No. C3/25525/TC /2013

Transport Commissionerate
Kerala, Thiruvananthapuram
Dated: 04.11.2013

From
The Transport Commissioner
Thiruvananthapuram.

To
All Deputy Transport Commissioners,
All Regional Transport Officers,
All Joint Regional Transport Officers.

Sir,

Sub:- M.Vs.Dept - Approval for Registration of 435 E Back Hoe Loader & its Vâriants
Manufactured by M/s Ashok Leyland John Deere Constructions Equipment Company Pvt. Ltd - Copy of certificates forwarding of reg.

2. Certificate No. AAIN 0254 dated 30.08.2013 of ARAI

M/s Ashok Leyland John Deere Constructions Equipment Company Pvt. Ltd, Chennai in their letter dated 21.10.2013, has requested to grant approval for the registration of the following vehicles (Bharat Stage III CEV Norms) manufactured by M/s Ashok Leyland John Deere Constructions Equipment Company Pvt. Ltd

1. 435 E Back Hoe Loader
2. 435 E with Optional Rear Tyre 14.00x25-20PR Side Shift Loader Back Hoe
3. 435 E with Optional 0.24M^3/0.27M^3/0.12M^3/0.18 M^3/0.09M^3 Backhoe Bucket and 0.94M^3/1.0 M^3 Loader Bucket - Side Shift Loader Back Hoe

The Automotive Research Association of India has granted approval to above vehicles and certified that the vehicles comply with the CMV Rules 1989. Copy of the certificate issued by ARAI has been published in the website.

All the Registering Authorities and Additional Registering Authorities are directed to register the above vehicles subject to the compliance of CMV Rules, 1989 as amended up-to-date. They are also directed to verify the compliance of provisions of Act and Rules other than those mentioned in Annexure 1 and Annexure 1A of the ARAI certificate.

Yours faithfully,

Sd/-
Joint Transport Commissioner
For Transport Commissioner

Copy to M/s M/s Ashok Leyland John Deere Constructions Equipment Company Pvt. Ltd, 7th Floor West Wing, Shyamala Towers, 136 Arcot Road, Saligramam, Chennai- 600093 for information

Approved for Issue

Senior Superintendent
CERTIFICATE

FOR COMPLIANCE TO THE CENTRAL MOTOR VEHICLES RULES
(CONSTRUCTION EQUIPMENT VEHICLES).

1. In order to establish compliance to the provisions of CMVR, 1989, applicable as on date, documental verification/ necessary testing was carried out, on the following base model, submitted by the vehicle manufacturer referred below:

<table>
<thead>
<tr>
<th>Documental Reference</th>
<th>Vehicle Manufacturer</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Base Model</th>
<th>Type</th>
<th>Category</th>
<th>Seating Capacity (Incl. Driver)</th>
<th>ULW, kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>435E</td>
<td>Backhoe Loader</td>
<td>As per AIS:053°C*</td>
<td>1 Person</td>
<td>7200</td>
</tr>
<tr>
<td>Variants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 435E-with optional rear ty 14.00x26-20PR</td>
<td>Side Shift Loader Backhoe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 435E-with optional 0.24M^3/0.27M^3/0.12M^3/0.18M^3/0.09M^3 Backhoe Bucket and 0.94M^3/1.0M^3 Loader Bucket</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Engine Model</th>
<th>Power</th>
<th>cc</th>
<th>Engine Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>H4CTIC3N</td>
<td>56 kW @ 2200 rpm</td>
<td>3839</td>
<td>M/s. Ashok Leyland Ltd.</td>
</tr>
</tbody>
</table>

The brief technical specification (No. Nil dt. Nil) of the base model and its variants, are enclosed. The detailed specifications (No. Nil dt. Nil) duly endorsed, are also issued separately to the CEV manufacturer.

2. This Certificate is issued as per CMVR Rule 126, to establish compliance with the Central Motor Vehicles Rules, 1989 and shall not be construed as a certificate of compliance to any rules other than those listed in ANNEXURE-I & I-A.

3. This Certificate is issued for the above CEV base model and its variants subject to the conditions given below the table:

<table>
<thead>
<tr>
<th>Construction Equipment Vehicles</th>
<th>Effective From</th>
<th>Notification No.</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass Emission / Bharat Stage III-CEV</td>
<td>01.04.2011</td>
<td>GSR 276(E)</td>
<td>10.04.2007</td>
</tr>
<tr>
<td>Applicability for the respective CMVR Rules Notified</td>
<td>27.08.2002</td>
<td>GSR 642(E)</td>
<td>28.07.2000</td>
</tr>
<tr>
<td>Ref: GSR 242 (E) dt. 28.3.2002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category of the Vehicle / Emboossment of Engine &amp; Chassis No. Lighting &amp; Signalling Requirements and other Safety Components</td>
<td>Notified dates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S 0 1365(E)</td>
<td>13.12.2004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S 0 556(E)</td>
<td>16.09.2005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S 0 784(E)</td>
<td>12.11.2008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S 0 436(E)</td>
<td>15.03.2012</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Further ARAI issues Type Approval Certificates for vehicles / components / parts / assemblies etc. based on the documents produced / submitted by the customer and on these basis, the vehicles are examined and if approved, the certificate is issued. ARAI is in no way responsible for any misuse of copying of any design / type / system in connection with entire vehicle / components / parts and assemblies. Breach of any statutory provision of Indian laws or laws of other countries, will be the sole responsibility of the customer and ARAI shall not be liable for any claims or damages, made by the party, whatsoever, the customer shall alone be liable for the same, and undertakes to indemnify ARAI in this regard. Further, the ARAI has the right to initiate cancellation / withdrawal of the certificate issued, in case of any fraud, misrepresentation, when it surfaces and comes in the knowledge of ARAI. The appropriate local courts at Pune shall have the jurisdiction in respect of any dispute, claim or liability arising out of this certificate / Report.

AUTHORISED SIGNATORY,

Mrs. Rashmi Urdhwareshe, SR. D.EP. DEPUTY DIRECTOR, HOMOLOGATION MANAGEMENT & REGULATION, ARAI, PUNE.

Place of issue: Pune

SHRIKANT R. MARATH, DIRECTOR, ARAI, PUNE.
ANNEXURE-I

To
CMVR CERTIFICATE No. A A I N 0254 dated: 30th August 2013

Following rules are verified and found to be complying:

<table>
<thead>
<tr>
<th>Rule No.</th>
<th>Sub Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule 93</td>
<td>Overall dimensions of construction equipment vehicles (1A), (3A), (4A), (6A) &amp; (7A)</td>
</tr>
<tr>
<td>Rule 94</td>
<td>Condition of tyres (1), (2) &amp; (3)</td>
</tr>
<tr>
<td>Rule 95</td>
<td>Size and ply rating of tyres Fr: 9.0x16-16PR Rr: 16.9x28-12 PR - for Basic Model 14.00x25-20PR - for Variants Make: MRF/JK/ Apollo/Coat (1), (2), (3) &amp; (5)</td>
</tr>
<tr>
<td>Rule 96 A</td>
<td>Brakes for construction equipment vehicle (1), (2), (3), (6) &amp; (7)</td>
</tr>
<tr>
<td>Rule 98 A</td>
<td>Steering gears for construction equipment vehicles (1), (2) &amp; (3)</td>
</tr>
<tr>
<td>Rule 99</td>
<td>Forward and backward motion ---</td>
</tr>
<tr>
<td>Rule 100</td>
<td>Safety glass (Laminated Safety Glass) (3A)</td>
</tr>
<tr>
<td>Rule 101</td>
<td>Windscreen wiper (Power Operated) (2A)</td>
</tr>
<tr>
<td>Rule 102</td>
<td>Signalling devices, direction indicators and stop lights (1) &amp; (2)</td>
</tr>
<tr>
<td>Rule 103</td>
<td>Position of the indicator (1) &amp; (2)</td>
</tr>
<tr>
<td>Rule 104 A</td>
<td>Fitment of reflectors on construction equipment vehicles (i), (ii), (iii), (iv), (v), (vi) &amp; (vii)</td>
</tr>
<tr>
<td>Rule 105</td>
<td>Lamps (1)(g), (2)(ii), (3A), (6) &amp; (8)</td>
</tr>
<tr>
<td>Rule 106</td>
<td>Deflection of lights (1)</td>
</tr>
<tr>
<td>Rule 107 A</td>
<td>Implement lights for construction equipment vehicle ---</td>
</tr>
<tr>
<td>Rule 108 A</td>
<td>Use of red or white light on construction equipment vehicles ---</td>
</tr>
<tr>
<td>Rule 109</td>
<td>Parking light ---</td>
</tr>
<tr>
<td>Rule 111</td>
<td>Prohibition of spot lights, etc. *</td>
</tr>
<tr>
<td>Rule 112</td>
<td>Exhaust gases ---</td>
</tr>
<tr>
<td>Rule 113</td>
<td>Location of exhaust pipes ---</td>
</tr>
<tr>
<td>Rule 115 A</td>
<td>Emission of smoke and vapour from agricultural tractors and construction equipment vehicles driven by diesel engines (Bharat Stage III – CEV) (1), (2), (3), (4) &amp; (6)</td>
</tr>
<tr>
<td>Rule 117</td>
<td>Speedometer (1) &amp; (3)</td>
</tr>
<tr>
<td>Rule 119</td>
<td>Horns (As amended by GSR 784(E) ref. ANNEXURE-IA) (1) &amp; (3)</td>
</tr>
<tr>
<td>Rule 120</td>
<td>Silencers *</td>
</tr>
<tr>
<td>Rule 121</td>
<td>Painting of Motor Vehicles (1)</td>
</tr>
<tr>
<td>Rule 122</td>
<td>Embossment of the chassis number &amp; engine number &amp; date of manufacture (1A) &amp; (2) (As amended by GSR 784(E) ref. ANNEXURE-IA)</td>
</tr>
<tr>
<td>Rule 124</td>
<td>Safety standards of components (As amended by GSR 784(E) ref. ANNEXURE-IA) S. O. 1365(E) dt. 13.12.2004 Automobile Lamps including CEVs 1 AIS:034/2004 w.e.f 01.10.2005 Performance of Lighting &amp; Light signalling system 20 SS 15.1 w.e.f 13.12.2004</td>
</tr>
<tr>
<td>Rule 125 A</td>
<td>Safety belt, etc. for construction equipment vehicles</td>
</tr>
</tbody>
</table>

*To be verified after notification for applicability of the respective rules.

ANNEXURE-IA

<table>
<thead>
<tr>
<th>CMV Rule</th>
<th>Test Standards</th>
<th>Effective From</th>
<th>Compliance Verified</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Definitions (Classification for the Construction Equipment Vehicle) – C AIS:053:2005</td>
<td>12.11.2008</td>
<td>✓</td>
</tr>
<tr>
<td>122 (1- A)</td>
<td>Embossment of the chassis number &amp; engine number</td>
<td>Height of chassis number 01.04.2009</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>CMV Rule 124(1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sl. No. 18</td>
<td>Tell Tale symbols and control AIS:071-2009 (Part-1 &amp; Part-2)</td>
<td>15.03.2014</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>CMV Rule 124(4) : The procedure for type approval and establishing conformity of production for components</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sl. No. 1 &amp; 3</td>
<td>Safety Glass, Horn AIS:037-2004</td>
<td>01.04.2009</td>
<td>✓</td>
</tr>
<tr>
<td>Sl. No. 7</td>
<td>Bulb AIS:037-2004</td>
<td>01.10.2009</td>
<td>✓</td>
</tr>
<tr>
<td>Sl. No. 17, 18</td>
<td>Retro-reflector, Lighting and Signaling devices, AIS:037-2004</td>
<td>01.04.2010</td>
<td>✓</td>
</tr>
</tbody>
</table>

AUTHORISED SIGNATORY,

SHRIKANT R. MARATHE,
DIRECTOR,
ARAI, PUNE.

