



**Andhra Pradesh State Road Transport Corporation**  
**Mechanical Engineering Department**  
**Office of the VC & MD, Bus Bhavan, Hyderabad - 624.**

No : OP2/581(15)/2009-MED

**CIRCULAR No: 23/2009-MED, Dt.30.09.2009**

Sub: **HSD KMPL** - Observance of Fortnight - 'Fuel saving campaign on BS-II vehicles' from 16<sup>th</sup> Oct'2009 to 31<sup>st</sup> Oct'2009 - Certain instructions issued - Reg.

**1.00 INTRODUCTION**

- 1.01 For many decades we have been operating both Tata & Ashok Leyland vehicles with engines of lesser horse power ranging from 90 to 100 h.p. With the imposition of stringent emission norms by the Government, the corporation had to procure the vehicles that comply with the prevailing emission standards abiding the Motor Vehicle Rules. In order to meet the higher emission standards, it is necessary for the vehicle manufacturers to switch over to engines of greater horse power than the old versions. Obviously, Tata BS-II Vehicles with 130 hp and Ashok Leyland BS-II vehicles with 114 hp have been supplied to the depots. The total population of BS-II vehicles in the Corporation has now reached to 4,785 nos which has a great impact on the HSD kmpl performance.
- 1.02 In the initial stages of introducing of these high horse power vehicles, there was a wrong perception among the field staff that these vehicles were less fuel efficient and difficult to achieve the HSD Kmpl what was achieved on the earlier models. But this notion was proved wrong by conducting several test drives and practical demonstrations. The Drivers upon learning the driving techniques of BS-II vehicles achieved a kmpl as high as 5.70 in the prevailing conditions without compromising with the occupancy. Keeping this in view, several training campaigns were organized in the regions on BS-II vehicles with the help of vehicle manufactures which has ultimately resulted in significant improvement in the fuel performance of BS-II vehicles.
- 1.03 But the review of type-wise/ engine-wise HSD kmpl upto Aug'09 reveals that the misconception on fuel performance of BS-II vehicles still persists at many places and there is every need to elude the myths on the performance of BS-II vehicles completely so that the Corporation can achieve the target in HSD KMPL with the improvement in BS-II kmpl.
- 1.04 Further, the thrust on improving HSD KMPL attained greater significance owing to steep hike in Diesel prices in the recent months and volatility in the global crude oil prices. The corporation is not in a position to sustain any additional impact of power expenditure in the prevailing circumstances and there is no other go but to improve its fuel efficiency by all means.

## **2.00 OBSERVANCE OF FORTNIGHT - 'FUEL SAVING CAMPAIGN ON BS-II VEHICLES'**

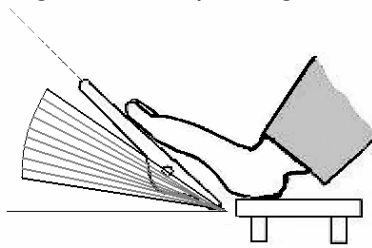
- 2.01 As there is vast scope for improvement of fuel performance of BS-II & other high end vehicles, it is proposed to organize a special campaign for a complete fortnight on creating awareness on getting the best performance out of BS-II vehicles in the similar manner as the 'Tyre Care Fortnight' was conducted recently.
- 2.02 This fortnight is called as 'Fuel saving campaign on BS-II vehicles' commencing from 16<sup>th</sup> October 2009. The basic objective of this campaign is aimed at achieving the maximum fuel efficiency from the BS-II vehicles by creating awareness among the field staff, by providing the required technical inputs, strengthening the maintenance and providing material support from the stores/ workshops.
- 2.03 The observance of fortnight, 'Fuel saving campaign on BS-II vehicles' shall be made on the following broad guidelines.

## **3.00 EDUCATION**

Organize intense publicity campaign by distributing the pamphlets & display of flexi banners etc informing about

- The current Diesel prices, CPK on fuel of the Depot and its percentage on total expenditure.
- The impact of 0.10 improvement in HSD KMPL of BS-II vehicles on the overall performance of the Depot because of its higher volume of operation and saving in terms of amount.
- the scope for improvement in HSD KMPL of BS-II vehicles exemplifying the highest kmpl achieved by the BS-II vehicles in the Depot and at Regional level.
- The potential for improvement based on route-wise & vehicle type-wise bench mark kmpl for BS-II
- Momentum mode driving methods - i.e. the engine power has to be utilized to attain optimum speed and there after the vehicle has to run in cruising speed with the help of vehicle momentum, keeping accelerator pedal in no.3 position
- Avoid shifting to the lower gears unnecessarily without judging the vehicle momentum. Since, BS-II vehicles are equipped with high torque engines, the need for shifting to lower gears at the time of slow down is very minimum.

- Acceleration by soft touch - Illustrating total pedal travel in terms of angle in degrees and explaining the range of speed that can be achieved in different gears by pressing the pedal from 45 to 0 degrees of angle. Emphasize that pressing the pedal unnecessarily to zero degree position (Flat) when there is no demand for power from wheels (which are rotating at slow speed) is mere waste of fuel.



