69   | 2.53          | -5.9                           |
|          | L2       | 131.17  | 128.9         | 3.73   | 3.79          | 1.6                            |
|          | L3       | 82.64   | 83.7          | 5.92   | 5.84          | -1.4                           |
|          | L4       | 51.75   | 51.6          | 9.46   | 9.48          | 0.2                            |
|          | H1       | 58.94   | 61.1          | 8.30   | 8.0           | -3.6                           |
|          | H2       | 42.26   | 41.2          | 11.58  | 11.88         | 2.6                            |
|          | H3       | 26.63   | 27.0          | 18.37  | 18.09         | -1.5                           |
|          | H4       | 16.66   | 16.7          | 29.37  | 29.22         | -0.5                           |
| Reverse  | RL       | 140.76  | 155.7         | 3.48   | 3.14          | -9.8                           |
|          | RH       | 45.27   | 49.9          | 10.81  | 9.79          | -9.4                           |

**3.3 PTO PERFORMANCE TEST**

| S. No. | Particulars                                 | Base model              | Variant model         |
|--------|---|-------------------------|-----------------------|
| 1      | Date(s) of test                             | 28.03.2011 , 29.03.2011 | 24.03.2017            |
| 2      | Tractor run prior to start of PTO test, (h) | 57.3                    | 0.50                  |
| 3      | Dynamometer test bench used                 | Eddy Current, ESF 1000S | SAJ-200 Eddy current. |

Power take-off performance test under natural ambient condition test was conducted due to change in Engine to PTO speed ratio. The results of Power take-off performance test under natural ambient of Base & Variant Model are tabulated in Table-1.



Table-1

| Model  | Power, (kW) | Speed, (rpm) |        | Fuel Consumption |        |          | Specific energy, (kWh/l) |
|--|-------------|--------------|--------|------------------|--------|----------|--------------------------|
|  |             | PTO          | Engine | (l/h)            | (kg/h) | (kg/kWh) |                          |
| 1  | 2           | 3            | 4      | 5                | 6      | 7        | 8                        |
| <b>a) Maximum power – 2 hours test (under natural ambient condition):</b>  |             |              |        |                  |        |          |                          |
| Base model   | 24.1        | 1023         | 2199   | 6.89             | 5.76   | 0.239    | 3.50                     |
|  | 23.2        | 1023         | 2199   | 6.63             | 5.54   | 0.239    | 3.50*                    |
| Variant model  | 24.1        | 676          | 2252   | 7.03             | 5.88   | 0.245    | 3.41                     |
| <b>b) Power at rated engine speed (2200 rpm):</b>  |             |              |        |                  |        |          |                          |
| Base model   | 24.1        | 1023         | 2199   | 6.89             | 5.76   | 0.239    | 3.50                     |
|  | 23.2        | 1023         | 2199   | 6.63             | 5.54   | 0.239    | 3.50*                    |
| Variant model  | 23.5        | 660          | 2198   | 6.81             | 5.69   | 0.242    | 3.46                     |
| <b>c) Power at standard power take-off speed (1000 ± 25 &amp; 540 ± 10 rpm):</b>   |             |              |        |                  |        |          |                          |
| Base model   | 23.5        | 1000         | 2150   | 6.64             | 5.55   | 0.236    | 3.54                     |
|  | 22.4        | 1000         | 2150   | 6.42             | 5.37   | 0.240    | 3.49*                    |
| Variant model  | 20.4        | 539          | 1798   | 5.75             | 4.81   | 0.236    | 3.54                     |
| <b>d) Varying loads at rated engine speed:</b>   |             |              |        |                  |        |          |                          |
| <b>i) Torque corresponding to maximum power available at rated engine speed:</b>   |             |              |        |                  |        |          |                          |
| Base model   | 24.1        | 1023         | 2199   | 6.89             | 5.76   | 0.239    | 3.50                     |
| Variant model  | 23.5        | 660          | 2198   | 6.81             | 5.69   | 0.242    | 3.46                     |
| <b>ii) 85% of the torque obtained in (i):</b>  |             |              |        |                  |        |          |                          |
| Base model   | 22.8        | 1142         | 2455   | 6.89             | 5.76   | 0.253    | 3.31                     |
| Variant model  | 22.0        | 728          | 2425   | 6.65             | 5.56   | 0.253    | 3.31                     |
| <b>iii) 75% of the torque obtained in (ii):</b>  |             |              |        |                  |        |          |                          |
| Base model   | 17.1        | 1142         | 2455   | 5.47             | 4.57   | 0.267    | 3.13                     |
| Variant model  | 16.7        | 734          | 2444   | 5.31             | 4.44   | 0.266    | 3.15                     |
| <b>iv) 50% of the torque obtained in (ii):</b>   |             |              |        |                  |        |          |                          |
| Base model   | 11.5        | 1145         | 2462   | 4.20             | 3.51   | 0.305    | 2.74                     |
| Variant model  | 11.2        | 740          | 2463   | 4.14             | 3.46   | 0.309    | 2.71                     |
| <b>v) 25% of the torque obtained in (ii):</b>  |             |              |        |                  |        |          |                          |
| Base model   | 5.8         | 1147         | 2466   | 3.00             | 2.51   | 0.433    | 1.93                     |
| Variant model  | 5.6         | 746          | 2485   | 2.99             | 2.50   | 0.444    | 1.88                     |
| <b>w) Unloaded:</b>  |             |              |        |                  |        |          |                          |
| Base model   | 2.1         | 1152         | 2477   | 2.32             | 1.94   | 0.924    | 0.91                     |
| Variant model  | 0.0         | 751          | 2501   | 1.95             | 1.63   | 54.333   | 0.02                     |
| <b>e) Varying loads at standard PTO speed (1000 ± 25 rpm): Base Model</b>  |             |              |        |                  |        |          |                          |
| The varying load at standard PTO speed was not conducted as the maximum PTO power of tractor was observed at 1023 PTO rpm, which is within the range of standard PTO speed of 1000±25. |             |              |        |                  |        |          |                          |

