Andhra Pradesh State Road Transport Corporation

Mechanical Engineering Department

Office of the VC & MD, Bus Bhavan, Hyderabad – 624.

No : OP4/377(1)/2008-MED

Circular No : 9/2008-MED, dated 06.06.2008

Subject : **BREAKDOWNS** – Technical & Managerial controls to be exercised to reduce the Breakdown rate – Certain instructions issued – Reg.

Ref : 1. Circular No: 12/90-MED, Dt.23.05.1990
2. Circular No: 54/92-MED, Dt. 05.11.1992
3. Circular No: 04/94-MED, Dt. 19.01.1994
4. Circular No: 05/95-MED, Dt. 15.03.1995
5. Circular No: 16/96-MED, Dt. 07.06.1996
6. Circular No: 19/96-MED, Dt. 22.06.1996
7. Circular No: 16/2003-MED, Dt. 05.06.2003
8. Circular No: 17/2004-MED, Dt. 02.11.2004
9. Circular No: 09/2005-MED, Dt. 03.09.2005

The maintenance policies of our corporation are so designed that no vehicle is stranded enroute due to mechanical breakdown of any kind. The objective of the Corporation envisages preventive maintenance to the vehicles in order to provide safe, punctual, reliable and efficient operations to the public. Hence, foreseeing the possible breakdowns and arresting them by rendering the required maintenance as per the stipulated maintenance schedules is the basic principle of our entire maintenance activity. Thus, the ultimate aim of our maintenance management is to provide "***Break down free***" service.

When we are aiming at "***Zero Breakdown***", the BD Rate of 0.12 per 10,000 kms at Corporate level for the year 2007-08 is a matter of concern. Every breakdown has serious impact on the credibility of our services besides loss of revenues and unforeseen expenses.

During the recent meeting of all EDs/RMs/HODs, a lengthy discussion was made on this subject and it was made amply clear that field Managers have a greater responsibility in reduction of breakdowns by exercising proper technical and managerial controls. Several guidelines have already been issued through MED circulars on control of breakdowns.

With a view to identify the common factors and causes for breakdowns, a big exercise has been done at Corporate Office by classifying the total Breakdowns occurred during 2007-08 into various categories in each system/ sub-system of the vehicle. On making critical analysis of these breakdowns, it is observed that majority of the breakdowns would have been totally avoided had the preventive maintenance practices are effectively carried out.

The analysis reveals that in ***Ashok Leyland area (excluding HCR/SCR),*** out of the ***4,865*** breakdowns, about ***52% of the Breakdowns*** have occurred because of the following ***10 reasons***.

	SYSTEM	CAUSE	Nos	%
1	**Tyres**	Tyre Puncture	**595**	12%
2	**PP shafts**	PP Shaft Broken	**507**	10%
3	**Engine**	Engine Sound	**383**	8%
4	**Fuel**	Air Lock	**383**	8%
5	**PP shafts**	UJ Cross Failure	**192**	4%
6	**Fuel**	Fuel Pipe Lines Leak	**121**	2%
7	**Gears**	Gears Struckup	**121**	2%
8	**Electrical**	Alternator Sound	**101**	2%
9	**Brakes**	Brake Jam	**99**	2%
10	**Electrical**	Self Starter Failure	**97**	2%
		Sub Total	**2599**	**52%**
		Total failures	**4865**	

Similarly, in ***Tata area 42% of the total 11,367*** Breakdowns have occurred due to the following ***10 reasons***.

	System	CAUSE	Nos	%
1	**Fuel**	Air lock	**833**	7%
2	**Tyres**	Tyre Punture	**737**	6%
3	**Clutch**	Clutch slip	**459**	4%
4	**Gears**	Gears struck up	**443**	4%
5	**Clutch**	Clutch pressure plate defective	**442**	4%
6	**PP shafts**	CJ Iron bracket broken	**426**	4%
7	**Engine**	Cylinder Head Gasket Failure	**409**	4%
8	**Engine**	Engine Sound	**391**	3%
9	**Fuel**	FIP Failure	**306**	3%
10	**PP shafts**	CJ Rubber Bed failure	**305**	3%
		Sub Total	**4751**	**42%**
		Total failures	**11367**	

In **HCR & SCR regions, out of 5,664** failures, only the following 10 items are contributing to 75% of the total breakdowns.

