

# L&T Earthmover News

Wish You A  
Happy & Prosperous  
New Year 2006

Vol. 17, No. 3

July-December 2005

## L&T Inaugurates State-of-the-art Service Station in Nagpur

**L**&T inaugurated its new Service Station for Construction and Earthmoving equipment in Nagpur. Mr. J.P. Nayak, President (Operations) and Member of the Board, L&T, inaugurated the Service Station at Logistics Park, Nimji, on National Highway-6 on the Nagpur-Amravati Road.

The Service Station will enable L&T to provide superior product support to a wide range of equipment including hydraulic excavators manufactured by L&T-Komatsu Limited, imported equipment from Komatsu such as hydraulic excavators, wheel loaders, dozers, dump trucks and motor graders; backhoe loaders and vibratory compactors from L&T-CASE; hydraulic equipment used in sugar-mill drives, material handling, mining and other applications; as well as surface-miners, mobile



Mr. J.P. Nayak unveiling the inaugural stone



Customers going around the new Service Station

crushers, road millers-cum-soil stabilisers manufactured at L&T Kansbahal Works, Orissa.

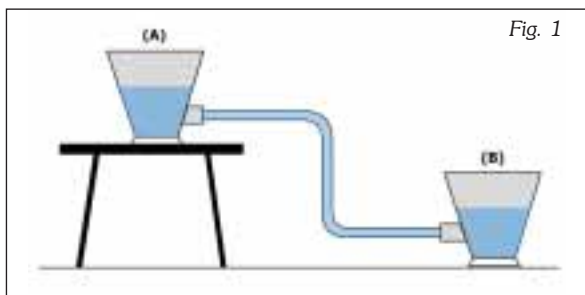
The Nagpur Service Station has a total area of 4,750 square metres with a workshop built-up area of 1,033 square metres. Facilities include state-of-the-art hydraulic test bench, engine repair centre, overhaul facilities and transmission repair capabilities. These facilities will ensure support, rehabilitation, condition based monitoring of machine and components, up-time of machines with major customers in the nearby coal, cement, iron ore mining belt.

For L&T, which set up its first Service Station at Powai in the early 1940s when construction and mining equipment were scarce in India, this is the fifth Service Station. The other Service Stations are strategically located in Chennai in the South, Delhi in the North, Durgapur in the East, and Pune in the West.

In the previous issue of this magazine we had discussed about batteries, the care and maintenance it requires to derive the best out of it. In this issue, we shall deal with the basic laws of electricity, and how they are employed on earthmoving machines.

It is easy to understand the behaviour of Electricity, which is similar to water. Like water that flows from higher level to lower level, electricity also flows from a point of higher potential (voltage) to a point at a lower potential.

In the fig. 1, bucket (A) is at a higher level, than (B), so water will flow from (A) to (B) through the water pipe due to the difference in the level.



In a battery, the voltage difference between the +ve and -ve terminal is 12 Volts. If they are connected with the help of a conductor, current will flow from the +ve terminal to the -ve terminal. Like a pipe required for carrying water from one place to another, a conductor is required to carry electric current from one point to another. The inner diameter of the water hose and the difference in water level determines the quantity of water that flows from bucket 'A' to Bucket 'B'. Similarly the amount of current that flows from the batteries' +ve to -ve terminal depends upon the potential difference, and the current carrying capacity of the joining conductor plus any other obstruction or resistance that comes in the way of current flow. Hence, we see that there are two parameters that play a role in determining the current flow in a circuit; 'Voltage and the resistance'. Resistance is the property of a material by which it opposes the flow of current through it. Ohm ( $\Omega$ ) is the practical unit of resistance. 1 Ohm is the resistance of a conductor when a potential difference of 1 volt produces a current of one ampere through the conductor.

Ohm's Law describes the relationship between current, voltage and resistance in a circuit. It states that the current carried in a conductor is directly proportional to the potential difference across its ends, provided the

temperature of the resistance does not change. Hence, if  $V =$  voltage,  $I =$  current and  $R =$  resistance, then as per Ohm's law  $V = I \times R$ . With this simple equation, we can find out the value of the third component, if the other two are known. In a machine or an automobile, all electrical loads like head light bulbs, horn, solenoids, fan, wiper, etc., are different types of resistances.