- Use of RPM meter while driving (wherever available) and maintaining the engine r.p.m within the Green band in all gears.
- Judicious application of brakes. Slowing down the vehicle without applying the brakes by anticipating the stops
- Avoid long idling at bus stations and bus stops.
- Technical aspects that influence the fuel performance
- Any other relevant literature that can influence the drivers and maintenance staff in getting good kmpl from the BS-II vehicles in particular.

#### **4.00 DRIVERS TRAINING & PRACTICAL DEMONSTRATIONS**

- 4.01 Chalk out a precise schedule for training all the Drivers who operate BS-II vehicles prioritizing the drivers based on individual kmpl.
- 4.02 The Training consists of two sessions, i.e, class room session for 3 hours and on-hand training for half a day. The Depot Manager shall address the Class room training and explain the Drivers about the fuel conservation techniques on BS-II vehicles duly displaying the 'Indhanam' video. The Dy.CME of the region shall address the Drivers at least one session at each depot during the fortnight.
- 4.03 The practical training will be conducted by Safety Instructor in presence of the Depot Maintenance incharge for about half a day throughout the fortnight.
- 4.04 Utilize the PJ Driving Instructor as a nodal person in Drivers Training at various depots in the region.
- 4.05 Organize an oral evaluation test on the final day of the drive, select three best trainees and felicitate them.

#### **5.00 VEHICLE MAINTENANCE**

- 5.01 Special attention shall be paid to rectification of defects on BS-II vehicles during this fortnight with due focus on improvement of HSD kmpl.
- 5.02 Check the working condition of Injector Pressure Tester, Torque wrench, Magnetic based Dial Gauge, Tyre pressure gauges and get them calibrated if required
- 5.02 Check availability of feeler gauges with all mechanics, replace if worn out
- 5.02 Ensure dry hub setting using dial gauge for all vehicles
- 5.02 Identify the BS-II vehicles which are consistently giving low kmpl irrespective of the Driver and route operated. Test drive the vehicle by the Safety Instructor or any high KMPL driver along with the KMPL Mechanic & Maintenance Supervisor, find out the reasons for low kmpl and rectify them.

5.02 Carry out 100% inspection of the following items on BS-II vehicles

- Tyre Inflation pressures
- Fitment of Radials as per guidelines
- Air leakage
- Brake condition
- Free rolling of wheels
- Wheel alignment
- Self condition
- Head Lights, signal lights & Wind screen wiper working condition
- Visibility of Windscreen glass, vision mirror
- Condition of Driver Seat & seat adjustment mechanism
- Working condition of RPM meter
- Condition of Accelerator pedal and its linkages
- Provision of proper foot rest near the pedals in Driver's cabin
- Engine tuning - Valve clearance, Injector pressure, FIP timing, Cyl Head nuts tightness (wherever applicable), engine compression, Air intake system, Exhaust back pressure, Idling r.p.m etc
- Fuel leakages, condition of strainers (Baby filters) & Fuel filters
- Condition of Clutch plate, pressure plate, flywheel, release bearing, master cylinder, slave cylinder etc.
- Chassis lubrication
- Condition of Gear Box & Gear shifting mechanism
- Any other relevant items connected to improvement of HSD kmpl.

1.01 Draw the required spares & units for kmpl improvement from the Zonal Stores/ Zonal Workshops by planning in advance

2.01 Monitor the performance of vehicles, Obtain the feedback from the drivers and review the performance of the vehicle after attention on daily basis during the fortnight

**6.00 COUNSELLING**

6.01 The Depot Manager shall counsel all the Drivers operating BS-II vehicles whose performance is less than the route/type-wise target. The counseling shall be interactive and proactive.

6.02 Monitor the performance of the counseled Drivers on daily basis during the fortnight.

6.03 The Dy.CME shall also counsel at least 10 lowest kmpl drivers of the Depot who operate BS-II vehicles during the fortnight.

**7.00** The Regional Managers are advised to bestow their personal attention in making the 'Fuel saving campaign on BS-II vehicles' a success in their regions and visit the depots for ensuring the implementation of the instructions with true spirit.

**8.00** The Regional Managers are advised to conduct an exclusive meeting with the Dy.CMEs, Depot Managers, Maintenance incharges, PJ Driving Instructors & Safety Instructors during the Fortnight to review activities taken up at the depots.

- 9.00** The Executive Directors of the Zones are advised to ensure effective implementation of the Fortnight and issue necessary instructions to the Zonal Stores and Workshops to plan for adequate supply of spares, tools, Units and other materials to meet the demand from the Depots. In order to create competitive spirit among the Depots, a best depot will be identified in each region on effective implementation of the instructions during the fortnight and appreciation letters by the VC & MD will be issued to the Depot Manager & Maintenance Incharge of the Depot where there is maximum improvement in the HSD KMPL of BS-II during the month of Oct'09 over that of previous month.
- 10.00** The Regional Managers are advised to send the detailed compliance report on the observance of 'Fuel saving campaign on BS-II vehicles' conducted in their Regions, by 10<sup>th</sup> November, 2009.

