

L&T Earthmover News

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45 Ton Hydraulic Excavator Launched



Mr. J.P. Nayak (L) handing over a plaque to Mr. Sreekumar Lakhotia of M/s. Shree International

L&T's Construction & Mining Equipment Business Unit achieved yet another milestone on February 27, 2008 when the first L&T-Komatsu PC450LC-7 Hydraulic Excavator was launched. At a function held at Bangalore Works, Mr. J. P. Nayak, President (MIPD) and Whole time Director, L&T, honoured the



Mr. S.K. Mittra (4th from left) handing over a symbolic key to Mr. Lakhotia

customer of this first 45 ton machine, Mr. Shreekumar Lakhotia of Shree International, by presenting him a plaque to mark the occasion.

Shree International is one of the east-based frontline companies, which owns and operates a fleet of



The team that participated in the launch event

L&T supplied machines. These machines have been deployed at Durgapur Steel Plant, Alloy Steel Plant, Bhilai Steel Plant and Tata Steel Plant. Apart from these sites, the machines have been deployed for Agra-Dholpur Highway Project and at an overseas project in Algeria. The company is led by its dynamic Director, Mr. Shreekumar Lakhota who is a visionary and has been strengthening business in steel sector.

Present on the occasion of handing over of the first L&T-Komatsu PC450LC-7 were Mr. S. Raghavan, Executive Vice-President, Machinery Sector, L&T; Mr. S. K. Mittra,

Vice-President, Construction and Mining Equipment Business Unit, L&T; Mr. S. Ueno, Managing Director, Komatsu India Pvt Ltd ; Mr. S. R. Subramanian, Chief Executive, L&T-Komatsu Limited; Mr. T. Nakatani, Dy. Chief Executive, L&T-Komatsu Limited and personnel of L&T-Komatsu Limited and L&T.

The launch of this machine marks a new chapter for L&T's Construction & Mining Equipment Business Unit in its continuing commitment to expand the product range and bring proven products from across the world to the Indian Market.

Excavators – Using Machine Features to Advantage

What are the new features in this hydraulic excavator? This is a question invariably asked by anyone who tries to evaluate a machine. The standard reply is, "This machine is loaded with features". The specification sheet generally outlines them and sales engineers explain the benefits during a sales presentation. Machine owners and decision makers evaluate the machine, its features and benefits before the order is placed. But are the features really understood and put to use by the men who use the machine – the operators to be precise? The answer, at times lacks conviction.

Here we make an attempt to explain how features can be best utilized with examples taken from excavators like PC200-6, PC300-7...

Working Modes

PC200-6 is equipped with two working modes namely H & S mode.



The **H mode** is High productivity mode while the **S mode** is the standard mode. Simply speaking H mode is Production Priority mode while S mode is Fuel saving priority mode. H mode uses the full engine HP of the machine (128 HP @2000 rpm) while in S mode it

uses 85% of the available power. As the machine is equipped with pump and engine mutual control system using engine speed sensing the hydraulics automatically sets the pump absorption to use the available power. In S mode the engine speed is reduced by 150 rpm and the pump controller automatically adjusts the absorption torque to a lower value. The visible effect during machine operation would indicate that the speed of operation marginally reduces in S mode during simultaneous operation at higher pressures. Operators, thus have a feeling that the machine becomes slow and do not prefer to operate in S mode. They even have a myth that H mode should be used for hard strata jobs and S mode to be used in soft job conditions. This is however just the opposite. H mode should be used where the job is easy and site efficiency is very good. This is the time to extract very high productivity (cubic meters/hour). **S** mode on the other hand should be used where the job is tough or the site efficiency varies from average to good, so that the productivity is not hampered while fuel economy is achieved. Let us understand this in a little more detail.

Power, by definition is the rate of doing work. A machine that has more power shall do a job faster than a machine that is comparatively less powerful, assuming other factors to be constant.