Page 2 of 2

APX/13-14/7094 Emission Test Report No: (H4CTC3N engine) TA-CEV(Bharat Stage III)/ELTR/12-13/251 dt. 09.10.2012
### Brief Technical Specifications for Construction Equipment Vehicle

<table>
<thead>
<tr>
<th>Details of the manufacturer</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name and address</td>
<td>Ashok Leyland John Deere Construction Equipment Company Private Limited. No.61, Chinna Obulapuram, Gummipoondi Taluk, Thiruvallur-601201 Tamil Nadu, India</td>
<td></td>
</tr>
<tr>
<td>Telephone No.</td>
<td>020-66425376 / +91 9922922918</td>
<td>044-6790 2026 / +91-7299997386</td>
</tr>
<tr>
<td>Fax No. / E-mail ID</td>
<td>044-22206001</td>
<td><a href="mailto:kallappankarthik@johndeere.com">kallappankarthik@johndeere.com</a> <a href="mailto:thathaiyanganesan@johndeere.com">thathaiyanganesan@johndeere.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vehicle data</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic model</td>
<td>435E</td>
<td></td>
</tr>
<tr>
<td>Type (Brief description)</td>
<td>Backhoe Loader-Construction Equipment Vehicle</td>
<td></td>
</tr>
<tr>
<td>Variant(s)</td>
<td>*435E with optional rear tyre 14.00 X 25-20 PR.</td>
<td>*435E with optional 0.24M³ / 0.27M³ / 0.12M³ / 0.15M³ / 0.09M³ Backhoe Bucket and 0.94 M³ / 1.0 M³ Loader Bucket</td>
</tr>
<tr>
<td>Type (Brief description)</td>
<td>Construction Equipment Vehicle- Side shift Loader Backhoe</td>
<td></td>
</tr>
<tr>
<td>Implements / Attachments (Brief description)</td>
<td>Loader Shovel and backhoe</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Engine</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Make</td>
<td>M/s Ashok Leyland &amp; Co Ltd ,Ennore, Chennai</td>
<td></td>
</tr>
<tr>
<td>Model and identification</td>
<td>H4CTIC3N</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Internal Combustion Diesel Engine, Vertical Inline Direct Injection, TCIC(Turbocharger and Inter cooler), Water Cooled</td>
<td></td>
</tr>
<tr>
<td>Bore x stroke (mm)</td>
<td>104x113mm</td>
<td></td>
</tr>
<tr>
<td>No. of cylinders</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Displacement</td>
<td>3.839 liters</td>
<td></td>
</tr>
<tr>
<td>Compression ratio</td>
<td>17.5±0.5:1</td>
<td></td>
</tr>
<tr>
<td>Max. Engine output (kW@rpm)</td>
<td>56 KW+/-5% @2200-1650rpm</td>
<td></td>
</tr>
<tr>
<td>Max. Torque (Nm@rpm)</td>
<td>350Nm@1300-1500RPM</td>
<td></td>
</tr>
<tr>
<td>Air cleaner</td>
<td>Fleet Guard (or) Equivalent</td>
<td></td>
</tr>
</tbody>
</table>

| Oil filter                  | Thru Flow 75% efficiency at rated flow of 60 LPM after 22 hours. Max dia of grain passable thro’ is 32 microns.(Striked-Since Details not required) |  |

### Fuel filter
Spin on type with in-built water separator.

### Notes
- The document includes specifications for a construction equipment vehicle, detailing its manufacturer's information, basic model, type, variant details, and engine specifications.
- The engine specifications include details such as bore and stroke, number of cylinders, displacement, compression ratio, maximum engine output, maximum torque, and air cleaner type.
- The oil filter specification mentions a thru-flow efficiency and maximum grain passable diameter.
- The fuel filter specification notes the use of a spin-on type with an in-built water separator.

### Signatures and Stamps
- The document has signatures and stamps indicating approval and certification from ARAI (The Automotive Research Association of India) and other relevant authorities.
- There is a signature of Mrs. Rashmi L. Dharmawareshe, Sr. Deputy Director, Homologation Management & Regulation, ARAI Pune.
Table 14 of AIS-007 (Revision 4)

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity of cooling system</td>
<td>Fleet Guard, 3-5 Micron, 95% Efficiency @120L/Hr (Striked – Since details not required)</td>
</tr>
<tr>
<td>Oil sump capacity (l)</td>
<td>Coolant / 6.0 lts (Engine alone)</td>
</tr>
<tr>
<td>Weight of engine (kg) (complete)</td>
<td>8 Liters</td>
</tr>
<tr>
<td>Radiator frontal area (core area)</td>
<td>0.38 m²</td>
</tr>
<tr>
<td>Catalytic converter details, if fitted</td>
<td>L640 X B607.53 = 388819.2 mm²</td>
</tr>
<tr>
<td>Clutch</td>
<td>Fluid Clutch-Hydrodynamic Torque Converter</td>
</tr>
<tr>
<td>Outside diameter (Friction Material)</td>
<td>223 mm</td>
</tr>
<tr>
<td>Gear box</td>
<td></td>
</tr>
<tr>
<td>Make</td>
<td>Carraro</td>
</tr>
<tr>
<td>Model &amp; identification</td>
<td>TLB1-Transmission</td>
</tr>
<tr>
<td>Type</td>
<td>4 Speed-Synchro Shuttle Transmission with Electrically Operated forward &amp; Reversing Shuttle. 2 Wheel Drive</td>
</tr>
<tr>
<td>No. of gears</td>
<td>4F &amp; 4R</td>
</tr>
<tr>
<td>Gear ratio</td>
<td></td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>5.603</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>3.481</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>1.585</td>
</tr>
<tr>
<td>4&lt;sup&gt;th&lt;/sup&gt;</td>
<td>0.793</td>
</tr>
<tr>
<td>Reverse</td>
<td></td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>4.643</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>2.884</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>1.313</td>
</tr>
<tr>
<td>4&lt;sup&gt;th&lt;/sup&gt;</td>
<td>0.657</td>
</tr>
<tr>
<td>Front axle ratio</td>
<td>NA</td>
</tr>
<tr>
<td>Rear axle ratio</td>
<td>17.08</td>
</tr>
<tr>
<td>Steering</td>
<td>Ackerman</td>
</tr>
<tr>
<td>Steering wheel diameter (mm)</td>
<td>406+15.5 mm</td>
</tr>
<tr>
<td>Ratio</td>
<td>11.00:1</td>
</tr>
<tr>
<td>No. of rotation of the wheel (Lock to lock)</td>
<td>LH to RH - 3 revolutions, RH to LH - 4 revolutions</td>
</tr>
<tr>
<td>Steered axle</td>
<td>Front Axle</td>
</tr>
<tr>
<td>Frame</td>
<td></td>
</tr>
<tr>
<td>Long member size (mm)</td>
<td>Fabricated Non Uniform Structure</td>
</tr>
<tr>
<td>Number of cross members</td>
<td>-</td>
</tr>
<tr>
<td>Suspension</td>
<td>-</td>
</tr>
<tr>
<td>Type (Brief description)</td>
<td>-</td>
</tr>
<tr>
<td>Spring</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**

- **Fleet Guard, 3-5 Micron, 95% Efficiency @120L/Hr (Striked – Since details not required)**
- **Coolant / 6.0 lts (Engine alone)**
- **8 Liters**
- **0.38 m²**
- **L640 X B607.53 = 388819.2 mm²**
- **Fluid Clutch-Hydrodynamic Torque Converter**
- **223 mm**
- **Carraro**
- **TLB1-Transmission**
- **4 Speed-Synchro Shuttle Transmission with Electrically Operated forward & Reversing Shuttle. 2 Wheel Drive**
- **4F & 4R**
- **5.603, 3.481, 1.585, 0.793**
- **4.643, 2.884, 1.313, 0.657**
- **17.08**
- **Acknowledgement:**
  - **The Automotive Research Association of India (ARAI)**
  - **Progress through Research**
Table 14 of AIS-007 (Revision 4)

| **Anti-roll bar** | - |
| **Shock absorbers** | - |

**Brake**

| Service brake (Brief description) | Wet Multi-Disc Brake |
| Front | - |
| Rear | Wet Multi-Disc Brake Individual left and right side braking |
| Total braking area (cm²) | 2182 cm² |
| Secondary brake (Brief description) | - |
| Parking brake (Brief description) | Spring Applied Manually Operated |

**Wheels and tyres**

| Wheel rim size | 6.00G X 16 (Front) W15L X 28 (Rear - Basic model) 10.00/1.5-25 (Rear - Variant model) |
| Tyre size and ply rating | 9x16 -16 PR (Front) 16.9x28 -12 PR (Rear - Basic model) 14x25 - 20 PR (Rear - Variant model) |
| Dynamic rolling radius of tyre | 437.5 mm (Front) 674 mm (Rear - Basic model) 647 mm (Rear - Variant model) |
| Tyre pressure (front & rear) (kg/cm²) | 7.39 kg/cm² (Front) 2.65 kg/cm² (Rear - Basic model) 4.84 kg/cm² (Rear - Variant model) |

**Electrical system**

| System voltage (V) | 12V DC |
| Battery rating | 130 Ah, CCA: 720A. RC:247Min |
| Alternator type | External Fan type, 12V/65A Alternator |
| Max. output | 65A nominal, 14.2V +/-0.3V |
| Wiping system (Brief description) | Electrically operated |
| Wiper motor | 12V DC, Dual speed with park position |

**Fuel tank**

| Material | MS steel |
| Capacity (l) | 131 Liters |

**Dimensions in travel mode**

<p>| Wheel base (mm) | 2110 |
| Overall width (mm) | 2237 (2346 - Width over Bucket) |
| Overall length (mm) | 7389 |
| Overall height (mm) | (3900 - Transport Height) (2922 - Height to top of cab) |
| Front track (mm) | 1723 |
| Rear track (mm) | 1794 |
| Min. ground clearance (mm) | 354 |
| Min. turning circle diameter (m) | RH- 7.86m LH- 8.0 m |</p>
<table>
<thead>
<tr>
<th>Max. clearance circle diameter (m)</th>
<th>RH- 10.66m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LH- 11.10m</td>
</tr>
</tbody>
</table>

**Weights**

<table>
<thead>
<tr>
<th>Unladen FAW, kg (FAW1, FAW2 etc.)</th>
<th>1520</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unladen RAW, kg (RAW1, RAW2 etc.)</td>
<td>5680</td>
</tr>
<tr>
<td>Unladen weight, kg (weight in travel mode with 90% fuel, accessories and tools)</td>
<td>7200</td>
</tr>
<tr>
<td>Maximum gradeability (laden)</td>
<td>30 Degrees</td>
</tr>
<tr>
<td>Maximum speed (kmph)</td>
<td>Forward 39.6 Km/Hr., Reverse 47.8 Km/Hr.</td>
</tr>
<tr>
<td>Seating capacity and layout</td>
<td>1</td>
</tr>
</tbody>
</table>

**ARAI**

Progress through Research

THE AUTOMOTIVE RESEARCH ASSOCIATION OF INDIA

30 AUG 2013
# Table 11 of AIS-007 (Revision 4)

**DETAILS OF LOCATION OF CHASSIS NUMBER AND CODE FOR MONTH AND YEAR OF MANUFACTURE AS PER RULE 122 OF CMVR**

<table>
<thead>
<tr>
<th>Name of the Vehicle Manufacturer &amp; Address</th>
<th>Ashok Leyland John Deere construction Equipment Company Private Ltd. No.61, Chinnamubiparam Gummidipoondi Taluk, Thiruvallur-601201, Tamil Nadu, India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of the basic model</td>
<td>435E Backhoe Loader</td>
</tr>
</tbody>
</table>
| Name of Variants, if any                           | *435E with optional rear tyre14.00 X 25-20 PR  
 *435E with optional 0.24 M^3 / 0.27 M^3 / 0.18 M^3 / 0.12 M^3 / 0.09 M^3 Backhoe Bucket and 0.94 M^3/1.0 M^3 Loader Bucket |
| Place of Embossing or etching the Chassis Number   | Right Side Outer face of the Mast Tower Pictures attached                                                                             |
| (Vehicle Identification Number). Supporting details| by drawing or pictures may be provided if necessary                                                                                 |

## Code for month and year of production:

<table>
<thead>
<tr>
<th>Month</th>
<th>Code</th>
<th>Code for year of production:</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>A</td>
<td>2013</td>
<td>D</td>
</tr>
<tr>
<td>February</td>
<td>B</td>
<td>2014</td>
<td>E</td>
</tr>
<tr>
<td>March</td>
<td>C</td>
<td>2015</td>
<td>F</td>
</tr>
<tr>
<td>April</td>
<td>D</td>
<td>2016</td>
<td>G</td>
</tr>
<tr>
<td>May</td>
<td>E</td>
<td>2017</td>
<td>H</td>
</tr>
<tr>
<td>June</td>
<td>F</td>
<td>2018</td>
<td>I</td>
</tr>
<tr>
<td>July</td>
<td>G</td>
<td>2019</td>
<td>J</td>
</tr>
<tr>
<td>August</td>
<td>H</td>
<td>2020</td>
<td>K</td>
</tr>
<tr>
<td>September</td>
<td>I</td>
<td>2021</td>
<td>L</td>
</tr>
<tr>
<td>October</td>
<td>J</td>
<td>2022</td>
<td>M</td>
</tr>
<tr>
<td>November</td>
<td>K</td>
<td>2023</td>
<td>N</td>
</tr>
<tr>
<td>December</td>
<td>L</td>
<td>2024</td>
<td>O</td>
</tr>
</tbody>
</table>