	System	Cause	Nos	%
1	**Tyres**	Tyre Puncture	**1996**	35%
2	**PP Shafts**	PP Shaft Broken	**659**	12%
3	**Gears**	Gears Struckup	**323**	6%
4	**Electrical**	Self Starter Failure	**292**	5%
5	**Fuel**	Air Lock	**269**	5%
6	**Gears**	Gear Lever Broken	**211**	4%
7	**Brakes**	Brake Jam	**165**	3%
8	**Clutch**	Clutch Slip	**137**	2%
9	**Brakes**	Air Pipes Leak	**113**	2%
10	**Engine**	Engine Sound	**94**	2%
		Sub total	**4259**	**75%**
		Total failures	**5664**	

It could be understand that there is ample scope for reduction of Breakdowns merely by concentrating on the few items, which constitute the major share of total breakdowns. Apart from ensuring the quality of preventive maintenance through checks & crosschecks, there is a need to exercise proper managerial controls on reduction of breakdowns. The following steps need to be taken by the Depot Manager/ Maintenance incharge to reduce the breakdowns.

I. **TECHNICAL CONTROLS** :

The existing preventive maintenance checks at various periodicities for different models of vehicles which were communicated through the circulars and manuals from time to time have to be followed in toto for avoiding breakdowns. In most of the cases non-adherence to the periodical checks and timely attention are resulting in failure of vehicles. Therefore it is felt that there is no need to reiterate the guidelines on technical aspects of the vehicle maintenance at this juncture. However, it is strictly advised to follow the guidelines without any deviation to avoid breakdowns.

II. **MANAGERIAL CONTROLS** :

a) Analysis & Review : ***Proper analysis/review*** plays major role in taking corrective action for prevention of breakdowns. Instructions are in vogue on how to classify the breakdowns into various systems and identify the areas in which the occurrence of breakdowns is more prevalent for the purpose of taking corrective measures. However, the existing system of breakdown analysis depicts only a broad picture which does not provide the required inputs for having micro level analysis. In order to make the analysis more purposeful, there is a need to revise the classification of breakdowns. Besides recording the day-wise breakdowns in the Breakdown Register (RTC-127), the summary of breakdowns shall be recorded at the end of the month in the proforma shown at ***annexure-I*** which consists of system/sub-system wise analysis (micro analysis) of all failures.

This shall be implemented with immediate effect at all depots and communicated to the Regional Offices on monthly basis as a periodical for review.

Mere classification of breakdowns does not yield any result unless it is ***properly reviewed*** by the DM and Maintenance incharge with a view to identify the lacunas in maintenance.

Each breakdown ***shall be analyzed in a diagnostic manner*** to identify the root cause for failure. None other than the three reasons i.e, ***Human negligence***, ***material fault***, ***process/system deficiencies are behind any breakdown***. A careful analysis is therefore required to identify the actual cause of failure to take a corrective action.

The Dy.CME/RM during their visit to the Depots and during review meetings shall make a thorough review based on the micro analysis of breakdowns and guide the DM/Maintenance incharge on the areas which require greater attention.

b) Provision of required spares and aggregates : Ensuring the availability of required Spares and aggregates is one of the prerequisites from the managerial point of view in order to render flawless preventive maintenance to the vehicles. There shall ***not be any compromise with replacement of defective spares/ units*** on the vehicles which otherwise would fail enroute resulting in vehicle breakdown. Thus, ***a precise planning of spares, sub assemblies and units well in advance is very much required to avoid breakdowns***. Proper assessment shall be made based on the review of the life rendered by the units and critical spares of the individual vehicles. ***Failure to replace the spares/ units in time will not only result in vehicle breakdown but also leads to irreparable damage to the major aggregates***. Hence, stocking of essential spares and aggregates at all times in the depot assumes highest importance.

It is the primary responsibility of the Depot Manager to ensure the availability of the materials at the depot with the assistance of Maintenance incharge & Stores Supervisor. The ***Dy.CMEs of the regions shall co-ordinate with the Zonal Stores & Workshops and provide necessary support to the Depots*** in getting uninterrupted supplies for breakdown free maintenance.