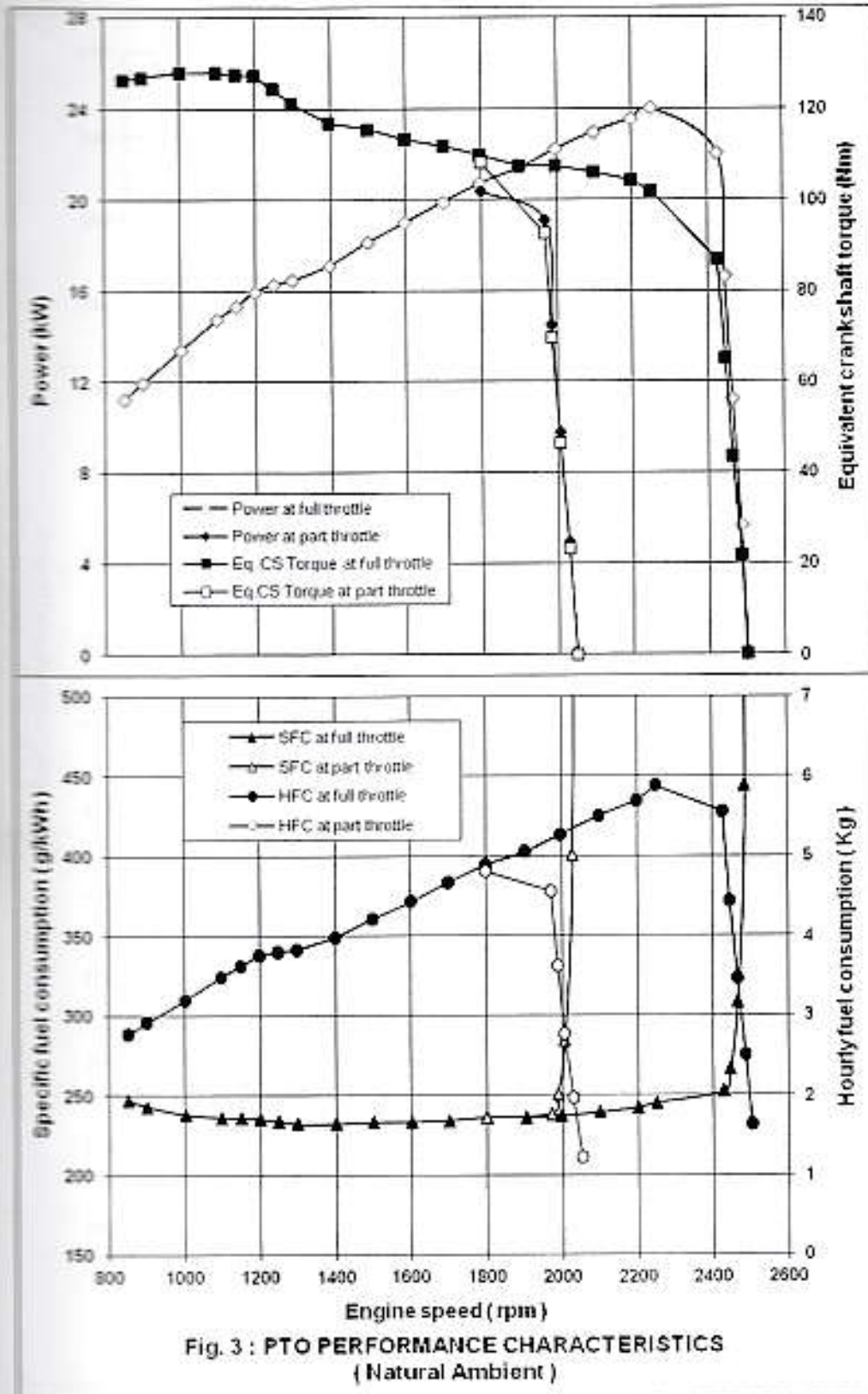


Fig. 3 : PTO PERFORMANCE CHARACTERISTICS  
( Natural Ambient )