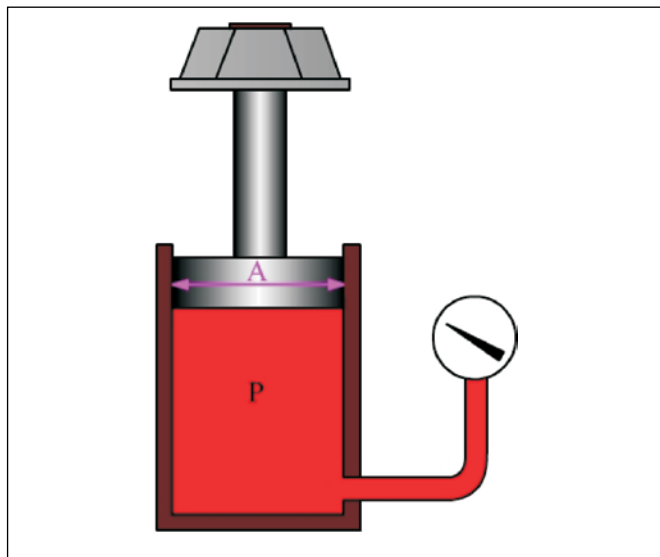
$$\text{Hydraulic Power} = \frac{\text{Pressure (Bars)} \times \text{Flow(l/min)}}{442(\text{a constant})}$$

The hydraulic power used has to be less than or equal to the installed engine power. Hence, in a situation of

high flow and high pressure requirement, the pressure and flow have to be kept constant.

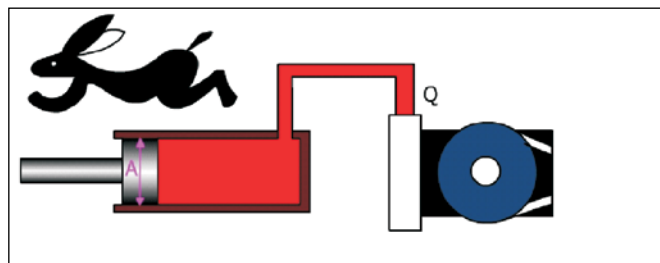
As a user of hydraulic excavator, we need higher forces to excavate or lift loads, and wish to do the job at a high speed.

Now, as we see in the figure below.



Force = (P) Pressure x (A) Cross sectional area of cylinders.

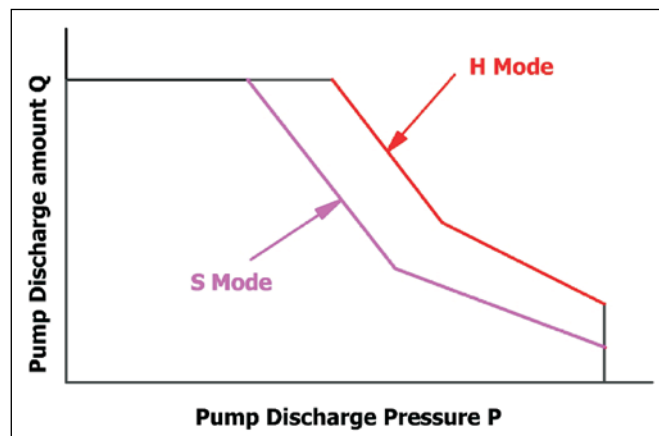
On a machine, however, the cross sectional areas are fixed as cylinder dimensions are fixed by design and user has no control on this. Thus, forces available are directly proportional to pressures. Pressure in the system is load dependent, the maximum pressure being limited by the main pressure regulator, or the safety valves.



Speed of a cylinder = (Q) Flow x (A) Cross Sectional Area.

Here again as the cross section area being fixed, speed of the actuator (machine) is directly proportional to flow. The graph below shows how the flow is varied in H and S modes. We see that the maximum pressures are not altered even if the mode is switched between H & S. Hence, there will be no difference in the digging or lifting ability of the attachment. As only the flow is reduced if the demand goes in the regulation area, the

speed will be marginally affected. Hence, contrary to operator's perception, H&S mode has nothing to do with the digging or lifting ability of the machine.