While reviewing the breakdowns, the Dy.CMEs shall make a special note of the ***supply deficiencies of materials that are contributing to the breakdowns and take corrective action duly discussing the same in LFC & PRC meetings***.

c) Quality of materials : ***Quality of the spares*** & ***quality of overhauls*** also play major role in the vehicle breakdowns. The Maintenance incharge of the depot shall immediately bring to the notice of the Dy.CME concerned about the quality deficiencies that have contributed to the breakdown of vehicles so that a timely action is taken at Zonal level/ Corporate level to stop procurement of defective products or take corrective measures during unit overhaul at Workshops.

d) Maintenance & review of Vehicle Back History Register : The Depot Manager/Mechanical Foreman shall review the Vehicle Back History register regularly and ***ensure that all the columns of the register are posted upto date***. Vehicle Back History Register ***helps in a great way in reduction of breakdowns by indicating the chronic defects*** with which the vehicles are running. There can be very few breakdowns which occur abruptly and majority of the breakdowns give an indication much before their occurrence. The symptoms of the possible breakdown can be easily known by reviewing the logsheet complaints recorded in the Vehicle Back History register. The Shift Incharges shall inspect the vehicle thoroughly and take necessary action to rectify the chronic RGs. The incharge of Sch.III/IV maintenance shall pay special attention to the chronic RGs of the vehicle at the time of carrying out Sch.III/IV maintenance and clearly mention the corrective action taken in the Vehicle Back History register. The vehicle shall be totally free from such defects once the vehicle is undergone sch-III/IV maintenance.

e) Creating awareness among the staff : It is the responsibility of the Maintenance incharge to ***propagate the message of the each and every breakdown to all Supervisors and maintenance staff*** so that everyone is aware of the incidence. A ***big display of day-wise breakdowns shall be arranged*** at a conspicuous place in the garage for the information of Drivers and Maintenance staff. The typical layout of the display board is shown at ***annexure-II***.

Everyday, the shift incharge/Sch.III/IV incharge while taking the attendance of the staff shall ***explain and discuss about the breakdowns occurred during the previous day*** and avert recurrence of such failures by taking corrective actions on the other vehicles either ***during Sch.I/II or during SchIII/IV*** maintenance.

f) Counselling & Disciplinary action on human negligence : The DM shall initiate suitable disciplinary action on the staff responsible for the breakdowns due to their negligence despite giving ample opportunity for improvement through counseling.

g) Training and Improvement of skill levels : Failure of vehicles due to the ignorance of the maintenance staff shall never be allowed to take place. It is the prime responsibility of the Dy.CMEs to identify the areas of maintenance which require sufficient training and upgradation of skills from time to time by organizing special training programmes either through inhouse training facilities or by involving the OEMs. The specific requirement of training in the Region can be brought to the notice of head office by the Dy.CME's for organizing the training programmes with the help of OEM's.

The RMs, Dy.CMEs, Depot Managers and Maintenance incharges are advised to implement the above instructions with true spirit and strive for achieving "***Zero Breakdown***".

VICE CHAIRMAN & MANAGING DIRECTOR

To
All Depot Managers.

Copy to : Dir (V&S), FA, CAO, ED(O), ED(A&P), ED(T&S) and all EDs(Zones) for infm.
Copy to : All RMs for necessary action.
Copy to : CME(C&B), CCOS, CTM(O), CMM, CM(HRD), CPM & CE(IT) for information
Copy to : All Dy.CMEs for necessary action
Copy to : All WMs, COS' for necessary action.
Copy to : All Principals ZSTCs & TA/HPT for information
Copy to : All Maintenance incharges for necessary action
Copy to : Manual section.

Annexure-II

నేటి బ్రేక్ డౌన్ వివరాలు

తేదీ: 22-05-2008		
1.	బస్సు నెంబరు	--- AP11Z 4545 (ORDINARY)
	సర్వీసు	--- రాయదుర్గం - అనంతపూర్
	ఫెయిలైన ప్రదేశం	--- కళ్యాణదుర్గం
	సమయం	--- 19-45
	ఫెయిల్యూర్	--- డీజలు లీక్
	కారణం	--- సరైన క్లాంపు లేని కారణంగా ఓవర్ ఫ్లో పైపు చాసి కి తగులుకొని పైపుకు రంధ్రము ఏర్పడడము
	షె-I వివరాలు	--- శ్రీ ఏకాంబరం, 411411 21-05-08 - ఏ-షిఫ్ట్
	షె-II వివరాలు	--- శ్రీ పుల్లిరాజు, 421421 18-05-08
	షె-III/IV వివరాలు	--- శ్రీ ఏడుకొండలు, 454454 09-05-08
	నష్టపోయిన కి.మీ/ ఆదాయం	--- 90 కి.మీ - 1200 రు
	ఇదే కారణంతో గతంలో జరిగిన ఫెయిల్యూర్ లు	--- 12-03-08 నాడు మరియు 10-04-08 నాడు