Position of the code for month of production in the Chassis number: 18th Position (Excluding the asterisks)

Position of the code for year of production in the Chassis number: 10th Position (Excluding the asterisks)

Height of the Chassis number (Vehicle Identification Number): 7 mm
Example of Engine No. :-
DYEM201966

Example of Chassis No. (Vehicle Identification Number) with Month & Year of Manufacture: -
*1XJ435EXHD0100008F*
Table 14 of AIS-007 (Revision 4)

BRIEF TECHNICAL SPECIFICATIONS FOR CONSTRUCTION EQUIPMENT VEHICLE

<table>
<thead>
<tr>
<th>Details of the manufacturer</th>
<th>Ashok Leyland John Deere Construction Equipment Company Private Limited. No.61, Chinna Obulapuram, Gummidipoondi Taluk, Thiruvallur-601201 Tamil Nadu, India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone No.</td>
<td>026-66425376/ +91 9922922918 /044-6790 2026 / +91-7299997386</td>
</tr>
<tr>
<td>Fax No. / E-mail ID</td>
<td><a href="mailto:kaliappankarthik@johndeere.com">kaliappankarthik@johndeere.com</a>, <a href="mailto:thatthaiyanganesan@johndeere.com">thatthaiyanganesan@johndeere.com</a></td>
</tr>
</tbody>
</table>

Vehicle data

<table>
<thead>
<tr>
<th>Basic model</th>
<th>435E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type (Brief description)</td>
<td>Backhoe Loader-Construction Equipment Vehicle</td>
</tr>
<tr>
<td>Variant(s)</td>
<td>*435E with optional rear tyre 14.00 X 25-20 PR.</td>
</tr>
<tr>
<td>Type (Brief description)</td>
<td>Construction Equipment Vehicle- Side shift Loader Backhoe</td>
</tr>
<tr>
<td>Implements / Attachments (Brief description)</td>
<td>Loader Shovel and backhoe</td>
</tr>
<tr>
<td>Engine No.</td>
<td>DYEM201966</td>
</tr>
<tr>
<td>Chassis No.</td>
<td><em>1XJ435EXHD010000E</em></td>
</tr>
</tbody>
</table>

Engine

<table>
<thead>
<tr>
<th>Make</th>
<th>M/s Ashok Leyland &amp; Co Ltd, Ennore, Chennai</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model and identification</td>
<td>H4CTIC3N</td>
</tr>
<tr>
<td>Type</td>
<td>Internal Combustion Diesel Engine, Vertical Inline Direct Injection, TCIC (Turbocharger and Inter cooler), Water Cooled</td>
</tr>
<tr>
<td>Bore x stroke (mm)</td>
<td>104x113mm</td>
</tr>
<tr>
<td>No. of cylinders</td>
<td>4</td>
</tr>
<tr>
<td>Displacement</td>
<td>3.639 liters</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>17.5±0.5:1</td>
</tr>
<tr>
<td>Max. Engine output (kW@rpm)</td>
<td>56 KW+/−5% @2200±50RPM</td>
</tr>
<tr>
<td>Max. Torque (Nm@rpm)</td>
<td>350Nm@1300-1500RPM</td>
</tr>
<tr>
<td>Air cleaner</td>
<td>Fleet Guard (or) Equivalent</td>
</tr>
</tbody>
</table>

Oil filter

Thru Flow 75% efficiency at rated flow of 60 LPM after 22 hours. Max dia. of grain passable thro’ is 32 microns. (Striked-Since Details not required)

Fuel filter

Spin on type with in-built water separator.

---

[Signature]

Mrs. RAMESHBHAI Regardless
Sr. Deputy Director
Homologation, Management & Regulation, ARAI Pune

[Signature]

Date: [30 AUG 2013]
<table>
<thead>
<tr>
<th><strong>Table 14 of AIS-007 (Revision 4)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capacity of cooling system</strong></td>
</tr>
<tr>
<td><strong>Oil sump capacity (l)</strong></td>
</tr>
<tr>
<td><strong>Weight of engine (kg) (complete)</strong></td>
</tr>
<tr>
<td><strong>Radiator frontal area (core area)</strong></td>
</tr>
<tr>
<td><strong>Catalytic converter details, if fitted</strong></td>
</tr>
<tr>
<td><strong>Clutch</strong></td>
</tr>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td><strong>Outside diameter (Friction Material)</strong></td>
</tr>
<tr>
<td><strong>Gear box</strong></td>
</tr>
<tr>
<td><strong>Make</strong></td>
</tr>
<tr>
<td><strong>Model &amp; identification</strong></td>
</tr>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td><strong>Gear ratio</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Front axle ratio</strong></td>
</tr>
<tr>
<td><strong>Rear axle ratio</strong></td>
</tr>
<tr>
<td><strong>Steering</strong></td>
</tr>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td><strong>Steering wheel diameter (mm)</strong></td>
</tr>
<tr>
<td><strong>Ratio</strong></td>
</tr>
<tr>
<td><strong>No. of rotation of the wheel (Lock to lock)</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Steered axle</strong></td>
</tr>
<tr>
<td><strong>Frame</strong></td>
</tr>
<tr>
<td><strong>Long member size (mm)</strong></td>
</tr>
<tr>
<td><strong>Number of cross members</strong></td>
</tr>
<tr>
<td><strong>Suspension</strong></td>
</tr>
<tr>
<td><strong>Type (Brief description)</strong></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
</tr>
</tbody>
</table>
### Table 14 of AIS-007 (Revision 4)

| Anti-roll bar | - |
| Shock absorbers | - |
| **Brake** | | |
| Service brake (Brief description) | Wet Multi-Disc Brake |
| Front | - |
| Rear | Wet Multi-Disc Brake |
| Individual left and right side braking | |
| Total braking area (cm²) | 2182 cm² |
| Secondary brake (Brief description) | - |
| Parking brake (Brief description) | Spring Applied Manually Operated |
| **Wheels and tyres** | | |
| Wheel rim size | 6.00G X 16 (Front) |
| W15L X 28 (Rear - Basic model) | 10.00/1.5-25 (Rear - Variant model) |
| Tyre size and ply rating | 9x16 -16 PR (Front) |
| 16.9x28 -12 PR (Rear - Basic model) | 14x25 - 20 PR (Rear - Variant model) |
| Dynamic rolling radius of tyre | 437.5 mm (Front) |
| 674 mm (Rear - Basic model) | 647 mm (Rear - Variant model) |
| Tyre pressure (front & rear) (kg/cm²) | 7.39 kg/cm² (Front) |
| 2.65 kg/cm² (Rear - Basic model) | 4.84 kg/cm² (Rear - Variant model) |
| **Electrical system** | | |
| System voltage (V) | 12V DC |
| Battery rating | 130 Ah, CCA: 720A, RC:247Min |
| Alternator type | External Fan type, 12V/65A Alternator |
| Max. output | 65A nominal, 14.2V +/-0.3V |
| Wiping system (Brief description) | Electrically operated |
| Wiper motor | 12V DC, Dual speed with park position |
| **Fuel tank** | | |
| Material | MS steel |
| Capacity (l) | 131 Liters |
| **Dimensions in travel mode** | | |
| Wheel base (mm) | 2110 |
| Overall width (mm) | 2237 |
| (2346 -Width over Bucket) | |
| Overall length (mm) | 7389 |
| Overall height (mm) | (3900- Transport Height) |
| (2922-Height to top of cab) | |
| Front track (mm) | 1723 |
| Rear track (mm) | 1794 |
| Min. ground clearance (mm) | 354 |
| Min. turning circle diameter (m) | RH- 7.86m |
| | LH- 8.0 m |
Table 14 of AIS-007 (Revision 4)

| Max. clearance circle diameter (m) | RH- 10.66m  
LH- 11.10m |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Weights</td>
<td></td>
</tr>
<tr>
<td>Unladen FAW, kg (FAW1, FAW2 etc.)</td>
<td>1520</td>
</tr>
<tr>
<td>Unladen RAW, kg (RAW1, RAW2 etc.)</td>
<td>5680</td>
</tr>
<tr>
<td>Unladen weight, kg (weight in travel mode with 90% fuel, accessories and tools)</td>
<td>7200</td>
</tr>
<tr>
<td>Maximum gradeability (laden)</td>
<td>30 Degrees</td>
</tr>
<tr>
<td>Maximum speed (kmph)</td>
<td>Forward 39.6 Km/Hr., Reverse 47.8 Km/Hr.</td>
</tr>
<tr>
<td>Seating capacity and layout</td>
<td>1</td>
</tr>
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</table>
Table 11 of AIS-007 (Revision 4)

DETAILS OF LOCATION OF CHASSIS NUMBER AND CODE FOR MONTH AND YEAR OF MANUFACTURE AS PER RULE 122 OF CMVR

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Name of the basic model</td>
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</tr>
</tbody>
</table>
| Name of Variants, if any                                                        | *435E with optional rear tyre14.00 X 25-20 PR  
*435E with optional 0.24M^3 / 0.27M^3 / 0.18 M^3 / 0.12M^3 / 0.09M^3 Backhoe Bucket and 0.94 M^3 / 1.0 M^3 Loader Bucket |
| Place of Embossing or etching the Chassis Number (Vehicle Identification Number). Supporting details by drawing or pictures may be provided if necessary. | Right Side Outer face of the Mast Tower Pictures attached                                                                                                                                 |

Code for month and year of production:

<table>
<thead>
<tr>
<th>Code for month of production:</th>
<th>Code for year of production:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month</td>
<td>Code</td>
</tr>
<tr>
<td>January</td>
<td>A</td>
</tr>
<tr>
<td>February</td>
<td>B</td>
</tr>
<tr>
<td>March</td>
<td>C</td>
</tr>
<tr>
<td>April</td>
<td>D</td>
</tr>
<tr>
<td>May</td>
<td>E</td>
</tr>
<tr>
<td>June</td>
<td>F</td>
</tr>
<tr>
<td>July</td>
<td>G</td>
</tr>
<tr>
<td>August</td>
<td>H</td>
</tr>
<tr>
<td>September</td>
<td>I</td>
</tr>
<tr>
<td>October</td>
<td>J</td>
</tr>
<tr>
<td>November</td>
<td>K</td>
</tr>
<tr>
<td>December</td>
<td>L</td>
</tr>
</tbody>
</table>

Position of the code for month of production in the Chassis number: 18th Position (Excluding the asterisks)

Position of the code for year of production in the Chassis number: 10th Position (Excluding the asterisks)

Height of the Chassis number (Vehicle Identification Number): 7 mm

[Signature]

Karthik Kaliappan

Designation: Product Safety & Compliance Engineer

Date

[Stamp]

Mrs. Rashmi Udfhamareshe
SR. DEPUTY DIRECTOR
HOMOLOGATION MANAGEMENT REGULATION, ARAI PURI
Example of Engine No. :-
DYEM201966

Example of Chassis No. (Vehicle Identification Number) with Month & Year of Manufacture: -
*1XJ435EXHD0100008F*
# DETAILED TECHNICAL SPECIFICATIONS FOR CONSTRUCTION EQUIPMENT VEHICLES

## 1.0 Details of Manufacturer

<table>
<thead>
<tr>
<th>Part</th>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Manufacturer's name and address</td>
<td>Ashok Leyland John Deere Construction Equipment Company Private Limited, No.61, Chinna Obulapuram, Gummipidooi Taluk, Thiruvallur–601201 Tamil Nadu, India</td>
</tr>
<tr>
<td>1.2</td>
<td>Telephone No.</td>
<td>020-66425376/ +91 9922922918 044-6790 2026 / +91-7299997386</td>
</tr>
<tr>
<td>1.3</td>
<td>Fax No.</td>
<td>044-22206001</td>
</tr>
<tr>
<td>1.4</td>
<td>E-mail</td>
<td><a href="mailto:kaliappankarthik@johndeere.com">kaliappankarthik@johndeere.com</a> <a href="mailto:thathaiyanganesan@johndeere.com">thathaiyanganesan@johndeere.com</a></td>
</tr>
<tr>
<td>1.5</td>
<td>Contact person</td>
<td>Karthik Kaliappan Ganesan Thathaiyan</td>
</tr>
</tbody>
</table>

