Andhra Pradesh State Road Transport Corporation
Office of the Managing Director, Bus Bhavan, Hyderabad - 500 0624.

No: OP5/462(2)/2013-MED

# CIRCULAR No.12/2013-MED, Dated 19.06.2013

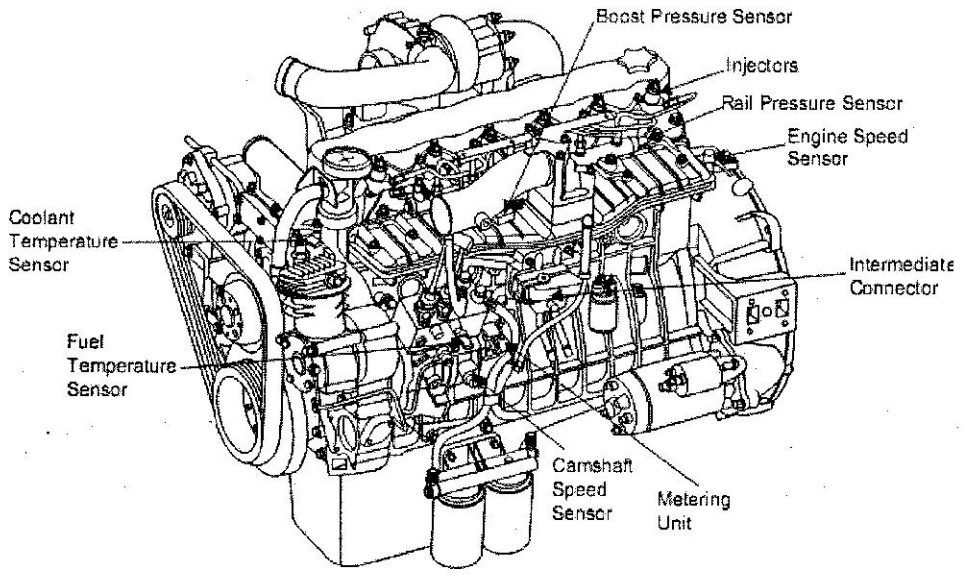
Sub: MAINTENANCE - Introduction of **Ashok Leyland BS-4 compliant Buses in Twin Cities** - Salient features and maintenance aspects communicated - Reg.

1.00 Corporation has recently introduced **Ashok Leyland 222"Wheel Base, 165 HP - BSIV - ALPSV 4/151 Buses** in the selective Depots in Hyderabad & Sec-bad Twin Cities as new product to meet the emission norms.

2.00 The salient technical specifications, features & maintenance systems of these buses are furnished hereunder.

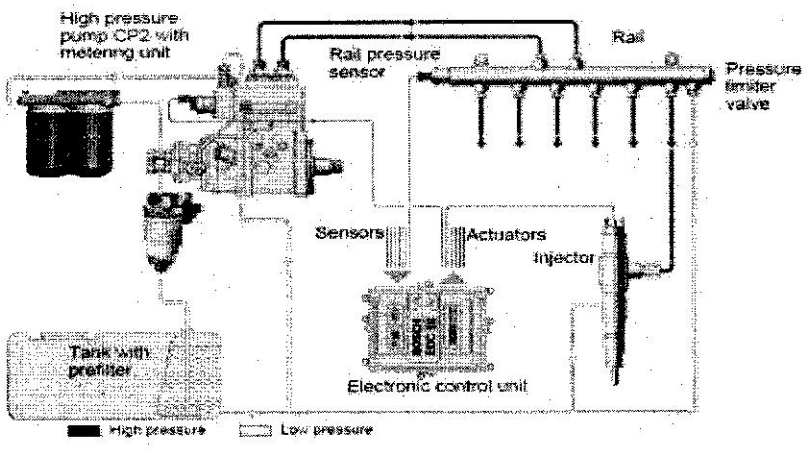
3.00 **Engine**

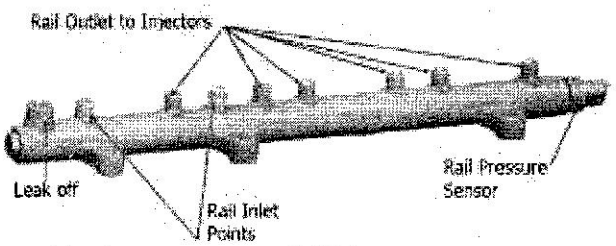
- Bus Model: **ALPSV 4/151**
- Engine Model: 'H' Series H6E4S123 Engine - 6 Cylinder BS4 Turbocharged Intercooled with Common Rail Diesel Injection system
- Max. Power: 165 HP (123Kw) @2500 rpm
- Max. Torque: 550 Nm @1200-1800 rpm
- Cylinder Bore x Stroke: 104 x 113 mm
- Capacity: 5.759 lit
- Cylinder Liners: Dry type
- Compression Ratio: 17.5:1
- Firing order: 1-4-2-6-3-5
- Valve clearance: Intake - 0.30 mm (0.012"), Exhaust - 0.45 mm (0.018")



4.00 **Fuel System**

- Common Rail Diesel Injection system of BOSCH
  High pressure Pump: CPN 2.2 (Diesel suction depend on gear pump which is mounted at rear side of the High pressure pump and there is no feed pump arrangement provided)
- Governor: Electronic Control Unit for Fuel Injection Equipment (There are no control lever and mechanical linkages in FIE)
- Injector: Timing controlled by electrical signals to the injector solenoid.
- Rail pressure: 1400-1600 bar
- Hand primer: Mounted on chassis LH side of the engine
- Fuel filter / Water separator built with secondary hand primer
- EDC system: EDC 16
- Fuel Filters: Fuel filter cum water separator is fitted after the hand primer and Spin on type fuel filters are fitted at the low pressure side before HP Pump.
- Fuel tank capacity: 239 Lts