**Sd. V.DINESH REDDY  
VICE CHAIRMAN & MANAGING DIRECTOR**

//ATTESTED BY//



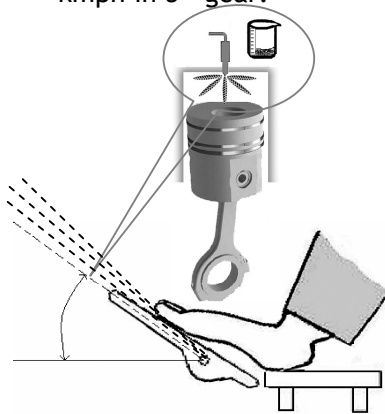
**EXECUTIVE DIRECTOR (E&IT)**

**To  
All Regional Managers**

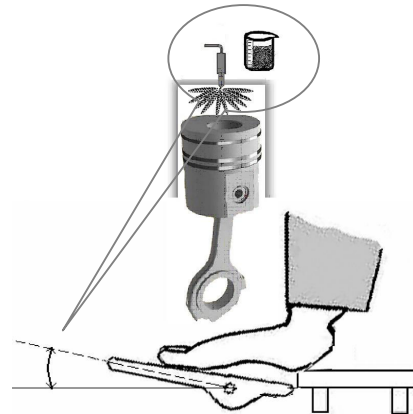
- Copy to: Director (Vig. & security), ED(T&C) & Secretary to Corporation, ED(O&MIS), ED (A&P), FA & CAO for information
- Copy to: All EDs of Zones, GHZ&AM, H&K, V&V and K&N for necessary action.
- Copy to: CME(O), CME(C&B), CE (IT), CPM, CM(R&T), CTM, CCOS, CFM & CA for information
- Copy to: Dy CME(O), Dy.CME(P), Dy.CME(C&B), Dy.CME(IEU), , COS(C-I), COS(C-II) & CSTO for information.
- Copy to: Dy.CMEs for necessary action
- Copy to: All DVMs of HYD and SCD Regions for necessary action
- Copy to: All WMs, COSs, Dy.CAOs of all Zones & necessary action
- Copy to: All Principals of ZSTC and TA/HPT for information
- Copy to: All AMEs(T) for necessary action
- Copy to: All AOs of Regions for necessary action
- Copy to: All Depot Managers for necessary action.
- Copy to: Manual Section/Head Office for filing.
- Copy to: All Maintenance Incharges for necessary action.

## SOME OF THE FUEL SAVING TIPS ON BS-II VEHICLES

- \* The vehicle can not jump from 40 kmph speed to 60 kmph all at sudden even if the accelerator pedal pressed to flat. It takes enough time for the wheels to attain the desired speed from the existing speed. But, keeping the pedal pressed in flat condition allows the FIP & injectors to spray more fuel into the cylinders which is mere waste. Therefore, acceleration shall always be given in smallest possible increments in a gradual manner for getting maximum economy of fuel.
- \* The following figure illustrates how the fuel is injected at different positions of the accelerator when the driver desires to increase the speed from 40 kmph to 60 kmph in 5<sup>th</sup> gear.



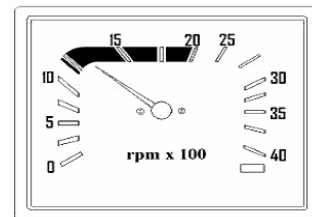
Pedal pressed gradually from 45° to 40°, 35° and so on without injecting much fuel



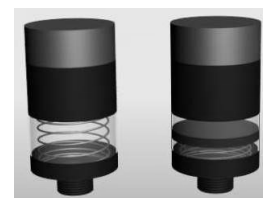
Pedal pressed to flat position at once injecting more fuel into the cylinders

- \* BS-II vehicles have high-torque engines. Even if the vehicle is slowed down in 5<sup>th</sup> gear, it picks up the desired momentum by giving incremental acceleration without shifting to lower gears. Hence, the frequency of gear changes are very minimal in BS-II vehicles whereby more fuel is saved.

- \* Keeping an eye always on the RPM meter is essential to ensure that the engine r.p.m is always maintained in the green band irrespective of the gear selected.



- \* Watch the Service Indicator for appearance of red band. Red band indicates that the Air filters are in choked condition and requires attention. Allowing the vehicle to run in Red band not only leads to ill effects like black smoke, more fuel consumption, poor pick up but also causes damage to the Turbocharger seals.



- \* Restrain from using service brakes unnecessarily. Decelerate the engine instead of applying service brake to slow down the vehicle anticipating the oncoming stops.

Tune the engine, maintain correct inflation of tyres, adjust the brakes & clutch, lubricate all greasing points