Resistances in a machine are either connected in series or parallel.

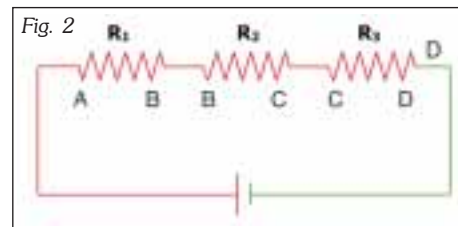
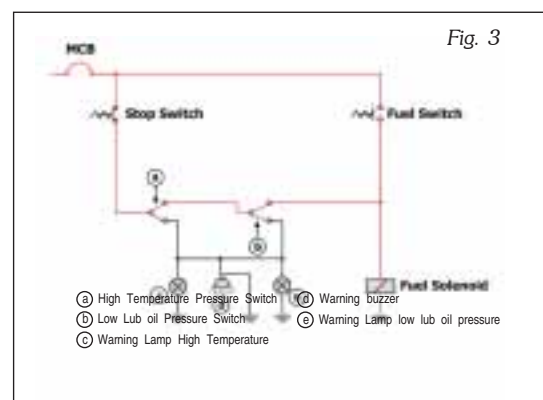


Fig. 2 shows a simple series connection of three resistances  $R_1$ ,  $R_2$  and  $R_3$  across the battery source. When resistances are joined end-to-end, as shown in the figure, they are said to be connected in series. The total resistance between point A and D is equal to the sum of three individual resistances. Being in series, the current ( $I$ ) is the same through all the three conductors, but the voltage across is different due to its resistance and is given by Ohm's Law. The sum of the three voltage drop is equal to the source voltage applied across. There is a progressive fall in potential as we go from point A to point D. Miniature decoration lamp chain is the most common example of series connection. It has an advantage that a very small current flows in the circuit and all the bulbs can glow together. However, it has a disadvantage, that if any one bulb gets fused, the entire chain goes off. For this reason, series circuit seldom finds application on machines.

Fig. 3 shows series connection of gadgets on 300CK(D).



On a machine, the stop switch and safety devices are connected in series. The figure shows the starting circuit of 300CK, which is equipped with the electrical stop switch and protective devices like high water temperature trip and low oil pressure trip. The fuel solenoid on the PT pump (Fuel pump of the engine) has to be energized to allow fuel to the PT pump. Hence, as long as the fuel solenoid is energised, the engine runs. Therefore, for the engine to start, supply to the fuel solenoid is given from the battery through the normally closed stop switch, high water temperature switch and low oil pressure switch, all connected in series. In case the water temperature exceeds safe value, the contact changes; and supply to the fuel solenoid is cut off, which trips (stops) the engine. Similarly, supply to the fuel solenoid is cut-off and engine stops even if the stop switch is pressed or the low oil pressure safety switch changes contacts.

Fig. 4 shows three resistances connected in parallel across a source. In this case, the voltage applied across each resistance is the same. The current in each resistor is different and is given by Ohm's Law. The total current drawn from the source is the sum of the currents in the three branches. This has the advantage that each circuit is independent of the other. When controlled by separate switches, they can be operated independently, like the way we operate electrical gadgets at home or office. Basically, all electrical connections in automobiles and earthmoving machines, are connected in parallel.

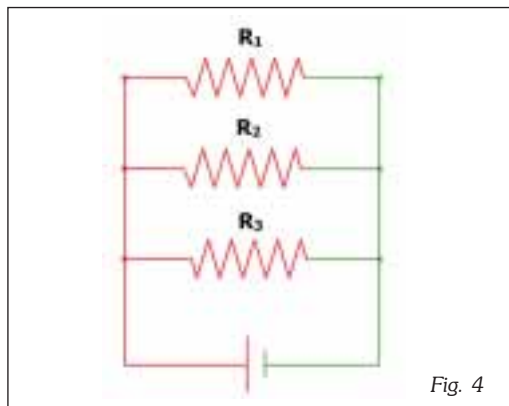


Fig. 4

In fig. 4, if one has to replace all the three resistances by an equivalent resistance, so that the load on the source or battery remains unchanged, then the equivalent resistance 'Req' can be found out by a simple relationship.  $1/Req = 1/R1 + 1/R2 + 1/R3$ . With this equation, the value of equivalent resistance is always smaller than the smallest resistance. Hence,  $E/Req$  gives

the total current drawn from the source ( $E$ =Battery Voltage).