## 2.0 Vehicle Data

<table>
<thead>
<tr>
<th>Part</th>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Basic model</td>
<td>435E</td>
</tr>
<tr>
<td>2.2</td>
<td>Variant(s)</td>
<td>*435E with optional rear tyre 14.00 X 25-20 PR. *435E with optional 0.24 M³ / 0.27 M³ / 0.18 M³ / 0.12 M³ / 0.09 M³ Backhoe Bucket and 0.94 M³/1.0 M³ Loader Bucket</td>
</tr>
<tr>
<td>2.3</td>
<td>Type</td>
<td>Construction Equipment Vehicle- Side shift Loader Backhoe</td>
</tr>
<tr>
<td>2.4</td>
<td>Engine No.</td>
<td>DYEM201966</td>
</tr>
<tr>
<td>2.5</td>
<td>Chassis No.</td>
<td><em>1XJ435EXHD0100008F</em></td>
</tr>
</tbody>
</table>

## 3.0 Performance

<table>
<thead>
<tr>
<th>Part</th>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Max. speed (kmph)</td>
<td>Forward 39.6 Km/hr; Reverse 47.8 Km/hr</td>
</tr>
<tr>
<td>3.2</td>
<td>Stopping distance (m) (From initial speed kmph)</td>
<td>Per CMVR 96A 12.50 m at 80% of 39.6 Km/h</td>
</tr>
<tr>
<td>3.3</td>
<td>Parking brake performance</td>
<td>Hand Lever Medically detailed Operating effort and performance will meet ISO 3450 requirement.</td>
</tr>
<tr>
<td>3.4</td>
<td>Climbing performance (start &amp; stop)</td>
<td>30 degrees</td>
</tr>
<tr>
<td>3.5</td>
<td>Min. turning circle diameter (m)</td>
<td>RH-7.86 LH-8.0</td>
</tr>
</tbody>
</table>

## 4.0 Weights

<table>
<thead>
<tr>
<th>Part</th>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Vehicle kerb weight (kg)</td>
<td>1520-Unladen</td>
</tr>
<tr>
<td>4.1.1</td>
<td>Front axle (FAW1, FAW2 etc.)</td>
<td>5680-Unladen</td>
</tr>
<tr>
<td>4.1.2</td>
<td>Rear axle (RAW1, RAW2 etc.)</td>
<td></td>
</tr>
<tr>
<td>4.1.3</td>
<td>Total</td>
<td>7200</td>
</tr>
</tbody>
</table>

## 5.0 Dimensions

<table>
<thead>
<tr>
<th>Part</th>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Overall length (m)</td>
<td>7.389</td>
</tr>
<tr>
<td>5.2</td>
<td>Overall width (m)</td>
<td>2.237 (2.346(m) - width over bucket)</td>
</tr>
</tbody>
</table>
| Section | Description | Value
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3</td>
<td>Overall height (m)</td>
<td>3.900 (2.922(m)- Height to Top of Cab)</td>
</tr>
<tr>
<td>5.4</td>
<td>Wheel base (m)</td>
<td>2.110</td>
</tr>
<tr>
<td>5.5</td>
<td>Tread (m)</td>
<td></td>
</tr>
<tr>
<td>5.5.1</td>
<td>Front wheel</td>
<td>1.723</td>
</tr>
<tr>
<td>5.5.2</td>
<td>Rear wheel</td>
<td>1.794</td>
</tr>
<tr>
<td>5.6</td>
<td>Min. road clearance (m)</td>
<td>0.354</td>
</tr>
<tr>
<td>5.7</td>
<td>Road clearance from floor (m)</td>
<td>1.150 bottom of cabin floor plate.0.402 from stabilizer bottom plate</td>
</tr>
<tr>
<td>5.8</td>
<td>Body overhang (m)</td>
<td>NA</td>
</tr>
<tr>
<td>5.8.1</td>
<td>Front end</td>
<td>NA</td>
</tr>
<tr>
<td>5.8.2</td>
<td>Rear end</td>
<td>NA</td>
</tr>
<tr>
<td>5.9</td>
<td>Gravity height (m)</td>
<td>1.055</td>
</tr>
<tr>
<td>5.10</td>
<td>Max. stable inclination angle</td>
<td></td>
</tr>
<tr>
<td>5.10.1</td>
<td>Left</td>
<td>30 degrees</td>
</tr>
<tr>
<td>5.10.2</td>
<td>Right</td>
<td>30 degrees</td>
</tr>
<tr>
<td>5.11</td>
<td>Riding capacity</td>
<td>1</td>
</tr>
</tbody>
</table>

### Engine (Parent)

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Type (NA/TC/TCIC, DI/IDI)</td>
<td>TCIC, DI</td>
</tr>
<tr>
<td>6.2</td>
<td>Manufacturer's name &amp; Address of the Manufacturing Plant.</td>
<td>Ashok Leyland, Ennore, Chennai-600057.</td>
</tr>
<tr>
<td>6.3</td>
<td>Working principle (four / two stroke)</td>
<td>Four Stroke</td>
</tr>
<tr>
<td>6.4</td>
<td>Model name and identification</td>
<td>H4CTIC3N</td>
</tr>
<tr>
<td>6.5</td>
<td>Type of fuel used</td>
<td>Diesel</td>
</tr>
<tr>
<td>6.6</td>
<td>No.&amp; Layout of cylinders &amp; firing order</td>
<td>4 cylinder, inline; 1-3-4-2</td>
</tr>
<tr>
<td>6.7</td>
<td>Swept volume (cc)</td>
<td>3839</td>
</tr>
<tr>
<td>6.8</td>
<td>Bore (mm)</td>
<td>104</td>
</tr>
<tr>
<td>6.9</td>
<td>Stroke (mm)</td>
<td>113</td>
</tr>
<tr>
<td>6.10</td>
<td>Compression ratio (specify tolerance)</td>
<td>17.5 +/- 0.5 : 1</td>
</tr>
</tbody>
</table>

### Engine performance (declared by the manufacturer)

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.11.1</td>
<td>Max. Gross power of engine on bench kW (Specify standard and tolerance)</td>
<td>56 kW ± 5%</td>
</tr>
<tr>
<td>6.11.2</td>
<td>Maximum Gross torque on bench Nm @ rpm</td>
<td>350 Nm @1300-4500 rpm</td>
</tr>
<tr>
<td>6.11.3</td>
<td>Engine RPM at max. Power (specify tolerance)</td>
<td>2200 ± 50rpm</td>
</tr>
</tbody>
</table>

**Note:**
In case of diesel engines the max. power and max. torque shall be specified as per conditions given in Chapter 6 of Part IV of Doc. MoSRTH / CMVR / TAP-115 / 116 Issue No. 3.

### Location of engine (Front / Rear)

- Front

### Combustion

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>Type of combustion chamber (Hemispherical / squish/others)</td>
<td>Re-entrant Bowl</td>
</tr>
<tr>
<td>7.2</td>
<td>Drawings of combustion chamber and piston crown (mention drawing no)</td>
<td>Ref Enclosure -1;AL-PUA-H4CTIC3N-01 Part No:FB703742 of Engine report</td>
</tr>
<tr>
<td>7.3.1</td>
<td>Minimum cross section area of ports</td>
<td>NA</td>
</tr>
<tr>
<td>7.3.2</td>
<td>Inlet (mm²)</td>
<td>1300 ± 20</td>
</tr>
<tr>
<td>7.3.2</td>
<td>Outlet (mm²)</td>
<td>900± 20</td>
</tr>
<tr>
<td>8.0</td>
<td>Liquid cooling system</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>---------------------------------------</td>
<td></td>
</tr>
<tr>
<td>8.1</td>
<td>Nature of liquid and capacity</td>
<td>Coolant / 6.0Lts (Engine alone)</td>
</tr>
<tr>
<td>8.2</td>
<td>Circulating pump yes/no</td>
<td>Yes</td>
</tr>
<tr>
<td>8.3</td>
<td>Characteristics of Circulating pump or make(s) &amp; type(s)</td>
<td>Ashok Leyland/AL pump/ Autolec centrifugal type</td>
</tr>
<tr>
<td>8.3.1</td>
<td>Drive ratio</td>
<td>1:1.20(Engine tested without fan)</td>
</tr>
<tr>
<td>8.4</td>
<td>Thermostat type and setting</td>
<td>Wax type thermostat 82-90° C (Full open temp 95° C)</td>
</tr>
<tr>
<td>8.5</td>
<td>Air ducting (std production)</td>
<td>NA</td>
</tr>
<tr>
<td>9.0</td>
<td>Air Cooling system</td>
<td>NA</td>
</tr>
<tr>
<td>9.1</td>
<td>Blower characteristics</td>
<td>-</td>
</tr>
<tr>
<td>9.1.1</td>
<td>Make(s)</td>
<td>-</td>
</tr>
<tr>
<td>9.1.2</td>
<td>Type(s)</td>
<td>-</td>
</tr>
<tr>
<td>9.1.3</td>
<td>Drive ratio(s)</td>
<td>-</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>10.0</th>
<th>Temperature regulating system (yes/no)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1</td>
<td>Brief description</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>11.0</th>
<th>Temperature permitted by manufacturer (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.1</td>
<td>Liquid cooling</td>
</tr>
<tr>
<td>11.1.1</td>
<td>Max. temp. at engine Outlet</td>
</tr>
<tr>
<td>11.2</td>
<td>Air cooling:</td>
</tr>
<tr>
<td>11.2.1</td>
<td>Reference point</td>
</tr>
<tr>
<td>11.2.2</td>
<td>Max. temperature at reference point</td>
</tr>
<tr>
<td>11.3</td>
<td>Max. outlet temperature of the intercooled-air (Location of measurement be specified)</td>
</tr>
<tr>
<td>11.4</td>
<td>Max. exhaust temperature: 650°C (in case of diesel engines, at the point in the exhaust pipe(s) adjacent in outlet flange(s) of exhaust manifolds)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12.0</th>
<th>Fuel temperature (°C) :</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.1</td>
<td>Minimum</td>
</tr>
<tr>
<td>12.2</td>
<td>Maximum</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13.0</th>
<th>Lubricant Temperature (°C) (Location of measurement be specified)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.1</td>
<td>Minimum</td>
</tr>
<tr>
<td>13.2</td>
<td>Maximum</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14.0</th>
<th>Intake system</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.1</td>
<td>Supercharger / Turbocharger – yes/no</td>
</tr>
<tr>
<td>14.1.1</td>
<td>Description of system</td>
</tr>
<tr>
<td>14.1.2</td>
<td>Make(s)</td>
</tr>
<tr>
<td>14.1.3</td>
<td>Type(s) &amp; Part No.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14.2</th>
<th>Intake manifold</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.2.1</td>
<td>Description &amp; Drawings</td>
</tr>
</tbody>
</table>