2.	బస్సు నెంబరు	--- AP11Z 5454 (EXPRESS)
	సర్వీసు	--- రాయదుర్గం - కడప
	ఫెయిలైన ప్రదేశం	--- ముద్దనూరు
	సమయం	--- 20-45
	ఫెయిల్యూర్	--- ఎయిర్ నిండకపోవడం
	కారణం	--- సక్షన్ వాల్వులో దుమ్ము చేరుకొని ఏ.సి.హెడ్ పనిచేయకపోవడము (ఏ.సి.సక్షన్ హోస్ మిస్సింగ్)
	షె-I వివరాలు	--- శ్రీ రాయుడు, 450450 21-05-08 - బి-షిఫ్ట్
	షె-II వివరాలు	--- శ్రీ అర్జిరాజు, 430430 19-05-08
	షె-III/IV వివరాలు	--- శ్రీ బాష, 420420 12-05-08
	నష్టపోయిన కి.మీ/ ఆదాయం	--- 150 కి.మీ - 2000 రు
	ఇదే కారణంతో గతంలో జరిగిన ఫెయిల్యూర్ లు	--- ఏమి లేవు

Annexure-I

SUMMARY OF BREAKDOWNS FOR THE MONTH OF _____

Code	System/ Sub system	For The month	Upto The month
ENGINE			
EN1.	Cylinder Head Gasket		
EN2.	Engine sound		
EN3.	Others		
	Total		
FUEL			
FU1.	Air Lock		
FU2.	Fuel Leakage		
FU3.	FIP/Feed pump		
FU4.	Others		
	Total		
COOLING			
CL1.	Water Pump		
CL2.	Fan belts		
CL3.	Radiator Boiling		
CL4.	Others		
	Total		
CLUTCH			
TC1.	Clutch slip		
TC2.	Withdrawal mechanism		
TC3.	Hydraulic system		
TC4.	Pressure plate defective		
TC5.	Others		
	Total		
GEAR BOX			
TG1.	Gear Struck up		
TG2.	Gear lever/ linkages		
TG3.	Gear Slip		
TG4.	Others		
	Total		
PROPELLER SHAFTS			
TP1.	Shafts & Yokes breakage		
TP2.	Center Bearings & UJ Crosses		
TP3.	Mounting brackets & Rubber beds		
TP4.	Others		
	Total		
REAR AXLE			
TR1.	Differential & internal components		
TR2.	Axle shafts		
TR3.	Hubs		
TR4.	Others		
	Total		

Code	System/ Sub system	For The month	Upto The month
STEERING			
ST1.	Steering Box		
ST2.	Vane Pump		
ST3.	ATF Oil Pipes		
ST4.	Steering linkages & Ball joints		
ST5.	Others		
	Total		
SUSPENSION			
SP1.	Spring Leaf breakages		
SP2.	Brackets, Shackles, Pins & bolts		
SP3.	Air Bellows		
SP4.	Others		
	Total		
BRAKES			
BR1.	Air Pipes leakage		
BR2.	AC Head		
BR3.	Brake Units (Valves & Brake chambers)		
BR4.	Foundation brakes (Drums, liners etc)		
BR5.	Others		
	Total		
ELECTRICAL			
EL1.	Lighting (H/L, R/L etc)		
EL2.	Wiring		
EL3.	Units (Alternator, Self Starter)		
EL4.	Batteries		
EL5.	Others		
	Total		
TYRES			
TY1.	Puncture		
TY2.	Burst		
TY3.	Runflat		
TY4.	Others		
	Total		
MISCELLANEOUS			
OT1.	Body & Glasses		
OT2.	Struck-up		
OT3.	Others		
	Total		

Description	For the month	Upto the month
Total No. of Breakdowns		
Operated Kms		
B.D.Rate Per 10,000 kms		
No.of Failures within 15 days after Sch.III/IV maintenance		

Suggestions/ Recommendations of the Inspecting Official :