The power consumed by the electrical loads is derived by the equation  $P$  (Watts) =  $V$  (Volts) X  $I$  (A) where  $V$  is the source voltage and  $I$  is the total current. With this equation, the current drawn by a component can be found out, if the power and the operating voltage are known. A 24V 50 Watt bulb will require  $50/24 = 2.08A$ , while a 24V 100W bulb will draw  $100/24 = 4.16A$ .

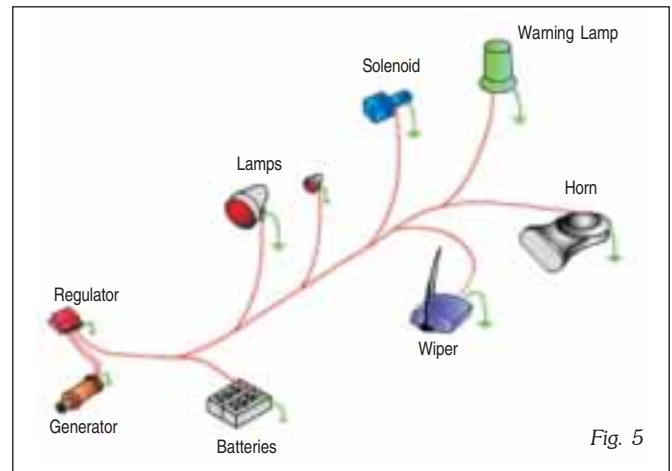


Fig. 5

Fig. 5 gives a typical wiring schematic in any earthmoving machine. You will notice that all the loads (bulbs, horn, wiper, solenoids, fan etc.) are connected in parallel, which is the power supplied by the battery when the engine is stationary, and by the alternator when the engine is running. Each component can be switched on whenever desired and the current is supplied from the source. Additional loads can very easily be connected by just adding another branch to the main circuit. This often tempts us to add electrical loads to suit our convenience, and we tend to ignore its effects on the source or the remaining parts of the circuit.

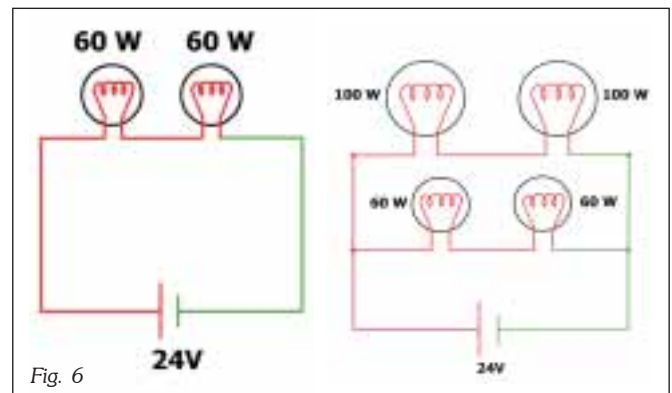


Fig. 6

Let us assume that a machine is fitted with 2 headlight bulbs of 24V- 60 W each as shown in fig. 6. The current

## L&T – India's Superbrand

drawn by each bulb is equal to  $60/24 = 2.5$  A. So, the total current required in the circuit for two bulbs equals to 5A, which is normally provided in a medium size earthmoving machine. If the illumination requirements are higher, additional bulbs can be mounted to increase the illumination. Let us assume that only 2 additional bulbs of 24V-100W each are added in parallel. The current drawn by these additional loads will be  $100/24 = 4.2A \times 2$ . Thus, an additional load of 8.4 A will be handled by the alternator. It is seen that while the original circuit wiring was carrying only 5 amperes, now it has to carry 13 amperes (8.4A + 5A). The current in the circuit has become more than twice due to the additional bulbs alone. This additional current increases the burden on the alternator and can lead to early failure of the regulator in the alternator. The wirings in the circuit also have to carry a much higher current, which can lead to higher temperatures in the conductors, and result in blowing of the fuses and weakening of insulation in the wires. Modern day machines have electrical components like solenoids and controllers that require continuous supply of current to keep the various features in operation. Hence, one should be very cautious while adding high wattage loads in the circuit. If load addition becomes imperative, then a higher capacity alternator should be considered.