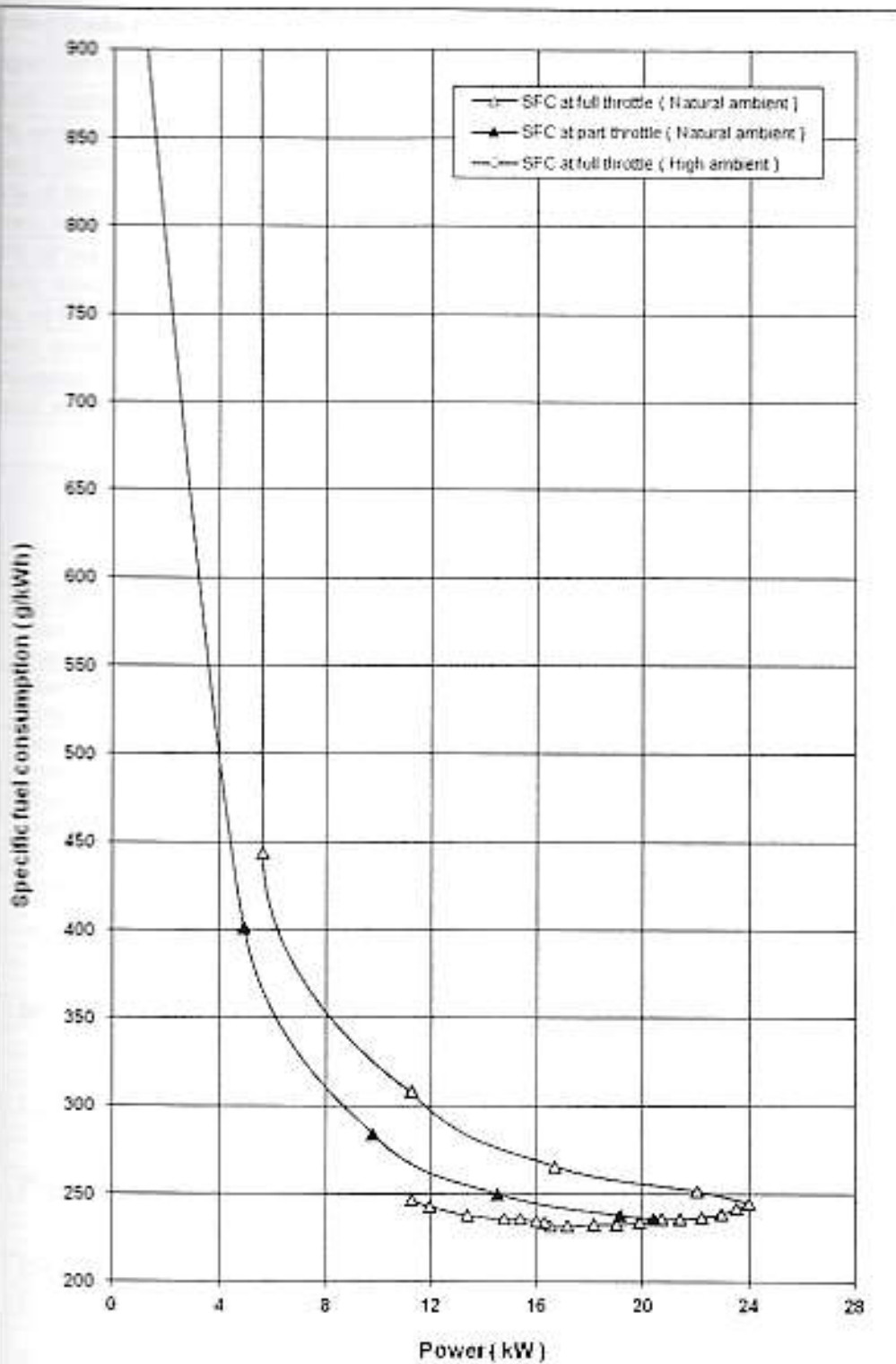


Fig. 4 : PTO PERFORMANCE CHARACTERISTICS



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| 1  | 2    | 3   | 4    | 5    | 6    | 7      | 8    |
|--|------|-----|------|------|------|--------|------|
| <b>f) Varying loads at standard PTO speed (540 ± 10 rpm): Variant Model</b>        |      |     |      |      |      |        |      |
| <b>ii) Torque corresponding to maximum power available at standard PTO speed :</b> |      |     |      |      |      |        |      |
| Variant model  | 20.4 | 539 | 1798 | 5.75 | 4.81 | 0.236  | 3.54 |
| <b>iii) 85% of the torque obtained in (i) :</b>                                    |      |     |      |      |      |        |      |
| Variant model  | 19.1 | 591 | 1969 | 5.45 | 4.56 | 0.238  | 3.51 |
| <b>iv) 75% of the torque obtained in (i):</b>                                      |      |     |      |      |      |        |      |
| Variant model  | 14.5 | 596 | 1986 | 4.33 | 3.62 | 0.250  | 3.35 |
| <b>v) 50% of the torque obtained in (ii) :</b>                                     |      |     |      |      |      |        |      |
| Variant model  | 9.8  | 602 | 2005 | 3.32 | 2.77 | 0.284  | 2.95 |
| <b>vi) 25% of the torque obtained in (ii):</b>                                     |      |     |      |      |      |        |      |
| Variant model  | 4.9  | 609 | 2028 | 2.36 | 1.97 | 0.401  | 2.08 |
| <b>vii) Unloaded:</b>  |      |     |      |      |      |        |      |
| Variant model  | 0.0  | 615 | 2050 | 1.46 | 1.22 | 122.00 | 0.01 |