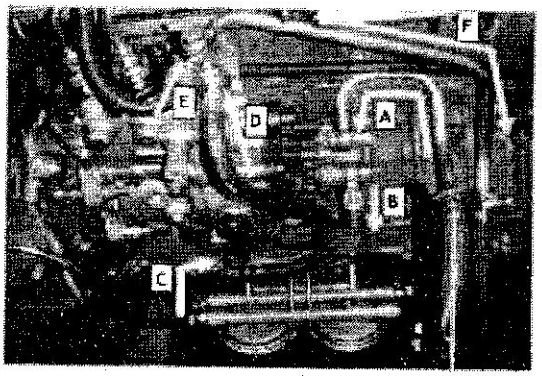

Following are the critical components of CRS system.

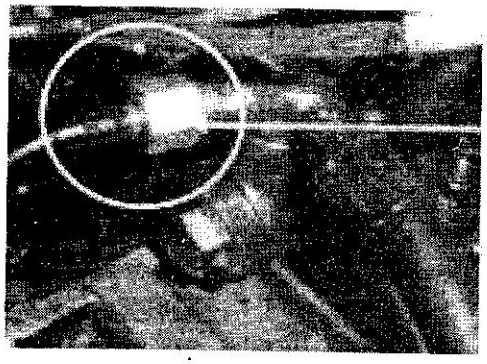
1. High Pressure Pump (CPN2.2)
2. Rail
3. Injector
4. Sensors
   - Engine speed sensor
   - Coolant temperature sensor
   - Boost pressure sensor
   - Common Rail pressure sensor
   - Camshaft Position Sensor / Phase sensor
   - Fuel temperature sensor
   - Accelerator pedal sensor
   - Vehicle speed sensor
   - Water level (in Fuel-Water Separator) sensor

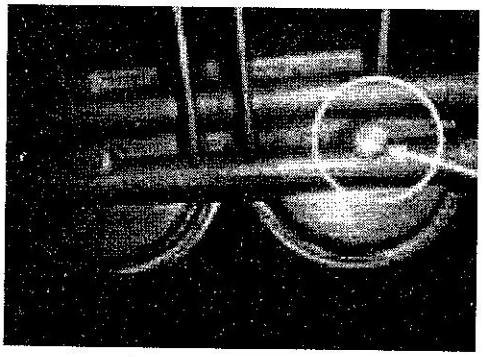
5. Electronic Control Unit (EDC 16)

**Bleeding procedure:** Bleeding is to be done by using Hand primer only and **DO NOT BLEED THE ENGINE IN RUNNING CONDITION** as the high pressure(1400 bar) of Common Rail may cause injuries. The fuel lines and bleeding procedure in fuel system to be done as explained below.

A- Fuel inlet to feed pump
B- From feed pump out let, To main filter inlet
C:D-Main filter outlet to CR Pump inlet
E- Fuel return from injector & Rail to pump fuel return
F- Fuel return to tank

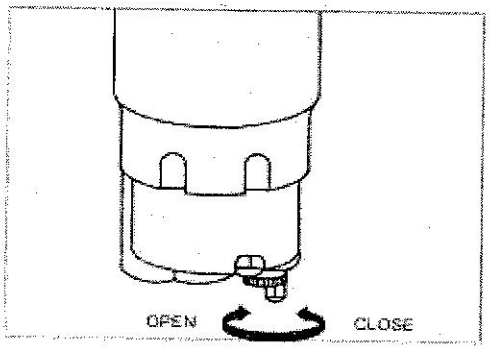


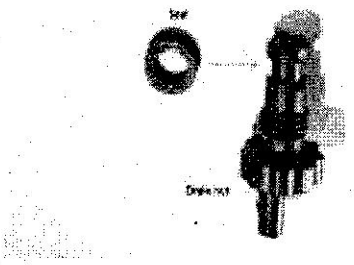


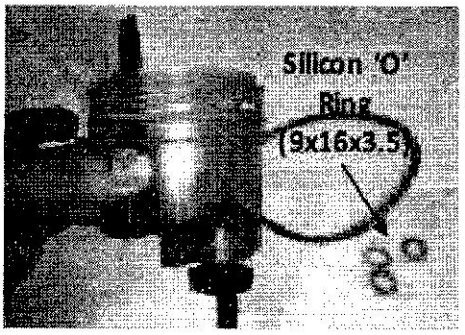
➢ The air in to be bleed from spin on twin filters top bolt and from the return Line on H.P Pump as shown above.

➢ Precaution to be taken while draining accumulated water daily from fuel filter cum water separator and the direction to drain is as shown below.




➢ Water will be drained out once the drain nut will rotate from RH to LH side (facing the filter in front of) and Drain nut will be tight once rotate drain nut from LH to RH.





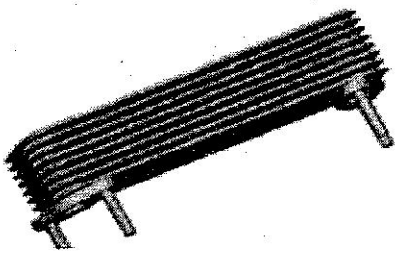

➢ Over tightening will result in Drain nut 'O' ring damage and diesel oil leakage will occur which will lead to air lock. If 'O' ring is damaged the silicon 'O' ring of size (9 x16 x 3.5) is to be used.