**Note:** The red stamp and signatory details at the bottom of the page indicate authorization or approval.
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.3</td>
<td>Air filter</td>
<td>Air cleaner: Fleet Guard (or) Equivalent Pre Filter: Donaldson (or) Equivalent</td>
</tr>
<tr>
<td>14.3.1</td>
<td>Make</td>
<td>Radial Seal; Two stage Option: 1 Air Cleaner part no: AT424432 (Super no: 8250773) Option: 2 - F7A03400 Option: 1 Pre cleaner part no: AT405870 (Super no: PB H008858) Option: 2 - 10004338</td>
</tr>
<tr>
<td>14.3.3</td>
<td>Dimensional drawing, with drawing number and part number</td>
<td>Refer enclosure-3 of Engine report</td>
</tr>
<tr>
<td>14.4</td>
<td>Intake silencer</td>
<td>NA</td>
</tr>
<tr>
<td>14.4.1</td>
<td>Make</td>
<td>-</td>
</tr>
<tr>
<td>14.4.2</td>
<td>Type</td>
<td>-</td>
</tr>
<tr>
<td>14.5</td>
<td>Description &amp; dimensional drawing of inlet pipe &amp; their accessories (dash pot, heating device, additional air intake etc.)</td>
<td>Refer enclosure-3 Option: 1 - ETN111458 Option: 2 - D10005321</td>
</tr>
<tr>
<td>14.6</td>
<td>Inter cooler</td>
<td>Modine Thermal Systems Pvt Ltd (or) Equivalent</td>
</tr>
<tr>
<td>14.6.1</td>
<td>Make</td>
<td>Identification Label Part No: AT375888 Supplier No: ICA008894</td>
</tr>
<tr>
<td>14.6.2</td>
<td>Identification mark / &amp; Part No.</td>
<td>Identification Label Part No: AT375888 Supplier No: ICA008894</td>
</tr>
<tr>
<td>15.0</td>
<td>Fuel feed</td>
<td>Direct Injection</td>
</tr>
<tr>
<td>15.1</td>
<td>Injection system description</td>
<td>Direct Injection</td>
</tr>
<tr>
<td>15.2</td>
<td>Working principle: intake manifold/ direct injection/ indirect injection/swirl chamber/others</td>
<td>Direct Injection</td>
</tr>
<tr>
<td>15.3</td>
<td>Fuel Pump</td>
<td>Bosch-India</td>
</tr>
<tr>
<td>15.3.1</td>
<td>Make(s) &amp; Place / Country of origin (if imported)</td>
<td>Idle Speed: 600 Idle Speed: 600 Inline - AL Part No: F7V04100 (Bosch Part No: EB40281800)</td>
</tr>
<tr>
<td>15.3.2</td>
<td>Type(s) &amp; Part No.</td>
<td>Idle Speed: 600 Idle Speed: 600 Inline - AL Part No: F7V04100 (Bosch Part No: EB40286900)</td>
</tr>
<tr>
<td>15.4</td>
<td>Delivery mm³/per stroke at Rated speed and at Max Torque speed (specify tolerance) or characteristic diagram (specify tolerance)</td>
<td>60 ± 3 mm³/st @ 2200 rpm 79 ± 4 mm³/st @ 1300-1500 rpm</td>
</tr>
<tr>
<td>15.5</td>
<td>Calibration procedure on engine/pump bench</td>
<td>On engine</td>
</tr>
<tr>
<td>15.6</td>
<td>Injection timing deg BTDC (specify tolerance)</td>
<td>8° ± 0.5° BTDC</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td>Details</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>15.7</td>
<td>Injection advance curve (attach the same)</td>
<td>NA</td>
</tr>
<tr>
<td>15.8</td>
<td>Injection advance (specify the tolerance)</td>
<td>NA</td>
</tr>
<tr>
<td>15.9</td>
<td>Injectors</td>
<td></td>
</tr>
<tr>
<td>15.9.1</td>
<td>Type, (mention holder, nozzle and assembly no(s))</td>
<td>Multi hole Nozzle; Nozzle holder no:F002C70024 Nozzle no: DSLA 146 P 1465 Bosch Assy part no:F002C7Z120 AL part no:X74 735 00</td>
</tr>
<tr>
<td>15.9.2</td>
<td>Make &amp; country of origin</td>
<td>Bosch- India</td>
</tr>
<tr>
<td>15.9.3</td>
<td>Opening pressure (specify tolerance) or characteristic diagram</td>
<td>248 – 260 bar</td>
</tr>
<tr>
<td>15.9.4</td>
<td>Injection piping</td>
<td>NA</td>
</tr>
<tr>
<td>15.9.5</td>
<td>Length (mm)</td>
<td>600</td>
</tr>
<tr>
<td>15.9.6</td>
<td>Internal diameter (mm)</td>
<td>1.8</td>
</tr>
<tr>
<td>16.0</td>
<td>Device for recycling crank-case gases</td>
<td></td>
</tr>
<tr>
<td>16.1</td>
<td>Description &amp; diagrams</td>
<td>NA</td>
</tr>
<tr>
<td>17.0</td>
<td>Governor</td>
<td></td>
</tr>
<tr>
<td>17.1</td>
<td>Make(s) &amp; country of origin</td>
<td>Bosch-India</td>
</tr>
<tr>
<td>17.2</td>
<td>Type(s)</td>
<td>Mechanical all speed (E B42 2154 00- for 900 rpm &amp; E 042 2171 00- for 600 rpm)</td>
</tr>
<tr>
<td>17.3</td>
<td>Cut off point under load (rpm)</td>
<td>2320 ± 50 rpm</td>
</tr>
<tr>
<td>17.4</td>
<td>Max. Speed without load (rpm)</td>
<td>2370 ± 50 rpm</td>
</tr>
<tr>
<td>17.5</td>
<td>Idle Speed (rpm)</td>
<td>600 / 900 ± 50 rpm</td>
</tr>
<tr>
<td>18.0</td>
<td>Cold start device (starting aid)</td>
<td></td>
</tr>
<tr>
<td>18.1</td>
<td>Make(s)</td>
<td>Beru / Bosch / Beru (Optional)</td>
</tr>
<tr>
<td>18.2</td>
<td>Type(s)</td>
<td>Grid heater / Start Solenoid / Glow Plug (Optional)</td>
</tr>
<tr>
<td>18.3</td>
<td>System description</td>
<td>-</td>
</tr>
<tr>
<td>19.0</td>
<td>Starting System</td>
<td></td>
</tr>
<tr>
<td>19.1</td>
<td>Make(s)</td>
<td>Lucas TVS/Bosch or equivalent</td>
</tr>
<tr>
<td>19.2</td>
<td>Type(s)</td>
<td>12V/24V</td>
</tr>
<tr>
<td>19.3</td>
<td>System description</td>
<td>Pre engaged / Axial Gear Reduction</td>
</tr>
<tr>
<td>20.0</td>
<td>Valve timing / Port timing or equivalent data</td>
<td>Valve timing</td>
</tr>
<tr>
<td>20.1</td>
<td>Max. lift of valves</td>
<td></td>
</tr>
<tr>
<td>20.1.1</td>
<td>Inlet (mm)</td>
<td>12.40mm</td>
</tr>
<tr>
<td>20.1.2</td>
<td>Exhaust (mm)</td>
<td>13.80mm</td>
</tr>
<tr>
<td>20.2</td>
<td>Angle of valves / port (w.r.t. top dead center)</td>
<td>Angle of Valve</td>
</tr>
<tr>
<td>20.3</td>
<td>Inlet</td>
<td></td>
</tr>
<tr>
<td>20.3.1</td>
<td>Opening</td>
<td>18° BTDC</td>
</tr>
<tr>
<td>20.3.2</td>
<td>Closing</td>
<td>30° ABDC</td>
</tr>
<tr>
<td>20.4</td>
<td>Exhaust</td>
<td></td>
</tr>
<tr>
<td>20.4.1</td>
<td>Opening</td>
<td>57° BBDC</td>
</tr>
<tr>
<td>20.4.2</td>
<td>Closing</td>
<td>15° ATDC</td>
</tr>
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<td></td>
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<td>---</td>
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<tr>
<td>20.5</td>
<td>Transfer</td>
<td>NA</td>
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<td>20.5.1</td>
<td>Opening</td>
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<td>20.5.2</td>
<td>Closing</td>
<td>-</td>
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<td>20.6</td>
<td>Reference or setting ranges</td>
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</tr>
<tr>
<td>20.7</td>
<td>Valve gap (Hot &amp; Cold)</td>
<td>Cold</td>
</tr>
<tr>
<td>20.7.1</td>
<td>Inlet</td>
<td>0.30 mm</td>
</tr>
<tr>
<td>20.7.2</td>
<td>Exhaust</td>
<td>0.45 mm</td>
</tr>
<tr>
<td>20.8</td>
<td>Distribution by ports</td>
<td>NA</td>
</tr>
<tr>
<td>20.8.1</td>
<td>Volume of crank-case cavity with piston at TDC</td>
<td>-</td>
</tr>
<tr>
<td>20.8.2</td>
<td>Description of reed valve if any with drawing</td>
<td>-</td>
</tr>
<tr>
<td>20.8.3</td>
<td>Description (with drawing) of inlet ports, scavenging and exhaust ports with corresponding timing. (The drawing should include one representing the inner surface of the cylinder)</td>
<td>-</td>
</tr>
<tr>
<td>21.0</td>
<td>Lubrication system</td>
<td></td>
</tr>
<tr>
<td>21.1</td>
<td>Description of system</td>
<td>Pressurized Oil Lubrication</td>
</tr>
<tr>
<td>21.2</td>
<td>Lubrication oil capacity, lit</td>
<td>8.5</td>
</tr>
<tr>
<td>21.3</td>
<td>Position of lubricant reservoir</td>
<td>Beneath crankcase</td>
</tr>
<tr>
<td>21.4</td>
<td>Lubricating oil grade</td>
<td>SAE 15W40 (or) Equivalent</td>
</tr>
<tr>
<td>21.5</td>
<td>Feed system (pump, injection in to intake mixing with fuel etc.)</td>
<td>Pump</td>
</tr>
<tr>
<td>21.6</td>
<td>Lubricating pump</td>
<td></td>
</tr>
<tr>
<td>21.6.1</td>
<td>Make</td>
<td>Ashok Leyland Ltd</td>
</tr>
<tr>
<td>21.6.2</td>
<td>Type</td>
<td>Gear Pump</td>
</tr>
<tr>
<td>21.7</td>
<td>Mixture with fuel : yes/no, and if yes %</td>
<td>No</td>
</tr>
<tr>
<td>21.8</td>
<td>Oil cooler : yes/no, and if yes Drawings/makes &amp; types</td>
<td>Yes-inbuilt, Plate type water to oil cooler, Poona shims pvt ltd/VORA's HINO/Engine tech &amp; other Equivalent make</td>
</tr>
<tr>
<td>22.0</td>
<td>Electrical equipment</td>
<td></td>
</tr>
<tr>
<td>22.1</td>
<td>Generator/alternator characteristics (specify tolerance) or</td>
<td>Alternator</td>
</tr>
<tr>
<td>22.1.1</td>
<td>Make</td>
<td>Lucas TVS/Bosch or Equivalent</td>
</tr>
<tr>
<td>22.1.2</td>
<td>Type</td>
<td>24V /30A, 55A, 12V /65A, 15A</td>
</tr>
<tr>
<td>23.0</td>
<td>Other engine driven auxiliaries:</td>
<td></td>
</tr>
<tr>
<td>23.1</td>
<td>Enumeration &amp; brief description, if necessary</td>
<td>PTO, air compressor (reciprocating piston type)</td>
</tr>
<tr>
<td>24.0</td>
<td>Idling System</td>
<td></td>
</tr>
<tr>
<td>24.1</td>
<td>Idling speed (rpm) (specify the tolerance)</td>
<td>600 / 900 ± 50 rpm</td>
</tr>
<tr>
<td>24.2</td>
<td>Description of settings and relevant requirements</td>
<td>NA</td>
</tr>
<tr>
<td>25.0</td>
<td>Additional requirements</td>
<td></td>
</tr>
<tr>
<td>25.1</td>
<td>Maximum permitted depression of air intake at characteristic place (Specify location of measurement) (kPa)</td>
<td>4.0 kPa. Measured between Air cleaner &amp; turbocharger compressor inlet</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Measurement 25.2</th>
<th>Exhaust back pressure at maximum Gross power and location of measurement (kPa)</th>
<th>10kPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.3</td>
<td>Effective volume of exhaust system (specify the tolerance &amp; range) in liters (from exhaust manifold / TC outlet to tail pipe end). Enclose the exhaust system drawing and indicate the volume of each parts clearly.</td>
<td>18±2 Litres</td>
</tr>
<tr>
<td></td>
<td>Volume of Muffler Body :13.4 liters ±1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Volume of Exhaust Pipe :4.8 liters ±1%</td>
<td></td>
</tr>
<tr>
<td>25.4</td>
<td>Moment of inertia of combined flywheel &amp; transmission at condition when no gear is engaged</td>
<td>3.81 kg-cm-sec²/5.95 kg-cm-sec²/ 6.36 kg-cm-sec²/ 7.55 kg-cm-sec²/ 11.45 kg-cm-sec² (Engine Alone)</td>
</tr>
<tr>
<td>25.5</td>
<td>Maximum rated speed (Specify the tolerance)</td>
<td>2200 ± 50 rpm</td>
</tr>
<tr>
<td>25.6</td>
<td>Minimum rated speed (Specify the tolerance)</td>
<td>1210 ± 50 rpm</td>
</tr>
<tr>
<td>25.7</td>
<td>Power absorbed by fan kW (specify the tolerance)</td>
<td>Not Applicable- Engine tested without fan</td>
</tr>
<tr>
<td>25.8</td>
<td>Max. Gross torque on bench, Nm@ rpm</td>
<td>~ 350 Nm @ 1300-1500 rpm</td>
</tr>
<tr>
<td>25.9</td>
<td>Declared speed and powers of the engine-submitted for type approval (Speeds to be agreed with the testing agency)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measurement point*</th>
<th>Engine speed rpm</th>
<th>Gross Power kW**</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2200</td>
<td>56</td>
</tr>
<tr>
<td>2</td>
<td>2000</td>
<td>56</td>
</tr>
<tr>
<td>3</td>
<td>1800</td>
<td>57.5</td>
</tr>
<tr>
<td>4</td>
<td>1600</td>
<td>58</td>
</tr>
<tr>
<td>5</td>
<td>1400</td>
<td>51</td>
</tr>
<tr>
<td>6</td>
<td>1210</td>
<td>43</td>
</tr>
</tbody>
</table>


** Gross power according to Chapter 6 of Part IV of Doc.MoSRTHST/CMVR/TAP115/116 Issue No 3.

26.0 Exhaust system:

26.1 Silencer, Number, Type and make

Type:
Opt: 1- Axial flow radial out
Opt: 2- Axial flow axial out
Cummins Exhaust India Limited / Nelson Global Product India Limited (or) Equivalent

26.2 Identification mark (If proprietary) / Part No.

Opt: 1-AT381607, 61017042(Supp.);
Opt: 2- F3950514
Number Plate provided on Muffler.