Then, under what condition should we select these modes? In a layman's language if you are working in granite, marble, limestone or hard rock strata, where the job is difficult, productivity will naturally be not as high. Thus, S mode should be the automatic choice as productivity will be good while fuel economy will be excellent. In case H mode is used for such an application, the attachment speed will be marginally higher, but this will not be reflected in higher productivity, as operators have to handle the job with care. This will not only result in higher fuel consumption as the engine speed is higher, the higher impact load on the structures will add more stress and abuse to the welding of structures. Even if the job is easy, like earthwork, but the number of trucks are not adequate and there is a lot of idle time for want of tippers, then S mode is the best bet. However, during the beginning of shifts when tippers are available and the job is not too difficult then machine should be used in H mode, so that all the tippers are despatched for the first time and when the flow of tippers reduce, operators should switch to S mode.

For easy job requirements like loose earth, sand loading or re-handling applications, where higher machine speed will result in enhanced productivity, H mode should be used. Hence, operators are the best judges to understand the job conditions and use their wisdom to switch between working modes to make the best use of this feature.

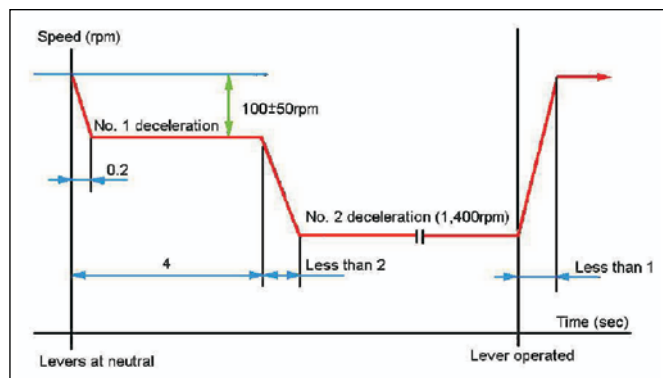
In Machines like PC300-7, PC400-7, PC600-7 the working modes are A (Active) and E (Economy). These modes are akin to H and S modes respectively, and hence, should be used with the same logic.

Auto deceleration

Auto deceleration reduces the engine speed automatically when the engine is running at high idle and no operation is done. This reduces fuel consumption and noise.



The graph below describes the speed change over time in auto deceleration function mode. The operator need



not lower the engine speed while he is waiting for a tipper to arrive or while it is being placed, etc. Engine speed lowers by around 100 rpm no sooner the levers are released and in the 2nd step, the speed lowers to 1400 rpm if no operation continues for four seconds. The engine accelerates to the set working speed in less than a second, no sooner any work equipment lever is operated. The fuel consumed during the waiting time is non productive and any saving here is significant.

Machine push-up

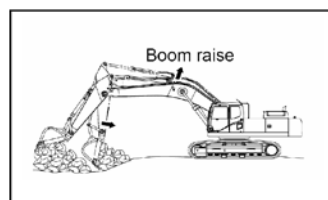
This feature is available on PC300-7 and bigger machines and can be selected by a switch shown in the fig. below:



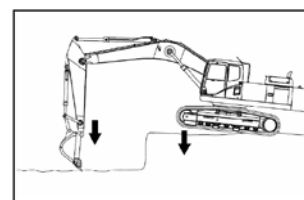
The thicker arrow on the switch indicates Power mode while the thin arrow on the switch indicates the Smooth mode. This improves the stability of the machine during digging in the smooth mode while the power mode can be used for hard digging, or at the time when we intend to lift the tracks. During digging cycle, the natural curve made by the arm movement causes the track chain to lift off the ground. Operators have to control the boom to ensure that track chain is in contact with the ground. Or else, this can cause the machine body to fall. Operators need to pay special attention to this aspect. With smooth mode selection the boom down safety valve setting is reduced, so that the machine body is not lifted during digging operation.

Hence, when the machine body falls impact on the undercarriage is eliminated resulting in enhanced durability and operators comfort too. Smooth mode should be used at all times and this comes in handy especially while gathering rock.