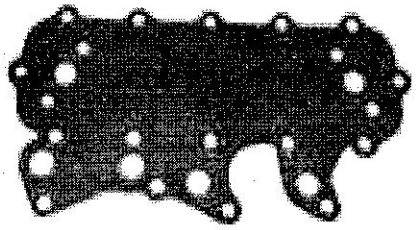
5.00 **Air Intake System**

- Air cleaner: Dry type two stage Air filters with Service Indicator
- Turbocharger(TC): Radial flow and Waste gate arrangement

➢ Do not apply Anabond at the joints for packing of lubricating pipes as the remains of Anabond will block the passages of full floating TC shaft bushes and due lack of lubrication the TC fails. Use the recommended gasket only.

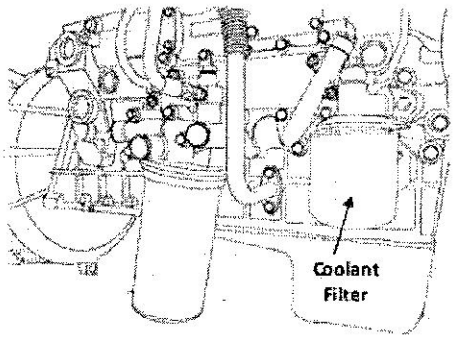
6.00 **Lubrication system**: Full flow pressure circulation is similar to the existing BS-III model vehicles. In order to increase heat dissipation capacity of engine oil the no. of plates on the oil cooler is increased from 5 to 8.





➢ A modified compressed asbestos gasket (Steel plate sandwitched) is used for these oil coolers and the old BS-III gasket should not be used.

7.00 **Cooling system:** Same as that of existing vehicles. Fan is with integral ring for strength. The fan belt is of poly V grooves type.




➢ Always maintain the coolant level to MAX position marked on DAT tank
➢ Recommended coolant in 1:1 ratio should be used to avoid overheating and tank rusting complaints
➢ Check & ensure the working stroke of thermostat (7.5mm at 95C) with the help of Vernier Caliper.
➢ Change the coolant filter at every 2,00,000 kms

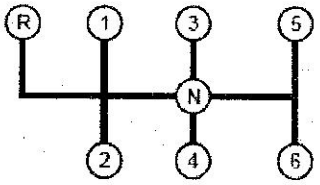
8.00 **Clutch**

Mechanical linkage clutch operating system with 353 mm Dia Single Plate Dry Type clutch disc - Organic lining

9.00 **Transmission**

- Type: ZF-S6 36 Six speed Synchromesh Gear Box
- No. of speeds: 6 forward (including overdrive) and 1 reverse
- Gear Ratio: $1^{st}$ - 6.93, $2^{nd}$ - 4.43, $3^{rd}$ - 2.63, $4^{th}$ - 1.51, $5^{th}$ - 1, $6^{th}$ (OD) - 0.84, Reverse - 6.22

Gear shift lay out




10.00 **Front Axle**

- Type:ALFA-90, Heavy duty forged I Beam, Reverse Elliot type

11.00 **Rear Axle**

- Type: 60SHO-Dana, Fully floating single reduction hypoid gear Heavy duty pressed beam banjo type
- Gear Ratio: 6.17:1

12.00 **Steering**

- ZF/Rane Power Steering

13.00 **Suspension**

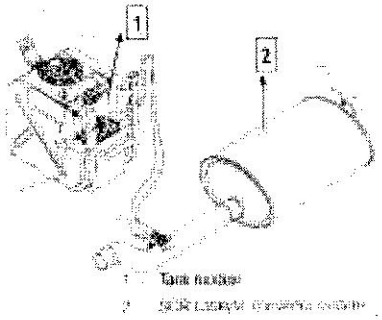
- Front & Rear- Rubber ended leaf spring
- Front rubber element- 3" width
- Rear rubber element- 4" width

14.00 **Brakes**

1) Foot operated Engine Exhaust brake
2) Service brake
   - Type: S'cam dual Air brake system with Air with Dryer
   - Air compressor: 230cc water cooled
   - Slack adjuster: Automatic
   - Front Brake Lining width : 7 inches
   - Rear Brake Lining width : 8 inches
   - Brake Drum Sizes: 15.5 inches (393 mm)

15.00 **SCR(Selective catalytic Reduction) system:** This technology uses unique Exhaust gas after treatment equipment to limit NOx gases within BS-IV norms. By selectively adding the reducing agent called AdBlue® into catalytic converter the aqueous Urea solution (32.7%) decomposes into ammonia with which the harmful nitrogen oxides are converted to non toxic nitrogen and water.