To sum up, the few key points covered are:

- When load is connected in series, the same current flows through the circuit and all functions operate together.
- All safety items and stop switches are connected in series.
- When load is connected in parallel, they work independent of other.
- The total current drawn is equal to the sum of the current used by individual load.
- Addition of high wattage load in parallel will drastically increase the current in the circuit.
- High current in the circuit will lead to early insulation and even alternator failure.
- When load addition becomes imperative, care should be taken for proper safety of the system.

*In the next issue we shall touch upon similar topics that will help you extract the maximum out of your construction and mining machines.*

L&T officially acquired the status and aura of a Business Superbrand. At a 'Tributes Function' in Mumbai, Mr. J. P. Nayak, President (Machinery & Industrial Products) and Member of the Board, was presented a trophy by 'Superbrands India' – the Indian affiliate of a global body devoted to promote the discipline of branding. L&T is now part of an elite group of companies that have been acknowledged as brands that continuously and consistently keep pace with customer expectations. The award culminates a rigorous selection process by an eminent brand council which studied 854 brands in 82 product categories.

L&T now features in a prestige volume – the "Superbrands Book" released



*Mr. J.P. Nayak (left) receives the Superbrands trophy from Mr. Praful Patel, Union Minister for Civil Aviation*

on September 8, 2005. Two richly illustrated pages in this volume trace L&T's unique history, and highlight its achievements and core brand values. L&T also has the right to feature the 'Superbrands' logo in all forms of communication.

## 2000<sup>th</sup> L&T-Komatsu PC200-6 Hydraulic Excavator delivered

Larsen & Toubro Limited (L&T), which offers a wide range of construction, earth-moving, road building and mining equipment, achieved yet another milestone when its Construction and Mining Equipment Business Unit delivered the 2000th L & T - K o m a t s u Hydraulic Excavator Model PC200-6 at Bangalore on 22nd September 2005. Mr. J.P. Nayak, President (Operations) and Member of the Board, L&T, formally handed over the keys of the 2000th machine to Mr. V. Raja



*Mr. J.P. Nayak greeting Mr. V. Raja Rama Mohan Rao, Chairman, SEW Constructions Ltd.*

Rama Mohan Rao, Chairman, SEW Constructions Limited who are one of the fleet owners of machines supplied by L&T. Model L&T-Komatsu PC200-6 was introduced in the Indian market in January 1999, consequent to the formation of the joint venture L&T-Komatsu Limited between Larsen & Toubro Limited and Komatsu Asia & Pacific Pte Limited. L&T markets and provides after sales support for the products manufactured by L&T-Komatsu and other Komatsu plants worldwide.

products manufactured by L&T-Komatsu and other Komatsu plants worldwide.

## Hon. Chief Minister's visit to GNSS Project, Jamalmadugu (KADAPA District)

Hon. Chief Minister of Andhra Pradesh, Dr. Y. S. Rajashekar Reddy visited the GNSS FLOOD FLOW canal project, at Jamalmadugu on 14th Sept. 2005. He was welcomed by Mr. V. Prabhakar Reddy, who is a valued customer of Larsen & Toubro Limited.

The District Officials, Chief Engineer (Irrigation) and L&T personnel from Hyderabad, greeted the Chief



*Mr. V. Prabhakar Reddy welcoming Hon'ble Chief Minister Dr. Y.S. Rajashekar Reddy*

Minister and took him around the canal site. The Chief Minister was shown the large fleet of machines viz., 10 nos. PC300s and 2nos. PC600s, which were working for the canal project.

Later, the Chief Minister was briefed on the pioneering venture of Mr. V. Prabhakar Reddy in deploying Komatsu PC600LCSE-7 Hydraulic Excavator in Irrigation Projects.