To sum up, we find that modern machines are equipped with features that are designed to improve productivity and focus on fuel saving. All we need is to use them to our advantage. Educating operators to effectively use these features is a task that everybody involved in machine utilization and upkeep has to shoulder.



Smooth Mode



Power Mode

In the next issue we shall focus on some equally interesting point. So, keep track of the next edition of L&T Earthmover News.

Komatsu PC3000—India's Largest Hydraulic Excavator



Komatsu PC3000 Hydraulic Excavator working in EMTA's site

Larsen & Toubro has introduced the super-large Komatsu PC3000 Hydraulic Excavator in the Indian Mining Industry. The first unit was successfully assembled by the combined team of L&T and Komatsu at Karnataka EMTA Coal Mines Limited site near Chandrapur in Maharashtra. Other three units have also been assembled and delivered at the same site. This product demonstrates Komatsu's advanced engineering and manufacturing technology in mining field. In bringing this product to the coal sector, L&T has accomplished a rare feat of being the first distributor to deliver this mammoth machine in the country.

Powered by 1260 HP engine, the giant excavator has a backhoe bucket of 15 cu.m and is a great attraction in the mines. Its operating weight is 250 tonnes. For optimum mining operations at EMTA's site, PC3000 is matched with Komatsu HD785 dump trucks. The continuous demand for this large-size mining shovel in Asia-Pacific Region has prompted Komatsu to supplement the product manufacture at its Rokko Plant in Japan, besides the regular production line established at its Dusseldorf plant in Germany.

Heavy-duty shovel undercarriage design with oscillating track shoe mechanism are incorporated in this giant equipment to maximise life in harsh mining ground conditions. High-quality cast track shoes are designed using finite element analysis. Precision hardening of contact surfaces using latest induction techniques ensures long-term performance.

The machine is offered with optimum performance and convenient serviceability in focus. Complete machine is delivered in pre-tested modules for faster erection on jobsite. Automatic central lubrication system for attachment and slewing ring is adjustable and monitored. The hydraulic pipe arrangement is designed to suit convenience and service access.

Hydro-pilot hydraulic system with electronic load governor, pump flow summation capability and oil flow priority enable fast working cycles and high productivity. Just one pressure setting for all main hydraulic circuits simplifies pressure adjustment and servicing. Each hydraulic circuit is protected with auto-monitored high pressure filters.

The equipment is available in front shovel and backhoe configuration, with a wide selection of buckets. Bucket wear packages are available to meet requirements of all applications. Sealed pins attachment minimizes wear and reduces costs.

The engine provided in this machine meets advanced technology, strict environment regulations and is EPA emission-compliant. Extended oil change and filter replacement intervals help reduce environmental impact.

A large, comfortable and safe mining operator's cabin is provided on this machine. Integrated FOPS structure cab mounted on viscous damping system, low noise and vibration, enhance operator comfort. Other features include the large heated rear view mirrors, pressurised cabin to keep dust out, highly efficient air-conditioning, high intensity lights and trainer seat.

The Electronic Text Monitoring (ETM) system, with easy to read text display, provides continuous monitoring of

all equipment functions and operating conditions. It has the capability to cover 1300 different messages. It also makes use of PROTOCOL Memory for recording of the fault messages and STATISTICS Memory for registration of duration of each event that occurs. The ETM works in the last and most important message mode which is indicated by flashing number on the screen and may be recalled any time. The system provides powerful yet easy means to monitor the equipment in all respects for optimizing productivity.

PC3000 also comes with the option of electric drive prime-mover of 6600/7200V with 50/60Hz rating. Its compact design leading to low vibration and noise meets all international standards.

For more details on this product, contact Mining Equipment Business, Lakshminarayan Complex, 10/1, Palace Road, Bangalore 560052 or Tel. No. 080-40401700 or e-mail to meb@pro.ltindia.com



The jubilant L&T and Komatsu service team that assembled the PC3000 mammoth machine

Product Update – Swiss record high reach

Komatsu PC1250 carrying a 55 m (180.5 ft) Kocurek boom is set to become the largest high reach demolition excavator operating in Switzerland.