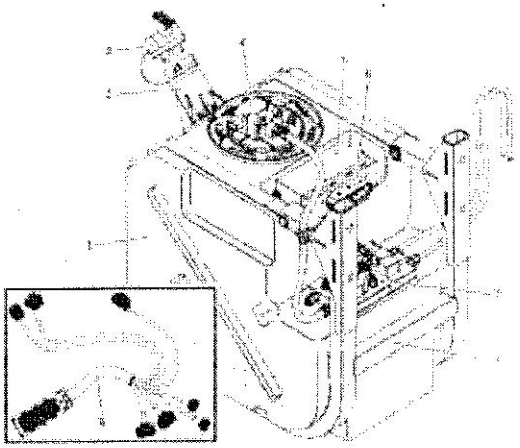
The SCR system consists of two modules




1. Tank Module consisting of tank bracket, AdBlue® tank, Dosing unit, Level sensor, control unit and cable harness.

2. Catalytic converter system with SCR housing, hydrolysis pipe, injector nozzle and exhaust gas temperature sensors.

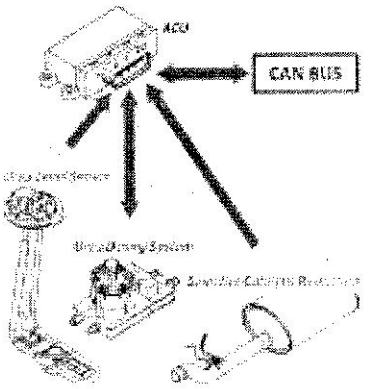
**Tank Module:**

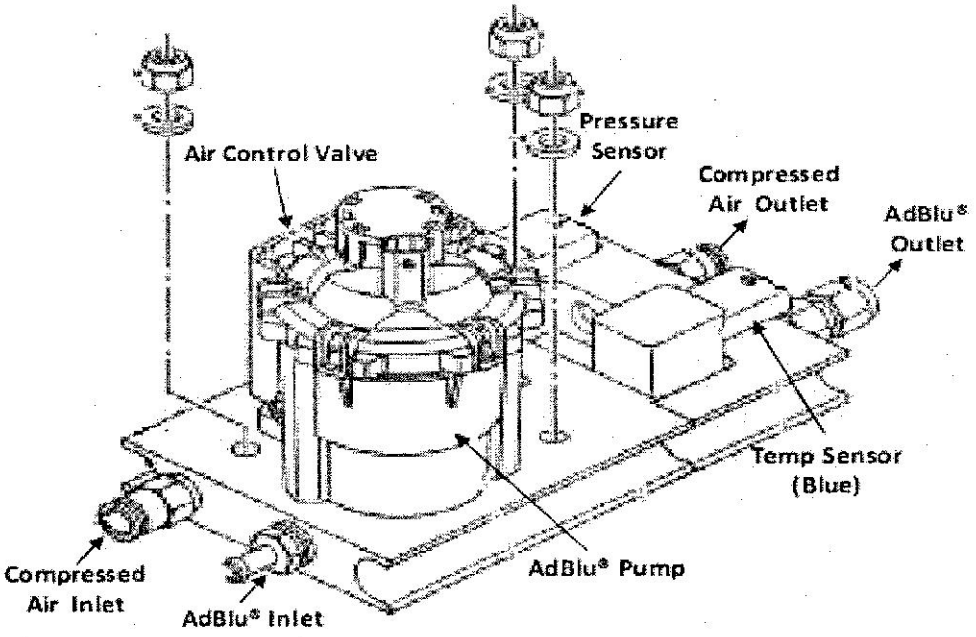


1. AdBlu® Tank
2. Filler Neck
3. Lockable cover with Breather
4. Level sensor
5. Control Unit
6. Access Control Unit(ACU)
7. Dosing Unit(UDS)
8. Tank Bracket
9. Cable Harness(Plugged)

- The AdBlue® Tank is mounted to RH side of chassis with brackets and the tank is made up of tough plastic of approximately 46 Lts capacity. The usable tank capacity is 40 Lts. The level gauge is provided on right hand corner of the instrument panel and the level of minimum 10% should be maintained.
- The lockable cover/cap with breather should be locked intact after top up to prevent entry of moisture and foreign material which will damage the SCR system.
- The Level sensor is located inside the tank and is mounted on the tank from the top using a mounting flange. The suction pipe is fitted with a filter. It provides information about the level & temperature.

- The Dosing unit (UDS) and the control unit (ACU) are mounted to the outside of the tank.
- The control unit is mounted on the shock absorbers to the tank using self locking nuts. The control unit (ACU) processes information from level sensor (Temperature & level), the Dosing unit, the temperature sensors in the catalytic converter system and information of the engine control unit from the vehicle via CAN bus.



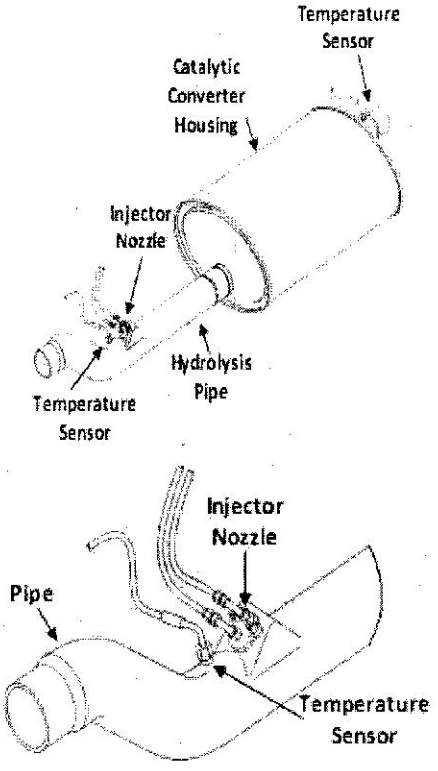



- The Dosing unit is mounted on the shock absorbers to the tank using self locking nuts. The control unit (ACU) provides information about the quantity of AdBlu® to the dosing unit. The defined quantity is then transported to the injector nozzle of the dosing unit using the dosing pump. The sensors of the dosing unit simultaneously send information back to the controlling unit ensuring a continuous communication between the dosing & control units.

- The SCR catalytic converter consists of SCR housing, hydrolysis pipe, injector nozzle and exhaust gas temperature sensors.