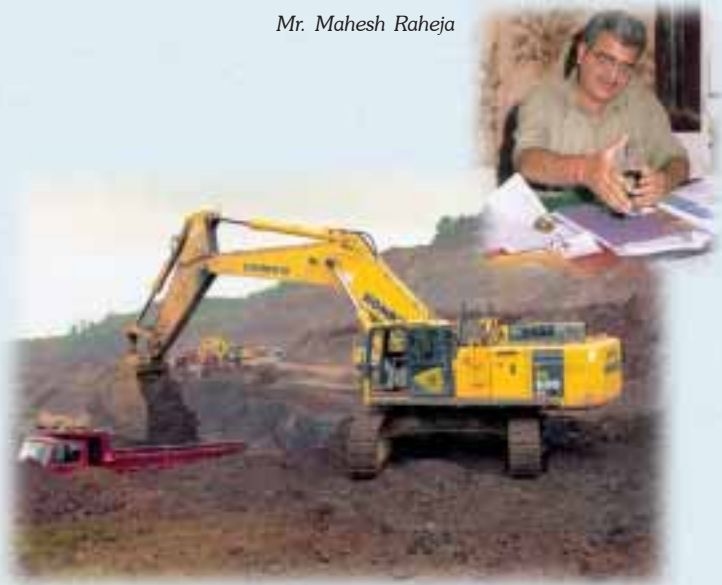


*Komatsu PC600 LC working at the Canal Site*

## DEMPO Mining Corporation

Dempo – is a well known name in Goa and the popular name all over the globe for their multifaceted industrial activity. Dempo Mining Corporation is a wholly owned subsidiary of V.S. Dempo & Co. Ltd. and contributes over 75% of the Group's production of ore. They have 19 mining concessions all over Goa, admeasuring about 1800 hectares. Mining being the core business, mining machines of all makes are operating in the mines. Having switched over to KOMATSU machines, Mr. Mahesh Raheja, Head-Bicholim mine opines, "In Komatsu machine swing cycle is better compared to the similar size of the machine of other models" and continues, "Our method of calculating the productivity is different. We also consider fuel consumed per ton of loading, ergonomics of the machine, consistency in performance and the operational fatigue in selection of Heavy Earthmoving Machines."

Mr. Mahesh Raheja



## FOMENTO

Sociedade de Fomento Industrial Pvt. Ltd. as formally known, has emerged internationally as a highly reputed mining, ore beneficiation and allied technology development company poised to export over two million tons per year of super grade iron ore and concentrates. Fomento presently operates five iron ore mines in Goa and two mines in Karnataka. It has branched out into an array of pioneering mining related activities. Mine exploration & production, mineral dressing, land & river transportation, land-out systems, shipping and stevedoring.

Photographs show the handing over ceremony of Komatsu Dozers to M/s. Ferro Met Concentrates, a 100% EOU Company and a division of Sociedade de Fomento Industrial Pvt. Ltd. M/s. Ferro Met Concentrates added the fleet of all air conditioned Komatsu D275A-5 ripper dozers and introduced D65E-12 for the first time in India for the application of dump dozing.

**KOMATSU  
REDIFINING  
BENCHMARK**



Mr. Auduth Timblo, Chairman & Managing Director of Fomento Group of Companies cutting the ribbon to mark the commissioning of Dozers



Mr. S.K.Mitra, General Manager, Construction & Mining Equipment Business Unit, L&T, handing over a plaque to Mr. Auduth Timblo of Fomento Group of Companies

## V.M. Salgaocar & Bro.Pvt. Ltd.

In the fleet of mining machines with Salgaocars, L&T supplied equipment occupies a dominant place. Mr.R.Subramanian, General Manager, Mines and Mr. K.B Haldankar, Deputy General Manager, Mines, are of the same opinion.

Mr. Subramanian's association with Salgaocars spans over 27 years and his relationship with L&T ever since. Having been familiar with L&T 300 class of machines and now switched over to Komatsu brands, they feel that the machine reliability supplemented with service backup are the important factors.

Mr. Subramanian who has hands-on experience in operating L&T 300 quotes, "K o m a t s u machines are the best

suited for iron ore applications. If I have to think of a new machine, the first one that comes to my mind is Komatsu make."