The machine features the usual Kocurek modifications – lengthened and hydraulically extending undercarriage, additional counterweight that has a hydraulic removal assist, tilting cab and hydraulic boom disconnect to allow rapid changeovers from high reach to intermediate or

standard excavator boom. These additional elements have resulted in an overall machine weight with three stage high reach telescopic boom of 160 tonnes.

According to Kocurek's: "Aregger's PC1250 is probably the most versatile machine we have ever produced in terms of possible boom configurations."

Source: Lindsay Gale, Feb, 2008

L&T Showcases Products at IME 2008



Mr. H.C. Gupta, Secretary – Coal, Government of India and Mr. P.S. Bhattacharya, Chairman, Coal India Limited (1st and 2nd respectively from left) being briefed by Mr. Saneesh Kumar, Sales Development Manager, Mining Equipment Business, L&T, during their visit to L&T Stall.



Union Minister for Mines Mr T. Subbarami Reddy seen in L&T stall with Mr. K. Bose, Zonal Manager (East), Mining Equipment Business, L&T, Kolkata.

The opening up of mining for private sector in a big way and the concurrent initiatives in mining policy has brought in a new impetus. Capturing this trend, IME 2008 (International Mining, Exploration Mineral Processing Technology & Machinery Exhibition) hosted at Netaji Stadium, Kolkata from Jan 17-20, 2008 witnessed key participation from L&T Group of companies besides exhibitors from the public and private sectors. L&T put up two indoor stalls – one highlighting the products of Construction & Mining Equipment Business Unit (CMB) and the other for products manufactured by Kansbahal Works (KBL). The participation included display of photographs and miniature models of mining equipment.



Mr. R.P. Ritolia (third from left), Chairman-cum-Managing Director, Central Coalfields Limited, speaking to Mr. D. Banerjee, Head, Mining Equipment business, L&T (first from left) during his visit to L&T stall

Coinciding with the event, Mining, Geological & Metallurgical Institute of India organized the second Asian Mining Congress with participation from eminent speakers both from India and abroad. Topics related to the mining industry, eco-friendly operations and the concurrent challenges were actively deliberated in the interactive sessions. The exhibition was inaugurated by Mr Subhas Chakravarty, Minister of State for Transport, Govt of West Bengal.

The entire event was planned by TAFCON Group, in association with M/s. Coal India Limited, and supported by Ministries of Coal, Mines, Petroleum & Natural Gas, Steel, Power, Heavy Industries & Public Enterprises, Science & Technology and Planning Commission, Govt of India.



External views of KBL Stall



View of CMB stall

Customer Training & Service Camp at Jalore

A two-day customer training programme for Operators and Mechanics was conducted at Hotel Geetco, Jalore on 7th and 8th January, 2008. The aim was to enlighten the machine operators and mechanics about the standard maintenance practices and efforts to achieve optimum use of the machine. It was attended by representatives from Jalore, Bhinmal, Pali and Bijoliya areas. Technical session conducted by the Regional Training, Delhi covered topics related to machine



Interactive session in progress



The participants come together for a photo

features, recommended fuels & oils and preventive maintenance.

For operators, correct operating techniques and Dos & Don'ts during machine operation were also discussed. The session included training on spare parts with the help of cut-away sections and slide shows for the benefit of participants.



L&T's Construction Equipment Business, Udaipur and local dealer M/s. J.E. Enterprises jointly organized a two-day free service camp at Jalore area. During the camp, preventive maintenance checks were carried out on models PC200, PC300 and L&T 90. Operators were educated on good maintenance practices, importance of proper servicing of machines and correct use of genuine oils and filters.