| Sl. No. | Parameters   | Base model      |              | Variant Model   |
|---------|--|-----------------|--------------|-----------------|
|         |  | Natural Ambient | High Ambient | Natural Ambient |
| 1       | 2  | 3               | 4            | 5               |
| i)      | No load maximum speed, (rpm)                                   | 2477            | 2477         | 2501            |
| ii)     | Equivalent crankshaft torque at maximum power (Nm)             | 104.7           | 100.6        | 101.8           |
| iii)    | Maximum equivalent crank shaft torque (Nm)                     | 131.4           | 126.7        | 128.0           |
| iv)     | Engine speed at maximum equivalent crankshaft torque, (rpm)    | 858             | 918          | 1098            |
| v)      | Backup torque (%)  | 25.5            | 25.9         | 25.7            |
| vi)     | Smoke level, maximum light absorption coefficient, (per meter) | 0.25            | --           | 0.26            |
| vii)    | <b>Range of atmospheric condition :</b>                        |                 |              |                 |
|         | - Temperature, (°C)  | 25 to 26        | 41 to 44     | 25 to 29        |
|         | - Pressure, (kPa)  | 98.3 to 98.8    | 98.5 to 99.0 | 98.4 to 98.6    |
| viii)   | <b>Maximum Temperature, (°C):</b>                              |                 |              |                 |
|         | - Engine oil   | 98              | 106          | 89              |
|         | - Coolant  | 87              | 105          | 83              |
|         | - Fuel   | 43              | 58           | 39              |
|         | - Air intake   | 27              | 39           | 37              |
|         | - Exhaust gas  | 485             | 466          | 498             |
| ix)     | <b>Pressure at maximum power:</b>                              |                 |              |                 |
|         | - Intake air, (kPa)  | 1.3 to 1.5      | 2.0          | 3.5 to 3.6      |
| x)      | <b>Consumptions:</b>   |                 |              |                 |
|         | - Exhaust gas, (kPa)   | 5.9 to 6.0      | 13.9 to 16.7 | 5.9 to 6.3      |
|         | Lub. Oil (g/kWh)   |                 | 0.59         | --              |
|         | -Coolant (% of total coolant capacity)                         | --              | 2.65         | --              |



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ESCORTS LIMITED , 434 DS (BRAND NAME : POWERTRAC)  
TRACTOR -Commercial (Variant)

#### 4.0 OTHER APPLICABLE TESTS

##### 4.1 FIELD TEST

- 4.1 The field tests comprising of MB ploughing and rotavation were conducted for 10.1 & 10.0 hours respectively.  
All the field tests were conducted at the full accelerator settings, when the no load speed of the engine was varied from 2493 to 2500 rpm.
- 4.2 The brief specifications of the implements used during field tests are given in Annexure-II.
- 4.3 The summary of field test observation with Mould board plough & rotavator is given in Table - 3.

##### SUMMARY OF FIELD PERFORMANCE TEST

| S. No. | Parameter/operation                                       | MB Ploughing   | Rotavation     |
|--------|---|----------------|----------------|
| 1      | 2   | 3              | 4              |
| 1      | Type of soil  | Medium         | Medium         |
| 2      | Av. Soil moisture, (%) / Av. Depth of standing water (cm) | 13 to 14       | 11 to 13       |
| 3      | Bulk density of soil, (g/cc)                              | 1.1            | 1.20 to 1.25   |
| 4      | Cone index, (kgf/sq.cm) / Puddling index, (%)             | 5.1 to 5.8     | 4.8 to 5.9     |
| 5      | Gear used   | L-2            | L-2            |
| 6      | Av. Speed of operation, (kmph)                            | 3.42 to 3.80   | 4.14 to 4.08   |
| 7      | Av. Wheel slip, (%) / Av. Travel reduction, (%)           | 7.3 to 8.6     | -1.4 to -0.01  |
| 8      | Av. Depth of cut, (cm) / Av. Depth of puddle, (cm)        | 19 to 22       | 9              |
| 9      | Av. Working width, (cm)                                   | 70 to 76       | 145 to 151     |
| 10     | Area covered, (ha/h)                                      | 0.228 to 0.247 | 0.490 to 0.491 |
| 11     | Fuel consumption:   |                |                |
|        | - (l/h)   | 3.30 to 3.82   | 5.43 to 5.84   |
|        | - (l/ha)  | 14.47 to 15.46 | 11.05 to 11.91 |
| 12     | Av. draft of implement, (kN)                              | 5.95 to 6.9    | --             |

Remarks: The average lub oil and coolant (water) consumptions during the entire field tests were observed to be 2.74 ml/h and 18.2 ml/h respectively.