Mr. K.B. Haldankar, Deputy General Manager, Mines, is of the opinion that fuel efficiency plays an important role in the day to day working and feels that Komatsu is also scoring high on speed with latest technology and operator comfort. Mr. Haldankar is of the opinion that the operator comfort like air-conditioned cabin plays an important part in the productivity. 'In the mining environment, operator prefers to remain inside the air conditioned cabin', he says.

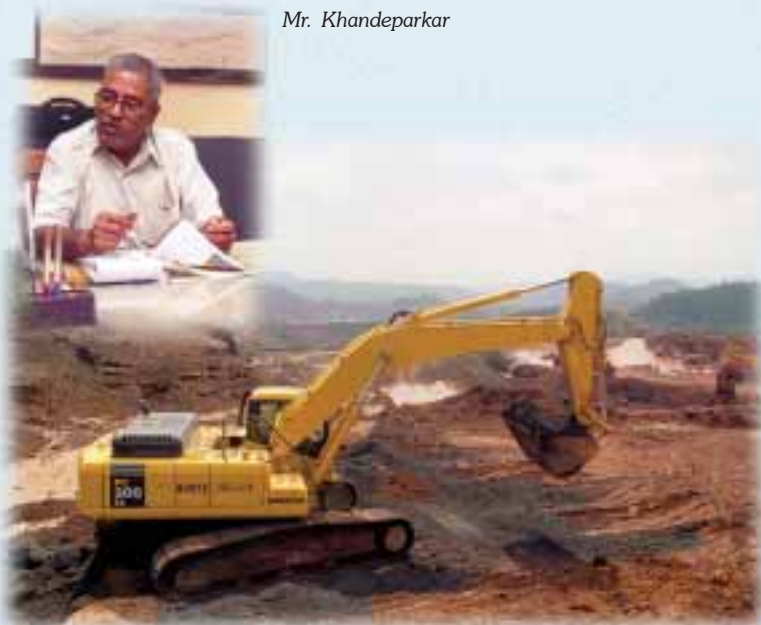


Mr. R. Subramanian

Mr. K.B. Haldankar

**MACHINES  
PRODUCTION  
WORK IN GOA**

Mr. Khandeparkar



## Chowgule & Company Limited

Chowgules, another leading industrial house in Goa, with multifaceted activities, are engaged in iron ore mining as their core business. Amongst a large fleet of machines of all makes, Komatsu PC300 hydraulic excavators occupy a predominant place. They work with a fleet of thirteen KOMATSU PC300 excavators supplemented with Komatsu graders, dozers and L&T 90CK machines.

According to Mr. Khandeparkar, General Manager, 'performance' of the machines is rated high, while fuel efficiency is also a crucial factor.



Mr. Jean Christy Vaiz

Mr. K. Satish

### Virtual Mining Solutions – Sanquelim, Goa

Mr. Jean Christy Vaiz believes in ‘work is worship’. Mr. Vaiz used to see the excavators rolling out from L&T Bangalore Works, during his child-hood and got fascinated by the giant machines. After completing his mechanical engineering, Mr. Vaiz started with Circa Engineering. With hands on experience in SAP and tool making, his urge to excel did not satisfy. Mr. Jean Vaiz moved to Minescape and later started Virtual Mining Solutions along with his partner Mr. Satish K, who is a mining engineer by profession.

Considering L&T’s product reliability, Mr. Vaiz always make it a point to see that only L&T associated machines are operated in his mining activities. Having served some of the organizations, Mr. Vaiz realized that his potential of technical knowledge has not been tapped. Hence, he opted to be an entrepreneur. Though he is in the iron ore-mining contract, he hires the machines to meet his requirement. On owning the machine Mr. Vaiz has got a different version. “I would love to own the machines, but a lot of my friends approach me for hiring business. I have to oblige them. Hence, I go for the hired machines; but with a precondition of providing only L&T supplied machines.”

Mr. Vaiz takes on hire 25 to 30 machines in a year depending on the need. The machines are maintained by Mr. Vaiz as per the contract. With a turnover of around Rs. 10 Crore for the current fiscal, Mr. Vaiz’s ambition is to satisfy 2/3 customers with his personal supervision. He spends most of the days from 5.00 AM to 9.00 PM at site monitoring the progress of his project. Now he is operating at two places - Goa and Tumkur (Karnataka).