Onsite training for operators

***Experience is not what happens to a man;
it is what a man does with what happens to him.***

– Aldous Huxley

Road Show-cum-Customer Meet



Mr. Joseph Zacharia of M/s. Cinzac Corporation, Kochi lighting the lamp in the presence of Mr. V.R. Subramanian, Branch Manager, L&T, Kochi and Mr. R. Ramani, Zonal Manager (S2), L&T, Bangalore (2nd & 3rd respectively from right), to mark the inauguration of the road show



One of the proud owners of the machine receiving the key at the Road Show in Gulbarga



Some of the visitors at the Road Show in Thodapuzha near Kochi

L&T's Construction Equipment Business, along with local dealers M/s. Cinzac Corporation, Kochi and M/s. Anugraha Construction Equipment Services & Support Pvt.Ltd, Bangalore organized road shows and customer meets during the last quarter of the financial year 2007-08.

In Kerala, the road show was held at Thodupuzha, near Kochi on February 05, 2008. In Karnataka, the road shows were held in Gulbarga on February 06, 2008, in Bidar on February 08, 2008 and in Mysore on March 11, 2008.

The events were aimed at increasing awareness amongst customers on the merits of the 'little giant' L&T-Komatsu PC71, its multi-user applications, and after sales parts and service support from the Dealers. The events attracted a large number of contractors and hirers.



Group photo of customers along with dealer and L&T team at the Road Show in Bidar



Customers being briefed at the Road Show in Mysore

Deccan is New Dealer in Gujarat

L&T has appointed M/s. Deccan Earthmovers (a Division of Deccan Sales & Service), Ahmedabad, as a new authorized dealer for its Construction Equipment Business for the entire state of Gujarat.

Deccan Earthmovers' Head Office and Main Store was inaugurated on 21st January 2008. Representatives from Adani Port Limited, Gujarat Mineral Development Corporation, Hindustan Marbles, Dhorajia Construction,



Mr. Kailash Varma, Assistant Vice-President, Head - Commercial PMC Project (Adani) Mundrapur Port, cutting the ribbon in the presence of Mr.S.K.Mittra, L&T.



Mr. S.K. Mittra lighting the lamp to mark the inauguration

New Stone Quarry and Vinay Construction, were present during the inauguration.

Deccan Earthmovers has also opened branch offices at Surat, Rajkot and Gandhidham to facilitate customers with better product support. All the branch offices are equipped with service engineers and parts depots.

L&T Trains Drivers on Scania Operations

As many as 150 tipper drivers were imparted training on Scania tippers at customer sites in Ramagundam and Singrauli during the last quarter of 2007-08. The operators were trained on several aspects of brake dynamics and equipment maintenance through structured modules developed by L&T's Training Department in association with Scania Product Department.

The training coincides with L&T commissioning the first lot of 25 Scania trucks for M/s. V Prabhakar Reddy & Co (VPR) at Singareni Collieries Company Limited, OCIV Medapalli Project in Andhra Pradesh. This is part of the breakthrough order for 40 trucks placed by

VPR – one of L&T's esteemed customers. VPR is one of the top contractors engaged in overburden removal in coal mines in South India and has an annualised turnover of Rs 150 crores. Another important customer for Scania tippers is Gulf Oil Corporation Limited (GOCL), which has placed order for 15 Scania tippers for deployment at Northern Coalfields Limited, Nigahi Project in Singrauli area. GOCL's Industrial Explosives Division has taken up contract mining operations of drilling, blasting and excavating in coal mines. The tippers have been commissioned at the site and are working to fullest satisfaction of the users.



Scania Tippers lined up at VPR's site prior to commissioning

Komatsu Wheel Dozer WD600 at NMDC



Komatsu WD 600-3 in operation at one of the job sites

Komatsu Wheel Dozer Model WD600-3 – the first of its kind in the country- has been supplied to M/s. National Mineral Development Corporation (NMDC), at Bailadila project in Chattisgarh and commissioned in September 2007. Wheel Dozers which are powered by Komatsu SAA6D170E-3, air-to-air aftercooled, turbo-charged diesel engine developing net power of 362kW (485 HP) at 2000 rpm and having a straight tilt blade of 8 cu.m capacity, are being deployed for dozing iron ore and other applications.

This integral-designed Komatsu Wheel Dozer offers the best value, reliability and versatility. Hydraulics, power train, frame and all major components are engineered by Komatsu and to work together for higher production, greater reliability and more versatility. It comes with a host of features.