#### 5. ADJUSTMENTS, DEFECTS, BREAKDOWNS AND REPAIRS

| S. No. | Adjustment/Defect/Breakdown and Repairs | Tractor run hours |
|--------|---|-------------------|
| -      | -- None --                              | --                |





**6. COMPARISON BETWEEN BASE MODEL AND VARIANT MODEL**  
(Based on Table 3 & 4 of Indian Standard 12207:2014)

| Sl. No. | Clause No | Features                                | Observation on base model<br>(T-792/1300/September, 2011)         | Observation on variant model                  | Remarks              |                      |               |
|---------|-----------|---|---|---|----------------------|----------------------|---------------|
| 1       | 2         | 3                                       | 4   | 5   | 6                    |                      |               |
| 1.      | i)        | Clutch                                  | Single, dry friction plate  | Single, dry friction plate                    | No change            |                      |               |
| 2.      | ii)       | Air cleaner                             | Same configuration in base & variant models<br>(refer para 3.1.5) |   | No change            |                      |               |
| 3.      | iii)      | Exhaust system                          | Same configuration in base & variant models<br>(refer para 3.1.6) |   | No change            |                      |               |
| 4.      | iv)       | <b>Gear Box:</b>                        |   |   |                      |                      |               |
|         |           | - Type                                  | Mechanical, Constant mesh gears                                   | Mechanical, Constant mesh gears               | No Change            |                      |               |
| 5.      | v)        | <b>Reduction ratio of transmission:</b> |   |   |                      |                      |               |
|         |           | <b>Movement</b>                         | <b>Gear</b>   | <b>Base model</b>                             | <b>Variant model</b> | <b>Variation (%)</b> | <b>Remark</b> |
|         |           | Forward                                 | L1  | 182.16  | 193.4                | 6.2                  | Changed       |
|         |           |   | L2  | 131.17  | 128.9                | -1.7                 | -do-          |
|         |           |   | L3  | 82.64   | 83.7                 | 1.3                  | -do-          |
|         |           |   | L4  | 51.75   | 51.6                 | -0.3                 | -do-          |
|         |           |   | H1  | 58.94   | 61.1                 | 3.7                  | -do-          |
|         |           |   | H2  | 42.26   | 41.2                 | -2.5                 | -do-          |
|         |           |   | H3  | 26.63   | 27.0                 | 1.4                  | -do-          |
|         |           |   | H4  | 16.66   | 16.7                 | 0.2                  | -do-          |
|         |           | Reverse                                 | LR  | 140.76  | 155.7                | 10.6                 | -do-          |
|         |           |   | HR  | 45.27   | 49.9                 | 10.2                 | -do-          |
| 6.      | vi)       | <b>Range of speeds (kmph):</b>          |   |   |                      |                      |               |
|         |           | - Forward                               | 2.69 to 29.37   | 2.53 to 29.22<br>(Variation of -5.9 to 2.6 %) | Changed              |                      |               |
|         |           | - Reverse                               | 3.48 to 10.81   | 3.14 to 9.79<br>(Variation of -9.8 to -9.4 %) | Changed              |                      |               |
|         |           | Additional no. of speed                 | None  | None  | No change            |                      |               |
| 7.      | vii)      | <b>Fitment of accessories:</b>          |   |   |                      |                      |               |
|         |           | - Expansion tank                        | Provided  | Provided                                      | No change            |                      |               |
|         |           | - Additional hydraulic pump             | None  | None  | --do--               |                      |               |
|         |           | - Air compressor                        | None  | None  | --do--               |                      |               |
|         |           | - Radiator                              | Provided  | Provided                                      | --do--               |                      |               |
|         |           | - Bare radiator capacity, (l)           | 3.50  | 2.80  | Changed              |                      |               |
|         |           | Total coolant capacity, (l)             | 7.55  | 6.50  | Changed              |                      |               |
|         |           | - Oil cooler                            | None  | None  | No Change            |                      |               |
| 8.      | viii)     | <b>Brake system:</b>                    |   |   |                      |                      |               |
|         |           | Type                                    | Dry disc brake  | Dry disc brake                                | No Change            |                      |               |
| 9.      | ix)       | <b>Type of three point linkage:</b>     |   |   |                      |                      |               |
|         |           | Type                                    | Cat. I/Cat. II  | Cat. I/Cat. II                                | No change            |                      |               |
|         |           | Rear/front mounted                      | Rear mounted  | Rear mounted                                  | No change            |                      |               |