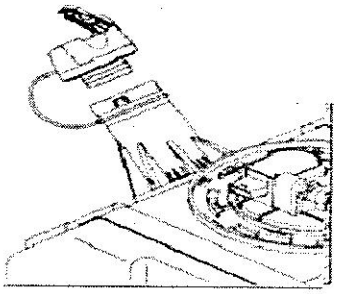
- The hydrolysis pipe is made up of Stainless steel and the air supply line, Injector and Temperature sensor are located inside. The injector nozzle delivers defined quantities of AdBlu® of 50-5000 gms/hour as high quality spray for complete hydrolysis. The high temperature in hydrolysis pipe allows conversion of AdBlu® to ammonia.

- In catalytic converter the formed ammonia reacts with the harmful nitrogen oxides & oxygen to form non toxic nitrogen and water which are released to the atmosphere. Vanadium acts as Catalyst in this process.

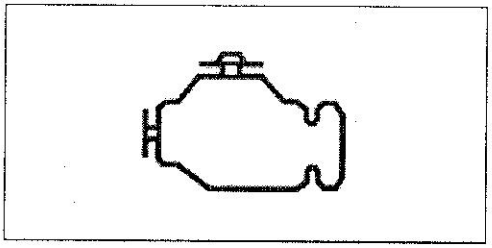


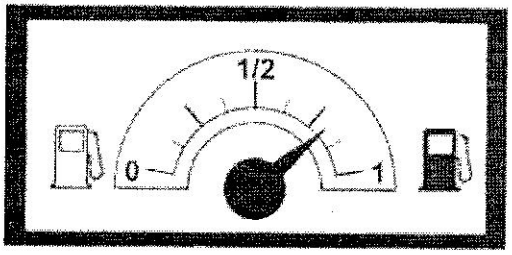
- The cable harness is plugged in completely. The cable connector lengths are dissimilar & are coded differently thus cannot be interchanged.
- Filling AdBlue:
  - The tank cap is fastened to the tank neck using a loop and secured against Spillage. The tank cap is secured with a lock. The delivery includes 2 keys. After filling, screw the tank caps back on to the tank neck.

- **Caution:** The tank cap is provided with ventilation. The tank cap should be replaced only with original accessories with ventilation.



Control lamp in the dashboard






- Malfunction indicator lamp (MIL) shows any malfunction on vehicle. Use Diagnostic tool to read the error code from the control unit. Check Ad Blue tank display first.
- Ad blue level gauge: The level gauge is mounted RH side of the instrumental panel shows actual level available in the gauge is equipped with a reserve lamp indicating to be filled soon. Reserve lamp will glow below 7 Ltrs. Below to this level reserve lamp will also glow. The gauge Ad Blue should be maintained always above 10%.
- Important Note:
  - Torque will be limited once Ad Blue level drops to 10% which is called LIMPHOME mode. Ensure to maintain the Ad Blue level always above 10%.
- Special Instructions:
  - SCR system is maintenance free. It has to be checked at regular intervals.

- Risks of Burns:
  - The exhaust system is very hot during operation. Allow the system to cool down completely before working on the SCR system.

16.00 **Wheel & Tyre**

- Size: 9.00 N20 - 14PR
- Wheel rim: 7.5HD X 20
- Balanced wheels (Provided wheel balancing weights)

17.00 **Electrical system**

- Battery: 2 x 12v - 150 AH
- Alternator: 24v 55A
- Starter type: LUCAS-TVS make 7M14 Axial Starter Motor

18.00 **Performance**

- Max Speed: 87 kmph
- Grade ability: 27.3 %

19.00 **RECOMMENDED LUBRICANTS, COOLANT & CLUTCH FLUID**

| Aggregate | Specification | Gulf Oil Product Name | IOCL Product Name | Capacity |
|---|---|---|---|---|
| Engine Oil | API CI-4, SAE15W40 | Gulf Super fleet LE Dura Max 15W-40 | Servo pride Alt plus 15W40 | 16 ltr |
| Gear Box oil | SAE 80W90 API GL5 | Gulf Gear XP Dura Max 80W-90 | Servo Gear ALT 80W-90 (LL) | 6.5 Ltrs |
| Differential Oil | SAE 85W140 API GL5 | Gulf Gear DB Dura Max 85W-140 | Servo Gear Axle ALT 85W-140 | 14 ltr |
| Power Steering oil | DEXTRON IID | Gulf Power Steering Dura Max | Servo Transdex II | Rane /ZF 4 /4.5ltr |
| Clutch Fluid | FMVSS DOT3 | Gulf Clutch Fluid Max | Servo Power Brake ALT | 1 ltr |
| Wheel Brg Grease | IS 12203 | Gulf Crown Max RR 3 | Servo Gem ALT | 4 kg |
| Coolant | | Eurocool LL max 50 | Servo Kool ALT 50 | 22 ltr |

20.00 **MAINTENANCE SCHEDULES**

The specific maintenance activities applicable for BS-IV buses (other than those stipulated in the regular Sch-I/II, III/IV and FC) are furnished hereunder.