### Singbal Associates

Singbal Associates started as a proprietary concern in the year 2000 by Mr. Manguesh Singbal. He is a B.Pharm (1980 batch) and then also completed 3 year course in Mechanical Engineering. Subsequently he wanted to join his uncle’s business, but went abroad on assignments with different companies. However, his inner urge to achieve himself motivated him to return back to India. After the initial stint, he started the mining contract in Goa through his contacts. Initially Mr. Manguesh hired wheel loaders for his requirement, which are operating in the same site for 22 hrs a day.

Based on Mr. Ambar Timblo’s suggestion, Mr. Manguesh purchased the first wheel loader - Komatsu WA380 in the year 2004 for port handling operations. Mr. Manguesh narrates, “The machine is in full operation and the maintenance

is very little. In one and a half year, the machine clocked over 5800 hrs. It is a great achievement.” After watching the performance of the first machine, Mr. Singbal added one more Komatsu wheel loader.

Mr. Singbal devotes most of his time to the business. His wife is a Medical practitioner in Goa. Mr. Singbal’s day starts at 5.30 AM. After regular yoga and morning routine, Mr. Singbal is ready at 8.00 AM for his business and continues upto 6.00 PM. He spends Sundays devoting quality time with his family.

His hobbies are reading and travelling when the time permits. Mr. Manguesh has set a vision for himself i.e., business diversification into iron ore excavation, transportation for different companies. He is also associated with some of the NGO’s to render help to the needy.

Mr. Manguesh Singbal





## Service Camp at Gandhidham

**A**hmedabad team of Construction Equipment Business along with L&T's dealer for construction equipment for Gujarat region M/s. V.B. Techno Enterprises organized a free service camp for the machines operating in Kutch area. During the course of four day camp, PM clinic was conducted on L&T 72, L&T 90-3 and L&T-Komatsu PC 200-6 hydraulic excavators.

The main focus of the programme was on scheduled/timely maintenance, use of genuine parts and also service by the authorized agency to get the increased uptime of the machines. The four-day programme also stressed on the AMC's for machines.



## REMAN Engine

**A**s a step forward in customer service, we are offering 'Reman' Engines to our customers.

To ensure continuity in operation and minimum downtime, we offer our customers an exchange scheme, wherein old/used engine can be exchanged for a 'Reman' or reconditioned engine from L&T's Service Station by paying a differential amount.

When a Reman engine is opted from L&T, the following are the advantages:

- Minimal downtime - only the time taken to exchange your old engine for L&T's Reman Engine.
- Reman Engine is offered with a warranty of 1000 hours.

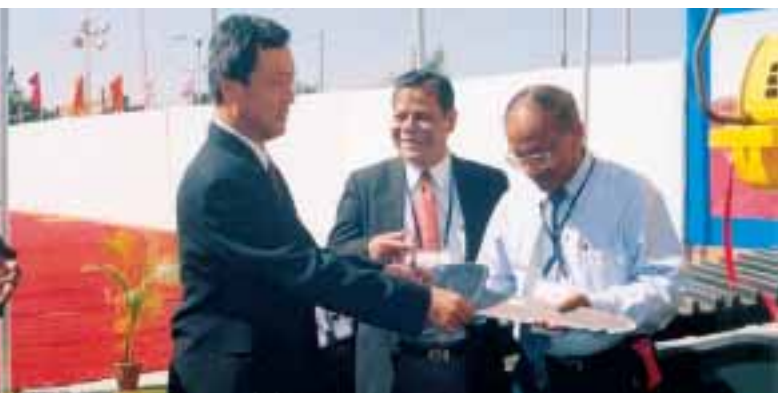


Reman engine displayed at EXCON 2005 exhibition

- Reconditioning of the engine is undertaken by skilled personnel who have thorough knowledge of the original engine and its functions and with proper tools, fixtures and environment.
- Original genuine spare parts are used.
- Installation of the engine on the machine would be done by L&T's technically skilled personnel.

For further details contact Construction & Mining Equipment Business Unit, Product Support Department, Larsen & Toubro Limited, 38, Cubbon Road, Bangalore 560 001.