| 1   | 2   | 3  | 4  | 5                              | 6         |  |
|-----|---|--|--|--------------------------------|-----------|--|
| 10. | x)  | <b>PTO shafts:</b>   |  |                                |           |  |
|     |   | Location   | Centrally located  | Centrally located              | No change |  |
|     |   | Type   | Type-II, Not independent   | Type-I, Not independent        | Changed   |  |
|     |   | No of splines  | 21   | 6                              | Changed   |  |
|     |   | Speed corresponding to rated engine speed (rpm) - Anticlockwise rotation speed (rpm) | 1023 - Clockwise rotation  | 660 - Clockwise rotation       | Changed   |  |
| 11. | xi)   | <b>Type of drive:</b>  |  |                                |           |  |
|     |   | 2WD or 4WD   | 2WD  | 2WD                            | No change |  |
| 12. | xii)  | <b>Hydraulic System:</b>   |  |                                |           |  |
|     |   | Location & type of Hydraulic pump drive  | Same configuration in base & variant models (refer para 3.1.13). |                                | No change |  |
| 13. | xiii)   | <b>Positioning of Hydraulic Sensing Mechanism</b>                                    |  |                                |           |  |
|     |   | Lower link, top link, etc.   | Through lower link   | Through top link               | Changed   |  |
| 14. | xiv)  | <b>Rear differential &amp; Final Reduction unit:</b>                                 |  |                                |           |  |
|     |   | Speed reduction through crown wheel & bevel pinion                                   | 4.444:1 (40/9T)  | 3.727:1(41/11T)                | Changed   |  |
|     |   | Speed reduction through rear final drive   | 3.750:1 (60/16T)   | 4.428:1(62/14T)                | Changed   |  |
| 15. | xv)   | <b>Type of fuel injection pump:</b>  |  |                                |           |  |
|     |   | Inline/Rotary/Common rail  | Inline plunger   | Inline plunger                 | No change |  |
|     |   | Injection timing (by spill cut off method)   | 15.±1° BTDC  | 11+1° BTDC                     | Changed   |  |
| 16. | <b>Change related to statutory/ regulatory requirements (As per Table 4):</b>             |  |  |                                |           |  |
|     | a)  | Engine operating principle (spark/ compression ignition, two/four stroke)            | Compression Ignition, 4 stroke                                   | Compression Ignition, 4 stroke | No change |  |
|     | b)  | Number & arrangement of cylinders  | Three vertical inline  | Three vertical inline          | -do-      |  |
|     | c)  | Maximum declared PTO power, (kW)   | 23.5   | 23.5                           | -do-      |  |
|     | d)  | Bore /stroke ,(mm)   | 91/110   | 91/110                         | -do-      |  |
|     | e)  | Engine displacement (cc)   | 2146   | 2146                           | -do-      |  |
|     | f)  | Rated engine speed (rpm)   | 2200   | 2200                           | -do-      |  |
|     | g)  | Naturally aspirated/turbo charged  | Naturally aspirated  | Naturally aspirated            | -do-      |  |
| 17. | <b>Change related to ergonomics, safety comfort, statutory / regulatory requirements:</b> |  |  |                                |           |  |
|     | a)  | IS: 10273  | Conformed  | Conforms                       | No change |  |
|     | b)  | IS: 4931   | Conformed  | Conforms                       | -do-      |  |
|     | c)  | IS: 4468   | Did not conform  | Does not conform               | -do-      |  |
|     | d)  | IS: 12953  | Conformed  | Conforms                       | -do-      |  |
|     | e)  | IS:12343   | Did not conform  | Conform                        | Changed   |  |
|     | f)  | IS:12239 (Pt-I)  | Did not conform  | Does not conform               | No change |  |
|     | g)  | IS:12239 (Pt-II)   | Did not conform  | Does not conform               | -do-      |  |
|     | h)  | IS:8133  | Conformed  | Conforms                       | -do-      |  |
|     | i)  | IS: 6283   | Conformed  | Conforms                       | -do-      |  |
|     | j)  | IS:14683   | Conformed  | Conforms                       | -do-      |  |



| 1   | 2              | 3                       | 4    | 5    | 6       |
|-----|----------------|-------------------------|------|------|---------|
| 18. | Other changes: |                         |      |      |         |
|     | a)             | Make of steering system | ZF   | RANE | Changed |
|     | b)             | Overall length (mm)     | 3335 | 3190 | -do-    |
|     | c)             | Number of fuel filters  | Two  | One  | -do-    |

**2. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS**

2.1 On the basis of test conducted the performance results have been summarized as evaluative (mandatory) and non - evaluative (not mandatory) parameters applicable for qualifying Minimum Performance Criteria as per clause-4 table-1 of Indian Standard 12207: 2014 for acceptance of tractor for the purpose of subsidies/NABARD financing for the applicable features for this tractor model.