| LUBRICANTS, COOLANT & FILTERS CHANGE PERIODICITIES | | |
|---|---|---|
| 1 | Change Engine Oil & Filter | First change at 16,000 km and thereafter every 40,000 km |
| 2 | Fuel filter cum Water separator replacement | 40,000 kms |
| 3 | Both Fuel filter elements (Engine mounted, Spin on) replacement | 40,000 kms |
| 4 | Replace Gear Box oil | 1,20,000 kms |
| 5 | Replace Differential Gear oil | 80,000 kms |
| 6 | Replace Power Steering Oil filter | 80,000 kms |
| | Replace Power Steering Oil | 1,60,000 kms |
| 7 | Replace Wheel Bearing Grease (RR3) | 48,000 kms |

| | | |
|---|---|---|
| 8 | Air Cleaner Primary replacement | Whenever the vacuum indicator shows redband |
| 9 | Air Cleaner safety replacement | At the time of every third replacement of primary filter element |
| 10 | Antifreeze Coolant replacement (applicable for Recommended coolant (pre-mixed) with coolant filter | 2,00,000 kms |
| 11 | Change clutch fluid | 40,000 kms |
| 12 | Change coolant filter | 72,000 kms |
| 13 | Ad Blu suction filter | Every 1,00,000 kms or 2 years which ever is earlier |

## 21.00 PREVENTIVE MAINTENANCE SCHEDULES

| Description of Activity | Sch-I | Sch-II | Sch-III | Sch-IV |
|---|---|---|---|---|
| | Daily | Weekly | | |
| **ENGINE** | | | | |
| Check Engine oil level & arrest leakage if necessary | ✓ | ✓ | ✓ | ✓ |
| Check & adjust Valve clearance | | | | ✓ |
| Check and tighten front and rear engine mounting / other peripheral bolts | | | ✓ | ✓ |
| Check Damper Pulley and attend if necessary | | | ✓ | ✓ |
| Drain water from Water separator | 3-6 hours after a fresh fill of the diesel tank / Daily | | | |
| Clean Fuel tank inside & Tank strainer | | | | ✓ |
| Check function of radiator cap | | ✓ | ✓ | ✓ |
| Check Fan belts for damage/looseness | ✓ | ✓ | ✓ | ✓ |
| Check Exhaust pipes and mounting | | | ✓ | ✓ |
| Check Radiator coolant level | ✓ | ✓ | ✓ | ✓ |
| **ELECTRONIC DIESEL CONTROL** | | | | |
| Check for engine full acceleration (Throttle response | ✓ | ✓ | ✓ | ✓ |
| Check tightness of all mating connectors and ensure they are connected properly | | | ✓ | ✓ |
| Check and secure wiring harness away from temperature zones on the engine/vehicle | | | ✓ | ✓ |
| Check functioning of EDC and sensors with diagnostic tool | | | | ✓ |
| Check tightness of engine speed sensors and clean the sensor tip for any dirt/dust deposits | | | ✓ | ✓ |
| Check functioning of warning EDC light | ✓ | ✓ | ✓ | ✓ |
| **TURBOCHARGER & INTERCOOLER** | | | | |
| Check Air duct connections, hoses and gaskets | | | ✓ | ✓ |
| Check charge air cooler for any blockage of fins and clean the cooler if necessary (2.5 kg/cm2) | | | | ✓ |
| **CLUTCH** | | | | |
| Check function of clutch system | | ✓ | ✓ | ✓ |

| | | | | |
|---|---|---|---|---|
| Check Clutch pedal free play | | ✓ | ✓ | ✓ |
| Check and adjust clutch pressure plate height using 'H' gauge | | | ✓ | ✓ |
| **TRANSMISSION** | | | | |
| Check Gear box oil level | ✓ | ✓ | ✓ | ✓ |
| Check Looseness in gear control mechanism | | ✓ | ✓ | ✓ |
| **PROPELLER SHAFT** | | | | |
| Check Propeller shaft nuts tightness | ✓ | ✓ | ✓ | ✓ |
| Check Universal joint and splines for wear | | ✓ | ✓ | ✓ |
| Universal joint and splines Greasing | | ✓ | ✓ | ✓ |

| Description of Activity | Sch-I Daily | Sch-II Weekly | Sch-III | Sch-IV |
|---|---|---|---|---|
| **SUSPENSION** | | | | |
| Check Suspension U-bolt / nuts tightness | | ✓ | ✓ | ✓ |
| Check Wavellar Brackets/Bolts for tighteness | ✓ | ✓ | ✓ | ✓ |
| Check for broken/sagging spring leaves | ✓ | ✓ | ✓ | ✓ |
| Check wavellar rubber elements for damage | ✓ | ✓ | ✓ | ✓ |
| **REAR AXLE** | | | | |
| Check Differential gear oil level | ✓ | ✓ | ✓ | ✓ |
| Check Axle case for damage and distortion | | | | ✓ |
| **FRONT AXLE** | | | | |
| Check for Damage and distortion | | | | ✓ |
| Lubricate King Pins | | ✓ | ✓ | ✓ |
| Wheel Disc for damage OR balance weight missing | | | ✓ | ✓ |
| **STEERING** | | | | |
| Check Power steering fluid level (When engine is in idle i.e. 500-600 rpm ) | ✓ | ✓ | ✓ | ✓ |
| Check Power steering fluid tank strainer | | | ✓ | ✓ |
| Check Looseness in mounting | | | ✓ | ✓ |
| Check Bearings for excessive play | | | ✓ | ✓ |
| Check for Steering linkage for damage, looseness and excessive play | | ✓ | ✓ | ✓ |
| Check Clearance between knuckle, King Pin and front axle | | | ✓ | ✓ |
| Check & adjust Wheel alignment | | | ✓ | ✓ |
| **SERVICE BRAKE** | | | | |
| Check Brake Lining wear | | ✓ | ✓ | ✓ |
| Check Brake drum for wear and damage | | | ✓ | ✓ |
| Check Function of dual brake valve | | | ✓ | ✓ |
| Check Air hoses and pipes for leakage, damage and loose connections | ✓ | ✓ | ✓ | ✓ |
| Check Cams and wheel brakes for excessive wear | | | | ✓ |
| Check function of Brake actuator, slack adjuster and actuator rod stroke | | | ✓ | ✓ |
| Replace Air dryer desiccant | **Once in a year** | | | |