26.3 Internal dia. of exhaust pipe

123 mm converge to 73 mm. Drawing Enclosed
<table>
<thead>
<tr>
<th>Section</th>
<th>Description (with a general arrangement, dimensional drawing of exhaust system along with its routing indicating the lengths of exhaust pipe, tail pipe and exhaust outlet location)</th>
<th>Engine Exhaust Elbow is connected to Muffler Elbow and it is sealed by using Exhaust Gas Metal ring. Part no: AT425984 Refer Enclosure-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.5</td>
<td>Minimum distance between exhaust pipe(s) and the fuel line</td>
<td>Muffler Body to Fuel Line distance is 52mm.</td>
</tr>
<tr>
<td>27.0</td>
<td>Additional emission control devices, such as catalytic converter etc. (if any &amp; if not covered by another heading)</td>
<td>NA</td>
</tr>
<tr>
<td>27.1</td>
<td>Catalyser make, Number</td>
<td>-</td>
</tr>
<tr>
<td>27.2</td>
<td>Identification Mark / Part No</td>
<td>-</td>
</tr>
<tr>
<td>27.3</td>
<td>Type of catalytic action (One/two/three way)</td>
<td>-</td>
</tr>
<tr>
<td>27.4</td>
<td>Total charge of precious metal (g/vehicle)</td>
<td>-</td>
</tr>
<tr>
<td>27.5</td>
<td>Relative concentration (%)</td>
<td>-</td>
</tr>
<tr>
<td>27.5.1</td>
<td>Platinum</td>
<td>-</td>
</tr>
<tr>
<td>27.5.2</td>
<td>Rhodium</td>
<td>-</td>
</tr>
<tr>
<td>27.5.3</td>
<td>Palladium</td>
<td>-</td>
</tr>
<tr>
<td>27.6</td>
<td>Substrate (Monolythic metal/ Ceramic/honeycomb)</td>
<td>-</td>
</tr>
<tr>
<td>27.7</td>
<td>Cell density (cells per sq. inch)</td>
<td>-</td>
</tr>
<tr>
<td>27.8</td>
<td>Type of casing for catalyser</td>
<td>-</td>
</tr>
<tr>
<td>27.9</td>
<td>Diagram indicating the arrangement and position of catalytic converter w.r.t. exhaust manifold</td>
<td>-</td>
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<tr>
<td>27.10</td>
<td>Electronic Control Unit (ECU)</td>
<td>NA</td>
</tr>
<tr>
<td>27.10.1</td>
<td>Make</td>
<td>-</td>
</tr>
<tr>
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<td>Identification mark</td>
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</tr>
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<td>27.10.3</td>
<td>Calibration Identification No.</td>
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<td>27.11</td>
<td>Secondary Air Injection</td>
<td>Not Provided</td>
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<td>Identification mark</td>
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<td>27.12</td>
<td>Exhaust Gas Recirculating System</td>
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<td>-</td>
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<td>Type</td>
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<td>27.12.3</td>
<td>Identification mark</td>
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<td>28.0</td>
<td>Fuel tank</td>
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<td>Name of producer</td>
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<tr>
<td>28.2</td>
<td>Material</td>
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<td>Capacity</td>
<td>131 L</td>
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<td>28.4</td>
<td>Position</td>
<td>Right side, under cab</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
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</tr>
<tr>
<td>---------</td>
<td>-------------</td>
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<tr>
<td>29.0</td>
<td>Transmission system</td>
<td></td>
</tr>
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<td>29.1</td>
<td>Mechanism from engine to transmission</td>
<td>Input by direct mount via flex plate to the engine</td>
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<td>29.2</td>
<td>Reduction ratio from engine to transmission</td>
<td>1:01</td>
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<tr>
<td>29.3</td>
<td>Clutch</td>
<td>Fluid Clutch-Hydrodynamic Torque Converter</td>
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<tr>
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<td>Name of producer</td>
<td>Carraro</td>
</tr>
<tr>
<td>29.3.2</td>
<td>Type</td>
<td>TLB1-Transmission</td>
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<td>29.3.3</td>
<td>Control system</td>
<td>Fluid Clutch-Hydrodynamic Torque Converter</td>
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<td>Facing</td>
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<td>Name of producer</td>
<td>ZF Sachs</td>
</tr>
<tr>
<td>29.4.2</td>
<td>Dimension (mm)</td>
<td>223mm (Friction Material outer dia)</td>
</tr>
<tr>
<td>29.4.3</td>
<td>Area (cm²)</td>
<td>NA</td>
</tr>
<tr>
<td>29.4.4</td>
<td>Number of operating faces</td>
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</tr>
<tr>
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<td>Material</td>
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<td>Transmission clutch fluid capacity</td>
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<tr>
<td>29.6</td>
<td>Booster type</td>
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<td>Name of producer</td>
<td>NA</td>
</tr>
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<td>29.6.2</td>
<td>Type</td>
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</tr>
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<td>Control system</td>
<td></td>
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<td>30.1</td>
<td>Gear ratio</td>
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<td>30.1.1</td>
<td>Forward 1st</td>
<td>5.603</td>
</tr>
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<td>Forward 2nd</td>
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</tr>
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<td>Forward 3rd</td>
<td>1.585</td>
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<td>30.1.4</td>
<td>Forward 4th</td>
<td>0.793</td>
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<td>Reverse 1st</td>
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<td>Reverse 2nd</td>
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<td>30.1.7</td>
<td>Reverse 3rd</td>
<td>1.313</td>
</tr>
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<td>30.1.8</td>
<td>Reverse 4th</td>
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<td>Gear ratio</td>
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</tr>
<tr>
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<td>Low</td>
<td>NA</td>
</tr>
<tr>
<td>30.4</td>
<td>Propeller shaft</td>
<td>Adjustable length, Sliding Joint</td>
</tr>
</tbody>
</table>
| 30.5    | Length inside & outside diameter, mm | Yoke Centers – 334mm  
Outside Diameter – 76.2mm  
Inside Diameter – 71.38 mm |
<p>| 30.5.1  | 1st | Rear axle driveshaft only |
| 30.5.2  | 2nd | - |
| 30.5.3  | 3rd | - |
| 30.5.4  | 4th | - |
| 30.6    | Universal joint |
| 30.6.1  | Type | Half round bearing, 1410 series, greasable joints |
| 30.6.2  | Number | Tube shaft type with 2 u-joints |</p>
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<tr>
<th>Section</th>
<th>Description</th>
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<td>Crown wheel</td>
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<td>Type</td>
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</tr>
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<td>Differential</td>
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<td>Type</td>
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<tr>
<td>30.9</td>
<td>Running system</td>
</tr>
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<td>30.9.1</td>
<td>Front axle</td>
</tr>
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<td>Type</td>
</tr>
<tr>
<td>30.9.1.2</td>
<td>Toe-in (mm)</td>
</tr>
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<td>30.9.1.3</td>
<td>Camber angle</td>
</tr>
<tr>
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<td>Caster angle</td>
</tr>
<tr>
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<td>King pin angle</td>
</tr>
<tr>
<td>30.9.1.6</td>
<td>Trial (mm)</td>
</tr>
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<td>Rear axle</td>
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<td>Toe-in (mm)</td>
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<td>30.9.2.3</td>
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</tr>
<tr>
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<td>King pin angle</td>
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<td>30.9.2.6</td>
<td>Trial (mm)</td>
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<tr>
<td>31.0</td>
<td>Steering system</td>
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<td>Type</td>
</tr>
<tr>
<td>31.2</td>
<td>Steering wheel Position</td>
</tr>
<tr>
<td>31.3</td>
<td>Outside diameter (mm)</td>
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<tr>
<td>31.4</td>
<td>Maximum number of rotations of steering wheel from lock to lock</td>
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<tr>
<td>31.5</td>
<td>Type of axis &amp; joint</td>
</tr>
<tr>
<td>31.6</td>
<td>Steering gear type</td>
</tr>
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<td>Steering gear ratio</td>
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<td>31.8</td>
<td>Steering angle</td>
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<td>Name of producer</td>
</tr>
<tr>
<td>31.9.2</td>
<td>Type</td>
</tr>
<tr>
<td>31.9.3</td>
<td>Kind of oil</td>
</tr>
<tr>
<td>31.9.4</td>
<td>Oil capacity (l)</td>
</tr>
<tr>
<td>31.10</td>
<td>Locking device</td>
</tr>
<tr>
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<td>Name of producer</td>
</tr>
<tr>
<td>31.10.2</td>
<td>Type</td>
</tr>
<tr>
<td>31.10.3</td>
<td>Mounting position</td>
</tr>
<tr>
<td>32.0</td>
<td>Tyres</td>
</tr>
<tr>
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<td>No. and arrangement of wheels</td>
</tr>
<tr>
<td>32.1.1</td>
<td>Front</td>
</tr>
<tr>
<td>32.1.2</td>
<td>Rear</td>
</tr>
<tr>
<td>32.1.3</td>
<td>Others</td>
</tr>
<tr>
<td>32.2</td>
<td>Tyre type (Radial/cross ply), size &amp; ply rating</td>
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<td>Front wheel</td>
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<td>Section</td>
<td>Description</td>
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<td>Rear wheel</td>
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</tr>
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<td>Rolling radius (mm)</td>
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<td>Inflation pressure – Uniaden (kg/cm² / kPa)</td>
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<td>32.4.1</td>
<td>Front</td>
</tr>
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<td>Rear</td>
</tr>
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<td>32.4.3</td>
<td>Other</td>
</tr>
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<td>Inflation pressure – Laden (kg/cm² / kPa)</td>
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<td>Front</td>
</tr>
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<td>32.5.2</td>
<td>Rear</td>
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<tr>
<td>32.6</td>
<td>Makes:</td>
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<td>32.7</td>
<td>Tread Wear Indicator, Provided (Yes/No)</td>
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<tr>
<td>32.8</td>
<td>Month &amp; Year code of manufacture, Provided (Yes/No)</td>
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<tr>
<td>32.9</td>
<td>Maximum loading capacity, Provided (Yes/No)</td>
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<td>Wheel rim</td>
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<td>33.1</td>
<td>Size</td>
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<td>33.1.3</td>
<td>Others</td>
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<td>Identification mark</td>
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<tr>
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<td>Pitch circle dia. of mounting bolts (mm)</td>
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<td>Number of mounting bolts</td>
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<td>33.6</td>
<td>Material (Steel/ Aluminum alloy etc.)</td>
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<tr>
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<td>Braking system</td>
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<td>Service brake (Description)</td>
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<td>34.2.2</td>
<td>Type</td>
</tr>
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<td>Control system &amp; braking wheel</td>
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<td>---------------------------------</td>
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<td>Dimensions of lining or pad, (L x W x t)</td>
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<td>Area of lining or pad (cm²)</td>
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<td>Brake drum or disc effective diameter (mm)</td>
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<td>Lining or pad</td>
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<td>Master cylinder or brake valve</td>
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<td>Type</td>
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<tr>
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<td>Inner diameter of master cylinder (mm)</td>
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<td>Type of supply tank</td>
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<td>Inner diameter of wheel cylinder or brake piston cap</td>
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<td>Booster</td>
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<td>Type</td>
</tr>
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<td>34.12.3</td>
<td>Magnification</td>
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<td>34.13</td>
<td>Air compressor &amp; others</td>
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<td>Vacuum or air</td>
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<td>34.15</td>
<td>Air pressure (kg/cm²)</td>
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<td>34.16</td>
<td>Type of vacuum pump or air compressor</td>
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<td>Type of pressure regulator</td>
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<td>Material</td>
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<tr>
<td>34.20.1</td>
<td>Make and country of origin (if imported)</td>
</tr>
<tr>
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<td>Identification mark / Part Number</td>
</tr>
<tr>
<td>34.20.3</td>
<td>Length of hose (mm)</td>
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<tr>
<td>34.20.4</td>
<td>Nominal bore diameter (mm)</td>
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<td>34.20.5</td>
<td>End fitting type</td>
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<th>34.22</th>
<th>Braking force (stepping force, kg)</th>
<th>30 w/pedals locked to skid tires</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.23</td>
<td>Type of braking force control system</td>
<td>NA</td>
</tr>
<tr>
<td>34.24</td>
<td>Warning device for braking</td>
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<table>
<thead>
<tr>
<th>34.25</th>
<th>Operation pressure (kg/cm²)</th>
<th>29 to skid tires</th>
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</thead>
<tbody>
<tr>
<td>34.26</td>
<td>Type of safety device</td>
<td>Multi disk wet brakes</td>
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<thead>
<tr>
<th>34.27</th>
<th>Parking brake</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.27.1</td>
<td>Name of producer</td>
</tr>
<tr>
<td></td>
<td>(Handbrake lever supplier: Excel Control linkage Pvt Ltd, Nagpur)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>34.27.2</th>
<th>Type</th>
<th>Manually operated and spring loaded</th>
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<tbody>
<tr>
<td>34.28</td>
<td>Braking wheel</td>
<td>Rear Axle</td>
</tr>
<tr>
<td>34.28.1</td>
<td>Name of producer</td>
<td>Wellman</td>
</tr>
<tr>
<td>34.28.2</td>
<td>Dimension of lining or pad (L x W x t)</td>
<td>NA</td>
</tr>
<tr>
<td>34.28.2.1</td>
<td>Front wheel (mm)</td>
<td>3 friction of plates</td>
</tr>
<tr>
<td>34.28.2.2</td>
<td>Rear wheel (mm)</td>
<td>OD=223mm</td>
</tr>
<tr>
<td>34.28.3</td>
<td>Area of lining pad</td>
<td>ID=163mm, thickness=4.8mm</td>
</tr>
</tbody>
</table>