| Sl. No.                        | Characteristic  | Category (Evaluative / Non Evaluative) | Requirements as per IS: 12207-2014  | Values declared by the applicant/ requirement |                    | As observed |               | Whether variant model meets the requirements (Yes/No) |
|--------------------------------|---|--|---|---|--------------------|-------------|---------------|---|
|                                |   |  |   | Base model                                    | Variant model      | Base model  | Variant model |   |
| 1                              | 2   | 3                                      | 4   | 5 a   | 5 b                | 6 a         | 6 b           | 7   |
| <b>2.1.1 PTO Performance :</b> |   |  |   |   |                    |             |               |   |
| a)                             | -Max. power under 2 h test, (kW) (Natural ambient condition)      | Evaluative                             | Declared value to be achieved with a tolerance of: -5 / +10% for PTO power >26 kW. -7.5/+10% for PTO power ≤ 26 kW or -5 / +10% for engine power >26 kW. -7.5/+10% for engine power ≤ 26 kW | 23.5 (D)                                      | 23.5 (D)           | 24.1        | 24.1          | Yes   |
| b)                             | Power at rated engine speed, (kW)                                 | Non Evaluative                         | -do-  | 23.5 (D)                                      | 23.5 (D)           | 24.1        | 23.5          | Yes   |
| c)                             | Specific fuel consumption corresponding to maximum power, (g/kWh) | Non Evaluative                         | ± 5%  | 258 (D)                                       | 258 (D)            | 239         | 245           | Yes   |
| d)                             | Maximum equivalent crankshaft torque, (Nm)                        | Non Evaluative                         | ± 8%  | 116 (D)                                       | 116 (D)            | 131.4       | 128.0         | Yes   |
| e)                             | Back-up torque, percent   | Non Evaluative                         | 10 percent, min.  | 7 %, min. (R)                                 | 10% min. (R)       | 25.5        | 25.7          | Yes   |
| f)                             | b) Smoke level  | Evaluative                             | Maximum light absorption coefficient of 3.25 per metre or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR)   | 3.25 per meter (R)                            | 3.25 per meter (R) | 0.25        | 0.26          | Yes   |



| 1  | 2  | 3              | 4   | 5 a                               | 5 b      | 6 a                             | 6 b | 7   |
|--|--|----------------|---|-----------------------------------|----------|---------------------------------|-----|-----|
| <b>7.1.2 Safety features :</b>                                     |  |                |   |                                   |          |                                 |     |     |
| a)   | Guards against moving and hot parts                                      | Evaluative     | Belt drives, pulley, silencer, hydraulic pipes (As per IS 12239 (part 2))                     | Provided                          |          | Provided                        |     | Yes |
| b)   | Lighting arrangement (Tractor having more than 1150 mm rear track width) | Evaluative     | As per CMVR   | Provided                          |          | Provided                        |     | Yes |
| c)   | Sealing requirement (Tractors having more than 1150 mm rear track width) | Non-Evaluative | Should meet the requirements of IS 12343 (as amended from time to time)                       | Did not meet the requirement      |          | Meets the requirement           |     | Yes |
| d)   | Technical requirements for PTO shaft                                     | Non-Evaluative | Should meet the requirements of IS 4931 (as amended from time to time)                        | Meets the requirement             |          | Meets the requirement           |     | Yes |
| e)   | Dimension of three point linkage   | Non-Evaluative | Should meet the requirements of IS 4468 (part 1) (as amended from time to time)               | Did not meet the requirement      |          | Does not meet the requirement   |     | No  |
| f)   | Specification of linkage and swinging drawbars                           | Non-Evaluative | Should meet the requirements of IS 12953 and IS 12362 (part 3) (as amended from time to time) | Meets the requirement             |          | Meets the requirement           |     | Yes |
| <b>7.1.3 Labelling of tractors (Provision of labelling plate):</b> |  |                |   |                                   |          |                                 |     |     |
| 1)   | Make   | Evaluative     | Should conform to the requirements of CMVR along-with declared value of PTO HP                | --                                |          | Escorts limited                 |     | Yes |
| 2)   | Model  | Evaluative     |   | --                                |          | 434 DS (Brand name : Powertrac) |     | Yes |
| 3)   | Year of manufacture  | Evaluative     |   | --                                |          | AE (i.e. April, 2016)           |     | Yes |
| 4)   | Engine number  | Evaluative     |   | --                                |          | E3333151                        |     | Yes |
| 5)   | Chassis number   | Evaluative     |   | --                                |          | T05-3298440AE                   |     | Yes |
| 6)   | Declaration of PTO power, kW   | Evaluative     |   | --                                |          | 23.5                            |     | Yes |
| <b>7.1.4 Literature (Submission to test agency)</b>                |  |                |   |                                   |          |                                 |     |     |
| (a)  | Operator manual  | Evaluative     | Provided/ Not Provided  | As per relevant IS Code (IS 8132) | Provided |                                 |     | Yes |
| (b)  | Parts Catalogue  | Evaluative     | Provided/Not Provided   | As per relevant IS Code (IS 8132) | Provided |                                 |     | Yes |
| (c)  | Workshop/ Service manual   | Evaluative     | Provided/Not Provided   | As per relevant IS Code (IS 8132) | Provided |                                 |     | Yes |



**7.2 Salient Observations:**

**7.2.1 Laboratory tests:**

**7.2.1.1 PTO Performance:**

- i) The maximum power in case of base & variant was observed as 24.1 kW respectively against the declaration of 23.5 kW respectively. Which is within the tolerance limit specified in IS: 12207-2014.
- ii) The specific fuel consumption in case of base and variant models corresponding to maximum power was observed as 239 & 245 g/kWh against the declaration of 258 & 235 g/kWh respectively, which is within the tolerance limit.
- iii) The backup torque was observed as 25.7%.