| Description of Activity | Sch-I Daily | Sch-II Weekly | Sch-III | Sch-IV |
|---|---|---|---|---|
| **ELECTRICAL EQUIPMENT** | | | | |
| Check Battery Specific gravity | | ✓ | ✓ | ✓ |
| Check Function of starter motor | | | ✓ | ✓ |
| Starter motor brushes for wear | | | | ✓ |
| Check Function of Alternator | | | ✓ | ✓ |
| Check Terminal of wiring harness for damage and looseness | | | ✓ | ✓ |
| **CHASSIS LUBRICATION** | | | | |
| Lubricate all Grease points* | | ✓ | ✓ | ✓ |
| **TYRES** | | | | |
| Check Tyre inflation pressures | | ✓ | ✓ | ✓ |
| Remove Trapped stones, replace Tyres at 2mm NSD | ✓ | ✓ | ✓ | ✓ |
| Tyre rotation and Wheel nuts | | | ✓ | ✓ |
| **SCR SYSTEM** | | | | |
| **Check AdBlu® level gauge and replenish** | ✓ | ✓ | ✓ | ✓ |
| **Check air pressure leakages if any** | ✓ | ✓ | ✓ | ✓ |
| **Check for tightness of AdBlu® Tank, Dosing pump & SCR housing mounting brackets & Nuts** | | | ✓ | ✓ |
| **Check function of Dosing pump** | | | ✓ | ✓ |
| **Check for wiring harness for loose/damage** | | | ✓ | ✓ |
| **Replace AdBlu® suction filter** | **Every 1,00,000 kms or 2 years whichever is earlier** | | | |

22.00 **ESSENTIAL SPARES TO BE STOCKED AT DEPOTS**

The list of essential spare parts to be stocked at Depots for maintenance is shown at annexure

23.00 **ADDITIONAL TOOLS REQUIRED FOR MAINTENANCE**

| S.NO | PART NAME | PART NO |
|---|---|---|
| 1 | Special tool for 14" clutch | 0201007 |
| 2 | Diagnostic Tester - BS III/IV Tool Kit | FN201100 |

24.00 The Dy.CMEs are advised to educate the staff on operation and maintenance of BS-IV buses at the depots duly providing necessary tools required for day to day maintenance. They are also advised to monitor the performance of BS-IV buses and furnish the feedback to Head Office at regular intervals.

25.00 The Controllers of Stores are advised to supply required spare parts to the Depots duly fixing the limits in consultation with respective Dy.CMEs.

26.00 The Depot Managers and Maintenance incharges are advised to ensure proper maintenance to the vehicles and see that the vehicles are utilized to the full extent without any breakdown.

VICE CHAIRMAN & MANAGING DIRECTOR

To

All Depot Managers

Copy to: Dir (V&S), ED(E&IT), ED (O&MIS), ED (A&P), FA, CAO, ED (HRD&Med) for infn.

Copt to: ED (GHZ&HZ), ED (HYD), ED (KRMR), ED (VJA), ED (VZM), ED(NLR), ED(KDP) for information.

Copy to: All RMs for information.

Copy to: CME (O), CCOS, CA, CFM, CME(C&B), CE (IT), CPM, CM (HRD) for information & n/action.

Copy to:DyCME (O), DyCME (P), DyCME(C&B), DyCME (IED), DyCAO (SP&A), CSTO, COS(C) I & II for information.

Copy to: DyCMEs, WM, COS & DyCAOs of GHZ for necessary action.

Copy to: All AOs & AMEs (T) for information & n/action.

Copy to: All Principals of ZSTCs, BTC, HPT & TA/HPT for information.

Copy to: Resident Audit Officer, Bus Bhavan, Hyd for information.

Copy to: In-charge, Manual Section for record.