The cabin improvements on the WD600-3 go beyond providing a large cab with a comfortable air-ride seat. Improvements include these production-enhancing standard and optional features:

A large flat glass windshield provides the operator an unobstructed view of the working area and attachment.

Electric power windows allow the operator to open windows without reaching or leaving the comfortable air-ride seat.

Two-door, walk-through cab - Good for ventilation as well as easy entry and exit from either side of the cab.

Silicone-filled rubber mounts dampen noise and vibration, reducing fatigue caused by noise. Helps keep the operator productive, all day.

Low-effort brake pedals actuate fully hydraulic brakes. Service brakes utilize two hydraulically-actuated independent circuits for increased safety and are adjustment free, fully-sealed, wet disc units, preventing intrusion of dirt and dust. Since the brake system does not use air, it provides many benefits such as absence of condensation, dependable braking even in cold conditions, no need for drainage and rust free piping. Charging time after engine starting is drastically shortened and pedal effort is reduced.

Steer with ease - Komatsu's fully hydraulic steering provides fast response with low effort, even at low engine rpm.

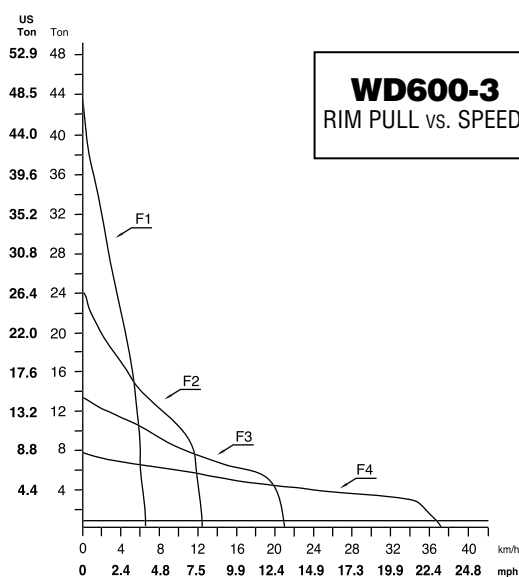
Optional joystick/steering wheel control - The optional joystick and steering wheel control system provides precise steering operation. The joystick steering is ideal in tight conditions, and the steering wheel is available when roading. The combination of these two systems provides a convenient, comfortable, and versatile option to fit all operators and operating conditions.

See the monitor through the steering wheel, not around it. A specially designed two-spoke steering wheel allows the operator to easily see the instrument panel.

Kick-down switch is conveniently located on the blade control. A simple motion of the thumb actuates this valuable productivity feature.

Automatic transmission - Automatic shift control gives the operator maximum control with minimum effort. The transmission hold switch allows the operator to select either automatic or manual shifting. The unique combination of the transmission hold and kick-down switches, located on the hydraulic blade control, offers the operator optimum control in all conditions.

At-a-glance instrument monitor - Monitor is mounted in front of the operator and is tilted for easy view, allowing the operator to easily check gauges and warning lights.



EDIMOS II (Electronic Display Monitoring System) monitors all machine functions and systems, which are only a glance away on the side panel.

Other features:

New emission engine - Komatsu SAA6D170E-3 diesel engine provides greater productivity, serviceability and reliability. Engine oil and filter change intervals have been increased from 250 hours to 500 hours.

Lights - Externally mounted halogen lamps for better operator's visibility for operating at night.

Buffer rings for Cylinders - Reduces shock loads to the cylinder packings and prolongs cylinder life by approx 30%.

Blade tilt piping - This feature is built into the blade push arms for maximum protection.

Large fuel tank - The large capacity rear mounted fuel tank allows for ground level fueling.

Easy access for servicing - Large doors lock with cab key. Easy access is provided to all engine service points and filters. Low mounted battery boxes facilitate easy checking and servicing. Ground level greasing in centralized service banks reduces and simplifies maintenance.



Rear view of Komatsu WD600-3 Wheel Dozer