| 34.28.3.1 | Front | NA |
| 34.28.3.2 | Rear | 2182 cm²-Total |
| 34.28.4 | Material | Sintered (asbestos free) |
| 34.29 | Diameter of brake drum, mm | 194 mm |
| 34.30 | Braking force (Operation force, kg.) | Operating force at hand lever end as per ISO 3450 & ISO 10968 |

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<th>34.31</th>
<th>Auxiliary brake</th>
<th>NA</th>
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<td>Type</td>
<td>-</td>
</tr>
<tr>
<td>34.31.2</td>
<td>Performance</td>
<td>-</td>
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<tr>
<td>34.32</td>
<td>Emergency brake</td>
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<td>34.32.1</td>
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<td>-</td>
</tr>
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<td>34.32.2</td>
<td>Performance</td>
<td>-</td>
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<tr>
<td>34.33</td>
<td>Separate brake</td>
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<td>Section</td>
<td>Description</td>
<td>Details</td>
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<td>---------</td>
<td>--------------------------------------------------</td>
<td>----------------------------------------------</td>
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<tr>
<td>34.33.1</td>
<td>Type</td>
<td>-</td>
</tr>
<tr>
<td>34.33.2</td>
<td>Performance</td>
<td>-</td>
</tr>
<tr>
<td>35.0</td>
<td>Suspension system</td>
<td></td>
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<td>Front axle</td>
<td></td>
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<td>Type of suspension</td>
<td>Pendulum Mount</td>
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<td>Type of spring</td>
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<td>Dimension of main spring (mm)</td>
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<td>Stack</td>
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<td>Flat length</td>
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<td>Free camber</td>
<td>NA</td>
</tr>
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<td>35.1.3.4</td>
<td>Dimension of auxiliary spring</td>
<td>NA</td>
</tr>
<tr>
<td>35.2</td>
<td>Rear axle</td>
<td></td>
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<tr>
<td>35.2.1</td>
<td>Type of suspension</td>
<td>Drive Axle, Direct mount to frame</td>
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<td>Type of spring</td>
<td>NA</td>
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<tr>
<td>35.2.3</td>
<td>Dimension of main spring</td>
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</tr>
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<tr>
<td>35.2.3.3</td>
<td>Free camber</td>
<td>NA</td>
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<td>35.2.3.4</td>
<td>Dimension of auxiliary spring</td>
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</tr>
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<td>35.3</td>
<td>Type of shock absorber</td>
<td>NA</td>
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<td>Front wheel</td>
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<td>Rear wheel</td>
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<td>35.4</td>
<td>Type of stabilizer</td>
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<td>Chassis frame</td>
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<td>Type</td>
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<td>Cross sectional view</td>
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<td>Dimension, mm</td>
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<td>36.4</td>
<td>Type of side protection device</td>
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<td>37.0</td>
<td>Windscreen wiper system</td>
<td>Dual speed with park position</td>
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<td>Windscreen wiper</td>
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<td>37.1.1</td>
<td>Type (manual/power)</td>
<td>Powered</td>
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<td>No. of wipers</td>
<td>1</td>
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<td>Wiper motor</td>
<td></td>
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<td>Name of manufacturer</td>
<td>Prabha Engineering / Alt Supplier: Doga, Italy</td>
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<tr>
<td>37.2.2</td>
<td>Type and identification</td>
<td>Permanent Magnet, 90 degree wipe angle for the front.</td>
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<tr>
<td>37.2.3</td>
<td>Rated voltage</td>
<td>12V</td>
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<tr>
<td>37.2.4</td>
<td>Number of sweep Frequencies</td>
<td>-</td>
</tr>
<tr>
<td>37.2.5</td>
<td>Highest sweep frequency (cycles/min)</td>
<td>52 +/- 3 rpm</td>
</tr>
<tr>
<td>37.2.6</td>
<td>Lowest sweep frequency (cycles/min)</td>
<td>34 +/- 3 rpm</td>
</tr>
<tr>
<td>37.3</td>
<td>Wiper arm</td>
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</tr>
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<td>37.3.1</td>
<td>Length</td>
<td>450 mm</td>
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<td>37.3.2</td>
<td>Manufacturer and Identification</td>
<td>Doga, Italy / Alt Supplier: Syndicate</td>
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<tr>
<td>37.4</td>
<td>Wiper blade</td>
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<td>37.4.1</td>
<td>Length</td>
<td>600 mm</td>
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<td>37.4.2</td>
<td>Manufacturer and Identification</td>
<td>Doga, Italy / Alt Supplier: Syndicate</td>
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<td>37.4.3</td>
<td>Rubber material</td>
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<tr>
<td>37.5</td>
<td>Type of fixing (as per IS 7827)</td>
<td>Screw Type</td>
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<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>37.6</td>
<td>H point</td>
<td></td>
</tr>
<tr>
<td>37.7</td>
<td>Windscreen washing system</td>
<td></td>
</tr>
<tr>
<td>37.8</td>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>37.9</td>
<td>Make</td>
<td></td>
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<td>37.10</td>
<td>Defroster</td>
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<td>37.11</td>
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<tr>
<td>37.12</td>
<td>Make</td>
<td></td>
</tr>
<tr>
<td>37.13</td>
<td>Drawing indicating the seat back angle, seat travel, H point, rake angle, F point, steering wheel position and the related dimensions (Ref: Figure 1 and Figure 2 of AIS-011)</td>
<td>Refer Enclosure-5</td>
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### 38.0 Equipment for Safety

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>38.1</td>
<td>Seat belt anchorages</td>
</tr>
<tr>
<td>38.1.1</td>
<td>Name of producer</td>
</tr>
<tr>
<td>38.1.2</td>
<td>Type</td>
</tr>
<tr>
<td>38.1.3</td>
<td>Number</td>
</tr>
<tr>
<td>38.2</td>
<td>Seat belt</td>
</tr>
<tr>
<td>38.2.1</td>
<td>Name of producer</td>
</tr>
<tr>
<td>38.2.2</td>
<td>Type</td>
</tr>
<tr>
<td>38.2.3</td>
<td>Number</td>
</tr>
<tr>
<td>38.3.1</td>
<td>Head restraint</td>
</tr>
<tr>
<td>38.3.2</td>
<td>Name of producer</td>
</tr>
<tr>
<td>38.3.3</td>
<td>Type</td>
</tr>
<tr>
<td>38.3.4</td>
<td>Number</td>
</tr>
<tr>
<td>38.4</td>
<td>Type of room safety device</td>
</tr>
<tr>
<td>38.5</td>
<td>Type of air conditioner</td>
</tr>
<tr>
<td>38.6</td>
<td>Position of emergency exit</td>
</tr>
<tr>
<td>38.7</td>
<td>Type of device preventing vehicle starting with door opened</td>
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### 39.0 Safety Glass

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<thead>
<tr>
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<tr>
<td>39.1</td>
<td>Front wind shield</td>
</tr>
<tr>
<td>39.1.1</td>
<td>Name of producer</td>
</tr>
<tr>
<td>39.1.2</td>
<td>Type</td>
</tr>
<tr>
<td>39.1.3</td>
<td>Thickness, mm</td>
</tr>
<tr>
<td>39.1.4</td>
<td>Radius of curvature if curved</td>
</tr>
<tr>
<td>39.2</td>
<td>Glasses other than front wind shield</td>
</tr>
<tr>
<td>39.2.1</td>
<td>Name of producer</td>
</tr>
<tr>
<td>39.2.2</td>
<td>Type</td>
</tr>
<tr>
<td>39.2.3</td>
<td>Thickness</td>
</tr>
<tr>
<td>39.2.4</td>
<td>Radius of curvature if curved</td>
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### 40.0 Rear View Mirror

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<tr>
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<tbody>
<tr>
<td>40.1</td>
<td>Left</td>
</tr>
<tr>
<td>40.1.1</td>
<td>Name of producer</td>
</tr>
<tr>
<td>40.1.2</td>
<td>Type</td>
</tr>
<tr>
<td>40.1.3</td>
<td>Dimension &amp; radius of curvature (mm)</td>
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<tr>
<td>40.2</td>
<td>Right</td>
</tr>
<tr>
<td>40.2.1</td>
<td>Name of producer</td>
</tr>
<tr>
<td>40.2.2</td>
<td>Type</td>
</tr>
<tr>
<td>40.2.3</td>
<td>Dimension &amp; radius of curvature (mm)</td>
</tr>
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Manufacturer: Saint-Gobain India / Alt Supplier: Asahi India Glass Limited

Name: Karthik Kaliappan

Designation: Product Safety

Date: 30 Aug 2013

Signatures:
<table>
<thead>
<tr>
<th>40.3</th>
<th>Inside</th>
<th>Manas: 381 x 190 x R1850mm</th>
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<tbody>
<tr>
<td>40.3.1</td>
<td>Name of producer</td>
<td>Manas / Alternate Supplier: Acme</td>
</tr>
<tr>
<td>40.3.2</td>
<td>Type</td>
<td>Convex</td>
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<td>40.3.3</td>
<td>Dimension &amp; radius of curvature (mm)</td>
<td>Acme: 203.2 x 296.7 x R660.4mm Manas: 274 x 185 x R400mm</td>
</tr>
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<table>
<thead>
<tr>
<th>41.0</th>
<th>Horn</th>
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<tr>
<td>41.1</td>
<td>Name of producer</td>
</tr>
<tr>
<td>41.2</td>
<td>Type</td>
</tr>
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<td>41.3</td>
<td>Operating voltage</td>
</tr>
<tr>
<td>41.4</td>
<td>Identification No. / Part No.</td>
</tr>
<tr>
<td>43.5</td>
<td>Number</td>
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<table>
<thead>
<tr>
<th>42.0</th>
<th>Controls (Specify method of operation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>42.1</td>
<td>Ignition</td>
</tr>
<tr>
<td>42.2</td>
<td>Horn</td>
</tr>
<tr>
<td>42.3</td>
<td>Lamps (Head lamp, Tail lamp, Parking lamp and Number plate lamp)</td>
</tr>
<tr>
<td>42.4</td>
<td>Turn signal</td>
</tr>
<tr>
<td>42.5</td>
<td>Transmission shift lever</td>
</tr>
<tr>
<td>42.6</td>
<td>Wind shield wiper</td>
</tr>
<tr>
<td>42.7</td>
<td>High beam/low beam</td>
</tr>
<tr>
<td>42.8</td>
<td>Parking brake</td>
</tr>
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<td>42.9</td>
<td>Master switch for electrical</td>
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<td>42.10</td>
<td>Hazard warning signal</td>
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<td>Service Brake</td>
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<td>42.12</td>
<td>Accelerator Pedal (Floor hinged/hanging type)</td>
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<td>Others</td>
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<table>
<thead>
<tr>
<th>43.0</th>
<th>Displays and tell tales</th>
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<tr>
<td>43.1</td>
<td>Head lamp – upper / lower control</td>
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<tr>
<td><strong>43.2</strong></td>
<td><strong>Ignition cut-off</strong></td>
</tr>
<tr>
<td></td>
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<tr>
<td><strong>43.3</strong></td>
<td><strong>Turn signal</strong></td>
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<td><strong>43.4</strong></td>
<td><strong>Fuel Gauge</strong></td>
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<tr>
<td><strong>43.7</strong></td>
<td><strong>High beam indicator</strong></td>
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<td><strong>43.8</strong></td>
<td><strong>Electrical charge indicator</strong></td>
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### Auto lamps (bulbs)