**7.2.1.2 Location and operation of operator's control:**

- i) Provision of safety against accidental start of engine has not been provided.
- ii) The fuel shut-off lever does not remain in stop position

**7.2.1.3 Three point linkage:**

Lateral distance from lower hitch point to centre line of tractor does not meet the requirement as per IS:4468 (part -I)1997(mm).

**7.3 Maintenance / Service Problems:**

No noticeable maintenance or service problem was observed during the test.

**7.4 Recommendation with regard to safety on tractor:**

The following requirements, inter alia, may be considered for incorporation on the tractor:

- i) Provision of safety against accidental start of engine.
- ii) Provision for spark arresting device in exhaust system.
- iii) Provision of differential lock.
- iv) The fuel shut-off lever does not remain in stop position
- v) Provision of PTO master shield has not been provided.

**7.5.1 Applicant submitted the Literature during test with machine:**

- a) Operator's Manual for 'Escorts Ltd., 434DS, 439 E1 (Brand name: Powertrac)' tractor models.
- b) Spare Parts Catalogue for "Escorts Ltd., 434DS, 439 E1 (Brand name: Powertrac)" tractor models.
- c) Service manual for 'Escorts Ltd., 434DS, 439 E1 (Brand name: Powertrac)' tractor models.

The following point should be incorporated in the operator's manual.

Information related to PTO & Drawbar performance of the tractor such as, maximum PTO power, rated power, power at standard PTO speed, maximum torque, backup torque, specific fuel consumption, maximum drawbar power & pull etc should be included in the technical specification of the tractor for the guidance of the user's.

- 7.5.2** It is therefore, recommended that following literature may be brought out as per IS: 8132-1999 (Reaffirmed in March, 2009) for the guidance of users and service personnel in national as well as regional languages for this model of tractor.

The results of the tests carried out on variant model 'Escorts Ltd., 434 DS (Brand name: Powertrac)' Tractor have been compared with those on base model 'Escorts Ltd., Powertrac 434' Tractor and found within the limit, as specified in Indian Standard: 12207-2014.



T-02501616/2017

ESCORTS LIMITED , 434 DS (BRAND NAME : POWERTRAC)  
TRACTOR -Commercial (Variant)

**8. CITIZEN CHARTER**

| Duration of Test                    | Time frame for Testing & Evaluation as per Citizen Charter | Whether the Test Report is released within the time frame given in Citizen Charter | Remarks |
|-------------------------------------|--|--|---------|
| March to April , 2017<br>(2 Months) | 10 Months  | Yes  | None    |

**TESTING AUTHORITY:**

**PRAMOD YADAV**  
AGRICULTURAL ENGINEER

**C.V. CHIMOTE**  
TEST ENGINEER

**Y.K. RAO**  
SENIOR AGRICULTURAL  
ENGINEER

**J.J.R. NARWARE**  
DIRECTOR

**9. APPLICANT'S COMMENTS**

| Para No. | Our Reference               | Applicant's comments  |
|----------|-----------------------------|---|
| 9.1      | 7.1.2 (e), 7.2.1.3          | These being studied & corrective action would be taken in near future.  |
| 9.2      | 7.2.1.2, 7.4, 7.5.1 & 7.5.2 | Your valuable comments & suggestions for improvement are well taken. Under our policy of continuous product improvement these aspects are future being looked into & will try to eliminate these deviation soon wherever necessary. |

**ANNEXURE-I****TRACTOR RUN HOURS DURING TEST**

| A. | LABORATORY AND TRACK TESTS   | HOURS       |
|----|--|-------------|
| 1. | Running -in  | --          |
| 2. | PTO Performance Test   | 6.4         |
| 3. | Theoretical speed test   | 0.5         |
| 4. | Field test (Dry land only)   | 20.1        |
| B. | Miscellaneous test and other run hours, including idle run transportation, trial and preparation for test. | 4.0         |
|    | <b>Total</b>   | <b>31.0</b> |

**ANNEXURE-II**

| Sl. no | Item                          | Mould Board Plough | Rotavator      |
|--------|-------------------------------|--------------------|----------------|
| 1.     | Make                          | Field king         | Maschio        |
| 2.     | Type                          | Mounted            | Mounted        |
| 3.     | No. of bottoms /blades        | Three              | 36 in 7 flange |
| 4.     | Types of bottoms / blades     | General purpose    | Hatchet        |
| 5.     | Size of bottoms /blades(mm)   | 410                | 170x 70 x 10   |
| 6.     | Spacing of bottoms flange, mm | 355                | 200            |
| 7.     | Lower hitch point span,(mm)   | 775                | 760            |
| 8.     | Mast height,(mm)              | 575                | 550            |
| 9.     | Overall dimensions:           |                    |                |
|        | -Length                       | 2015               | 1560           |
|        | - Width                       | 1095               | 860            |
|        | - Height                      | 1100               | 950            |
| 10.    | Gross mass, (kg)              | 335                | 120            |