Email: [naikpr@larsentoubro.com](mailto:naikpr@larsentoubro.com)



Mr. H. Miyazaki, President, Komatsu Asia & Pacific Pte Ltd. handing over the symbolic key to Mr. E.C. Naik, Senior General Manager (Technical), M/s. V.M. Salgaocar & Bro. Pvt. Ltd. Goa



Mr. B. Seenaiiah (fourth from right), MD, M/s. B. Seenaiiah & Co., Mr. N. Nageswara Rao (third from right), CMD, M/s. Madhucon Projects Ltd. and Mr. A.P.S. Chadha (R), Director, M/s C&C Constructions Pvt Ltd. at L&T's stall



Mr. B.V. Raisinghani, Vice-President, Jaiprakash Associates, cutting the ribbon in the presence of Mr. J.P. Nayak, President (Operations) and Member of the Board, L&T. Also seen on the left is Mr. S.K. Warikoo, DGM, Jaiprakash Associates



Mr. J.P. Nayak (L), greeting Mr. Reddy Veeranna, Managing Director, M/s. Reddy Veeranna Constructions



Mr. S. Raghavan, Chief Executive, L&T-Komatsu Limited honouring Mr. Shashank Yadav of M/s. Sapphire Builders. Mr. H. Miyazaki, President, Komatsu Asia & Pacific Pte Ltd. is seen fourth from right

**C**onfederation of Indian Industry organised the 3rd Indian Construction Equipment and Construction Technology Trade Fair from 30th November 2005 to 04th December 2005 at Palace Grounds, Bangalore.

The event had been positioned to showcase the engineering skills of India and its potential as a global outsourcing destination for manufacture of construction equipment and components. The event also emphasised on completion of infrastructure projects with international standards.



Mr. V. Prabhakar Reddy cutting the ribbon in the presence of Mr. H. Miyazaki (second from right)



Mr. S.K. Mitra (R), General Manager, Construction & Mining Equipment Business Unit, L&T, greeting Lt. General K.S. Rao, Director General, Directorate General of Border Roads



Mr. L.D. Agarwalla (third from Right), MD of M/s. BLA Industries in discussion with Mr. S.K. Mitra

Over 170 companies in the construction equipment and construction technology sector participated by displaying their products in 30,000 sq. mtr. net display space. Eleven countries participated in the event.

The glimpse of photographic collage speaks much more...



View of the spare parts and rock breaker displayed



View of the visitors who thronged our stall



Mr. Prakash Nandan (fourth from left), Director – Technical – Operations, Western Coalfields Limited, Nagpur at our stall

## Service Training Centre at Bangalore completes 10 years

**P**roduct Support Department – Service Training Centre at Bangalore completed a decade of operation in July 2005. A function was organised and attended by an august gathering of customers, dealers, senior officials from Komatsu Asia & Pacific Pte Ltd., Bangalore, L&T-Komatsu Limited and L&T. Service Training Centre showcased some of their latest developments like animated circuits for various training kits, PC400 comprehensive training kit, shop manual, e-handbook, intranet website, etc. to mark the occasion.

Mr. J.P. Nayak, President (Operations) & Member of the Board, L&T lit the lamp and emphasised in his inaugural speech on the role of training centre in the emerging market and expressed his satisfaction on the strides made by the Training Centres over the years.

Mr.S.Raghavan, Chief Executive, L&T-Komatsu Limited inaugurated the Training Centre's Intranet site – Gyan Kosh.



Mr. J.P. Nayak lighting the traditional lamp

## Service Camp at Karauli & Sarmathura

**T**he Service Camp at Karauli and Sarmathura in Rajasthan focused on machine inspection at site, training of operators on proper maintenance practice, safe operational practice, advantages and benefits of using recommended lubricants and genuine spare parts.



Service Camp Training in Progress

## Operators' Meet at Pune

**O**perators' meet was held in Pune on 12th September 2005 with the objective of training on right operational techniques. This initiative evoked overwhelming response and appreciation from all the customers in the area. 40 operators of L&T-Komatsu machines attended the programme.

After the classroom session, the participants were taken to the site of Jay Excavators, Satara Road, Pune, where 2 Nos. PC200-6 & 1 No.90CK-3 were working, to observe the correct maintenance procedures and practices.



On the job training for participants