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<th><strong>Auto lamps (bulbs)</strong></th>
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<tr>
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<td>Head lamp bulb (main and dip)</td>
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<tr>
<td>44.1.1</td>
<td>Make and Country of origin (if imported)</td>
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</tr>
<tr>
<td>44.2</td>
<td>Parking Lamp bulb - Front</td>
</tr>
<tr>
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<td>Make and Country of origin (if imported)</td>
</tr>
<tr>
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<tr>
<td>44.3</td>
<td>Parking Lamp bulb - Rear</td>
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<tr>
<td>44.4</td>
<td>Direction indicator lamp bulb - front</td>
</tr>
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<td>Make and Country of origin (if imported)</td>
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<tr>
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<td>Direction indicator lamp bulb - rear</td>
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<td>Make and Country of origin (if imported)</td>
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<td>Direction indicator lamp bulb - side</td>
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<td>Make and Country of origin (if imported)</td>
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<td><strong>Front Position Lamp bulb</strong></td>
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<td>Make and Country of origin (if imported)</td>
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<tr>
<td>44.8</td>
<td><strong>Rear Position Lamp (tail lamp) Bulb</strong></td>
</tr>
<tr>
<td>44.8.1</td>
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<td><strong>Stop lamp bulb</strong></td>
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<td>44.11</td>
<td><strong>End out Marker bulb</strong></td>
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<td>Make and Country of origin (if imported)</td>
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<tr>
<td>44.12</td>
<td><strong>Reversing lamp bulb</strong></td>
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<td>44.13</td>
<td>Stop Lamp Bulb (S3)</td>
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<td>44.14</td>
<td>Front Fog Lamp Bulb</td>
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<td>44.15</td>
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<td>44.16</td>
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</table>

45.0 **Lighting equipment**

| 45.1 | Head lamp |
| 45.1.1 | Main beam |
| 45.1.2.1 | Dipped beam |

| 45.1.1.1 | Make and Country of origin (if imported) | Neolite ZKW / Hilux |
| 45.1.1.2 | Type of lens (Glass / Plastic) | Glass |
| 45.1.1.3 | Identification No. / Part No. | NEO 155/ HI-LUX HL-560 |
| 45.1.1.4 | Number and Colour of Lens | 2 No's and Clear Glass |
| 45.1.2 | Dipped beam |
| 45.1.2.1 | Make and Country of origin (if imported) | Neolite ZKW / Hilux |
| 45.1.2.2 | Type of lens (Glass / Plastic) | Glass |
| 45.1.2.3 | Identification No. / Part No. | NEO 155/ HI-LUX HL-560 |
| 45.1.2.4 | Number and Colour of Lens | 2 No's and Clear Glass |

| 45.2 | Front Fog Lamp |
| 45.2.1 | Make and Country of origin (if imported) | NA |
| 45.2.2 | Type of lens (Glass / Plastic) | NA |
| 45.2.3 | Identification No. / Part No. | NA |
| 45.2.4 | Number and Colour of Lens | NA |

5.3.1 | Make and Country of origin (if imported) | NA |
| 5.3.2 | Type of lens (Glass / Plastic) | NA |
| 5.3.3 | Identification No. / Part No. | NA |
| 5.3.4 | Number and Colour of Lens | NA |

45.4 **Side Marker lamps**

| 45.4.1 | Make and Country of origin (if imported) | NA |
| 45.4.2 | Type of lens (Glass / Plastic) | NA |
| 45.4.3 | Identification No. / Part No. | NA |
| 45.4.4 | Number and colour of Lens | NA |

45.5 **Registration Plate lamp**

| 45.5.1 | Make and Country of origin (if imported) | Neolite ZKW / Hilux |
| 45.5.2 | Type of lens (Glass / Plastic) | Plastic |
| 45.5.3 | Identification No. / Part No. | PPI-216-217 (Neolite) / HI-LUX HL-566 |
| 45.5.4 | Number and colour of Lens | 2 No's and White |

45.6 **Position lamp / Parking Lamp - Front**

| 45.6.1 | Front Position Lamp |
| 45.6.1.1 | Make and Country of origin (if imported) |

Provided in Head Lamp Assy-12T4W

Provided
<table>
<thead>
<tr>
<th>45.6.1.2</th>
<th>Type of lens (Glass / Plastic)</th>
<th>Glass</th>
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<tbody>
<tr>
<td>45.6.1.3</td>
<td>Identification No. / Part No.</td>
<td>NEO 155/ HI-LUX HL-560</td>
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<tr>
<td>45.6.1.4</td>
<td>Number and colour of Lens</td>
<td>2 No's and Clear Glass</td>
</tr>
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</table>

**45.6.2 Front Parking Lamp**

| 45.6.2.1 | Make and Country of origin (if imported) | Neolite ZKW / Hilux |
| 45.6.2.2 | Type of lens (Glass / Plastic) | Glass |
| 45.6.2.3 | Identification No. / Part No. | NEO 155/ HI-LUX HL-560 |
| 45.6.2.4 | Number and colour of Lens | Provided |

**45.7 Position lamp / Parking Lamp - Rear**

| 45.7.1 | Rear Position Lamp | Provided in Rear Combination Lamp |
| 45.7.1.1 | Make and Country of origin (if imported) | Neolite ZKW / Hilux |
| 45.7.1.2 | Type of lens (Glass / Plastic) | Plastic |
| 45.7.1.3 | Identification No. / Part No. | PPI-216-217 (Neolite) / HI-LUX HL-566 |
| 45.7.1.4 | Number and colour of Lens | 2 No's and Red |

**45.7.2 Rear Parking Lamp**

| 45.7.2.1 | Make and Country of origin (if imported) | Neolite ZKW / Hilux |
| 45.7.2.2 | Type of lens (Glass / Plastic) | Plastic |
| 45.7.2.3 | Identification No. / Part No. | PPI-216-217 (Neolite) / HI-LUX HL-566 |
| 45.7.2.4 | Number and colour of Lens | 2 No's and Red |

**45.8 Stop lamp (S1 / S2)**

| 45.8.1 | Make and Country of origin (if imported) | Neolite ZKW / Hilux |
| 45.8.2 | Type of lens (Glass / Plastic) | Plastic |
| 45.8.3 | Identification No. / Part No. | PPI-216-217 (Neolite) / HI-LUX HL-566 |
| 45.8.4 | Number and colour of Lens | 2 No's and Red |

**45.9 Stop lamp (S3) for M1 category**

| 45.9.1 | Make and Country of origin (if imported) | NA |
| 45.9.2 | Type of lens (Glass / Plastic) | - |
| 45.9.3 | Identification No. / Part No. | - |
| 45.9.4 | Number and colour of Lens | - |

**45.10 Reversing lamp**

| 45.10.1 | Make and Country of origin (if imported) | Neolite ZKW / Hilux |
| 45.10.2 | Type of lens (Glass / Plastic) | Plastic |
| 45.10.3 | Identification No. / Part No. | PPI-216-217 (Neolite) / HI-LUX HL-566 |
| 45.10.4 | Number and colour of Lens | 2 No's and White |

**45.11 Direction indicator Lamp**

| 45.11.1 | Make and Country of origin (if imported) | Neolite ZKW / Hilux |
| 45.11.1 | Type of lens (Glass / Plastic) | Plastic |
| 45.11.1 | Identification No. / Part No. | NEO 155/ HI-LUX HL-560 |
| 45.11.1 | Number and colour of Lens | 2 No's and Amber |
| 45.11.2 | Rear | Provided |

**45.11 Direction indicator Lamp**

<p>| 45.11.3 | Make and Country of origin (if imported) | Neolite ZKW / Hilux |
| 45.11.3 | Type of lens (Glass / Plastic) | Plastic |
| 45.11.3 | Identification No. / Part No. | PPI-216-217 (Neolite) / HI-LUX HL-566 |
| 45.11.3 | Number and colour of Lens | 2 No's and White |</p>
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<tr>
<th>Code</th>
<th>Description</th>
<th>Details</th>
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<td>45.11.3</td>
<td>Number and colour of Lens</td>
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<td>45.11.4</td>
<td>Type of flasher</td>
<td>Electronic Flasher</td>
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<tr>
<td>45.12</td>
<td>Hazard warning signal</td>
<td>Direction Indicators itself act as emergency signaling equipment</td>
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<tr>
<td>45.12.1</td>
<td>Front</td>
<td>Provided -12P21W</td>
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<tr>
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<td>Make and Country of origin (if imported)</td>
<td>Neoite ZKW / HI-LUX Auto Electric Pvt. Ltd</td>
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<td>Name of producer</td>
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<td>Capacity of producer</td>
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<td>Max. Pressure for use (kg/cm²)</td>
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<td>Material</td>
<td>NA</td>
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<td>List of spare tools normally given with the vehicle</td>
<td>Refer Enclosure-6</td>
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<td>48.0</td>
<td>Additional information, if any</td>
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</table>
ESSENTIAL CHARACTERISTICS OF THE ENGINE FAMILY

1.0 Common Parameters
1.1. Combustion cycle: 4 Stroke
1.2. Cooling medium: Water
1.3. Method of air aspiration: Turbo charged with intercooler
1.4. Combustion chamber type/design: Re-entrant type
1.5. Valve and porting - configuration, size and number: Overhead configuration with 2 valves per cylinder
1.6. Fuel system: In-Line pump
1.7. Engine management systems:
   - Proof of identity pursuant to drawing number(s):
   - Charge cooling system: CAC (Inter cooler)
   - Exhaust gas recirculation (2): NA
   - Water injection/emulsion (2): NA
   - Air injection (2): NA
1.8. Exhaust after-treatment system (2):
   - Proof of identical (or lowest for the parent engine) ratio: system capacity/fuel delivery per stroke, pursuant to diagram number(s): NA

2.0 Engine Family Listing
2.1. Name of engine family: H4CTIC3
2.2. Specification of engines within this family: H4CTIC3N Parent Engine

<table>
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<th>Engine Type</th>
<th>Parent engine</th>
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<tbody>
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<td>No of cylinders</td>
<td>4</td>
</tr>
<tr>
<td>Rated speed (rpm)</td>
<td>2200±50</td>
</tr>
<tr>
<td>Rated Gross power (kW)</td>
<td>56±5%</td>
</tr>
<tr>
<td>Maximum torque speed (rpm)</td>
<td>1300-1500</td>
</tr>
<tr>
<td>Fuel delivery per stroke at Rated Speed (mm3)</td>
<td>60 ± 3</td>
</tr>
<tr>
<td>Fuel delivery per stroke at Max Torque Speed (mm3)</td>
<td>79 ± 3</td>
</tr>
<tr>
<td>Maximum torque (Nm)</td>
<td>350</td>
</tr>
<tr>
<td>Low idle speed (rpm)</td>
<td>600/900±50</td>
</tr>
<tr>
<td>Cylinder displacement (in % of parent engine)</td>
<td>100%</td>
</tr>
</tbody>
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(1) To be completed in conjunction with the specifications given in Annexure II
(2) If not applicable mark n.a.
ASHOK LEYLAND LTD

LEYLAND

DESCRIPTION
MODEL
DRAWING REF. NO
DRAWN BY / DT
CHECKED BY / DT
APPROVED BY / DT

COMPRESSION RATION : 17.5
ALL DIMENSIONS ARE IN MM

PISTON
H4CTICON ENGINE
AL - PUA - H4CTICON - 01
GB/250812
SMG/250812

30 AUG 2013

Mrs. RASHMI UPADHWAresh
SR. DEPUTY DIRECTOR
HOMOLOGATION, MANAGEMENT & REGULATION, ARAI, PUNE

John Deere India Private Limited
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