ANNEXURE

## LIST OF ESSENTIAL SPARES TO BE STOCKED AT DEPOT FOR AL BS-IV BUSES

| Sl no | Part no | Part Description | Qty per Depot (100 Veh) |
|---|---|---|---|
| 1 | A2N06400 | ASSY OF BS4 ENGINE WITH SCR | 1 |
| 2 | X1711400 | CYLINDER HEAD GASKET MULTI-LAYERED STEEL | 5 |
| 3 | F1100160 | OIL FILLER CAP | 5 |
| 4 | B8785401 | S/A OF CYLINDER HEAD COMP OF ITEMS MARKED | 1 |
| 5 | FD000444 | RADIATOR TTRL - VIKING 120KW IL BSIII & VIKING 135KW LT BSIII | 3 |
| 6 | F1002600 | PLASTIC DEAERATION TANK | 5 |
| 7 | FB504314 | PIPE - THERMOSTAT OUTLET TO RADIATOR INLET | 5 |
| 8 | FB504414 | PIPE - RADIATOR OULET TO WATER PUMP INLET | 5 |
| 9 | F8P04558 | RADIATOR INLET PIPE HOSE - ENGINE SIDE | 5 |
| 10 | F8P13358 | STRAIGHT HOSE - RADIATOR PIPING | 5 |
| 11 | F8P04658 | RADAITOR OUTLET PIPE HOSE - ENGINE SIDE | 5 |
| 12 | F8P08758 | RADIATOR HOSE | 5 |
| 13 | X7409000 | 520 MM DIA FAN FOR W06DTI ENGI | 5 |
| 14 | B8220402 | CLUTCH ASSY F/L FAN (SUB - B8220406,B8220408) | 3 |
| 15 | P0996151 | DRY TYPE AIR FILTER KIT | 25 |
| 16 | F8211200 | PRIMARY AIR FILTER | 50 |
| 17 | F8211300 | SECONDARY AIR FILTER | 50 |
| 18 | F8600750 | HOSE ELBOW 127.5 ID | 5 |
| 19 | F1988450 | REDUCER ELBOW HOSE | 5 |
| 20 | F8273900 | VACUUM INDICATOR (25") | 5 |
| 21 | F2604200 | METACONE MOUNTING | 5 |
| 22 | F2630200 | MOUNTING PAD FOR FRONT MTG | 5 |
| 23 | B1301501 | S/A OF 14"RDC CLUTCH COVER | 3 |
| 24 | B1304804 | 14" CLUTCH DISC ASSY WITH VALEO F510 FACING | 5 |
| 25 | F3032422 | CLUTCH BACK PLATE | 5 |
| 26 | B1301503 | WITHDRAWAL PLATE | 5 |
| 27 | P0941651 | CLUTCH REPAIR KIT | 5 |
| 28 | P0957351 | RDC SPRING KIT - 4 FINGER | 5 |
| 29 | P0919651 | CLUTCH BUSH PIN KIT | 5 |
| 30 | B1301504 | S/A OF RETAINER SPRING | 5 |
| 31 | F2414811 | CLUTCH OPERATING LEVER | 3 |
| 32 | F7117522 | CLUTCH OPERATING LEVER BRACKET | 3 |
| 33 | F0900400 | BALL PILLAR | 5 |
| 34 | F3421522 | CLUTCH WITHDRAWAL SLEEVE | 5 |
| 35 | F8P02400 | THERMOPLASTIC COPOLYESTER TUBE 170MM LENGTH | 25 |
| 36 | B1E02701 | GEAR JOINT ASSY | 5 |
| 37 | F1106450 | GEAR SHIFT GAITER | 5 |
| 38 | B1531602 | S/A OF CONNECTION FLANGE | 5 |
| 39 | F8319500 | BALL JOINT ASSEMBLY LH | 10 |

| Sl no | Part no | Part Description | Qty per Depot (100 Veh) |
|---|---|---|---|
| 40 | F8319400 | BALL JOINT ASSEMBLY RH | 10 |
| 41 | FK715315 | REACTION ROD | 3 |
| 42 | F9H01111 | EXTENDED OUTER LEVER WITHOUT MACHINING PITCH 55 MM | 13 |
| 43 | F2717500 | OIL SEAL (REAR) | 5 |
| 44 | P4500451 | U/J KIT | 10 |
| 45 | P4501939 | C/B.& RETAINER | 10 |
| 46 | F0257010 | CENTRE BRG ASSY | 10 |
| 47 | FC700914 | PROPELLER SHAFT -FIRST SHAFT | 1 |
| 48 | FC701114 | PROPELLER SHAFT- SECOND | 1 |
| 49 | P2410339 | S/A OF DRAG LINK | 3 |
| 50 | P2405051 | DRAGLINK MAJOR KIT | 5 |
| 51 | F4513710 | FRONT SPRING ASSY | 3 |
| 52 | F0130150 | RUBBER ELEMENT | 5 |
| 53 | FD300215 | REAR SPRING | 3 |
| 54 | F0130350 | RUBBER ELEMENT | 5 |
| 55 | P3258545 | 1ST LEAF SPRINF | 5 |
| 56 | P3258645 | 2ND LEAF SPRING | 5 |
| 57 | P3258745 | 3RD LEAF SPRING | 5 |
| 58 | P4317151 | BRAKE LINING KIT - 7 HLP " | 10 |
| 59 | P4301936 | RETURN SPRING-BRAKE SHOE | 10 |
| 60 | P4317351 | 8" HLP BRK LINING KIT | 10 |
| 61 | X7489400 | PRE-FILTER WITH WATER SEPERATOR, M AND H MAKE-CRS APP | 5 |
| 62 | B7F00328 | UREA TANK ASSEMBLY | 1 |
| 63 | B7F00305 | UREA TANK | 3 |
| 64 | B7F00318 | HOSE SET SQUARE TANK | 3 |
| 65 | B7F00320 | HOSE SET NOZZLE | 3 |
| 66 | B7F00334 | 1.5M AIR HOSE SET | 3 |
| 67 | B7F00335 | 1.5M AD BLUE HOSE SET | 3 |
| 68 | B7F00330 | 1.5M AIR HOSE | 3 |
| 69 | B7F00331 | 1.5M AD BLUE HOSE | 3 |
| 70 | FA400500 | O RING UREA LEVEL SENSOR | 5 |
| 71 | FM806000 | SCR ACU VEHICLE INTERFACE WIRE HARNESS | 1 |
| 72 | FF400500 | TEMPERATURE SENSOR - SCR | 5 |
| 73 | FM805900 | CAN BACKBONE WIRE HARNESS | 1 |
| 74 | F4L00700 | UREA FILLER CAP | 5 |
| 75 | F6N01900 | ACU - 123KW H6 ENGINE | 1 |
| 76 | FF400600 | UREA LEVEL SENSOR (SCR) | 1 |
| 77 | FM707300 | SCR WIRE HARNESS (ALBONAIR) | 1 |
| 78 | DFADBLUE | Ad Blue 210 Ltrs | 50 |