

# Drive Train Systems & Support



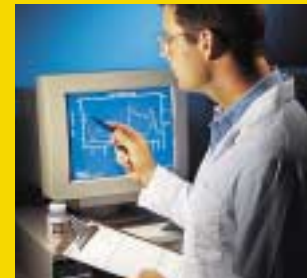


# Superior Performance and Lower Costs



Caterpillar® final drive and transmission parts work together to transmit power to the ground and propel Cat® earthmoving equipment through a variety of applications all over

the world. Caterpillar designs and manufactures the highest quality drive train systems in the industry,



and we work with you to achieve superior machine performance—







offering genuine Cat  
excellent maintenance



drive train parts, along with  
and repair options when you

need them. The results are maximum machine productivity and lower owning and operating costs.

# Superior Drive Train Parts—To Work Your System Hard

Drive train components  must endure incredible torque, high-impact loads, and frequent direction and gear changes. Caterpillar  designs and manufactures  its transmission and final drive components with these demands in mind, using testing  processes that simulate real  world applications. The result is a drive train system  lasts longer and works harder over the life of your machine.



# Caterpillar drive train parts are designed, manufactured, and tested to deliver reliable performance and long life.

## Transmission and Final Drive



### Gears and Pinions

*Precise manufacturing for increased wear resistance*

- Special heat treatment ensures proper surface and core hardness to resist impact loading, case crushing, tooth breakage, and pitting.
- Shaved gear tooth surface prevents excessive contact stresses on mating teeth and reduces pitting.

### Anti-friction Bearings

*Special features for improved lubrication and load distribution*

- Smoother surface finish on races and rollers leads to lower rolling resistance and friction and longer life.
- Rounder roller crown distributes loads across rollers to prevent gear misalignment.

### Duo Cone Seals

*Unique design for contamination resistance*

- High-alloy steel rings provide corrosion and abrasion resistance.
- Precision-lapped surface seals in lubricants and keeps out contaminants.

## Transmission



### Planet Shafts

*Specially crafted for maximum bearing life*

- Precise tolerances resist premature bearing failure.
- Special surface finish allows maximum needle bearing life and performance with minimal rolling resistance.

### Carriers

*Precise design for efficient power flow and less wear*

- Precise shaft hole locations provide correct mesh and load distribution between gears and proper tooth contact for efficient power flow.
- Special thrust washer face surface finish helps prevent wear and reduce gear misalignment.

### Brake Discs/Plates

*Superior construction for wear resistance and long life*

- Porous fiber face on each side of disc ensures that a thin film of oil separates discs and plates to minimize wear.
- Uniform ridge patterns on discs promote oil flow to keep brakes from reaching excessively high temperatures.

### Brake Linings

*Quality materials for improved strength and reduced wear*

- Heat-resistant materials maintain strength under high operating temperatures.
- Specially designed linings absorb wear to reduce the need for disc replacement.

## Final Drive

### Shafts

*Exacting design for proper measurements and hardness*

- Precise machining ensures proper taper lengths, key slot depths and widths, and gear alignment.
- Special heat treatment achieves proper surface hardness, core hardness, and hardened depth.



# Expert Drive Train Management—To Make Your System Last



Since drive train components are hidden from view, it is easy to overlook maintenance. Yet effective system management leads to fewer failures, less downtime, and

better machine resale value. A good drive train management program

is a team effort—your regular maintenance program supplemented by our maintenance products and services.



Together, we can maximize drive train and component performance, identify

and head off any potential problems, and lower your owning and operating costs.



## Maintaining your system lowers your operating costs

An effective drive train maintenance program lowers your operating costs by increasing machine life and availability, optimizing component life, and reducing unplanned downtime. We can help you make the right maintenance decisions at the right time—so you can keep your equipment in excellent condition.



### ***PM program improves system performance and life***

We make preventive maintenance (PM) easy with convenient PM checklists customized to your special application or requirements using Preventive Maintenance Planner (PMP) software. We can also provide customized PM kits for your Cat machine models. Using genuine Caterpillar filters and oil will help assure the drive train components of your Caterpillar machines obtain the life and performance built into them.

### ***New Caterpillar oil reduces downtime and oil disposal***

Caterpillar Transmission/Drive Train Oil (TDTO) is specially formulated to increase the life and performance of your Cat drive train components. Now, Caterpillar offers a new multiseason formulation of TDTO called TDTO (TMS). This Caterpillar exclusive is a partially synthetic lubricant which eliminates the need to change oil at seasonal intervals. This means using the oil for its full life, less used oil disposal, and less downtime for maintenance.

### ***S•O•S<sup>SM</sup> fluids analysis provides quick, accurate analysis***

Our S•O•S program is the best way to monitor your drive train and forecast wear-related problems. Many oil labs can evaluate oil composition and report obvious problems, but expert interpretation of oil analysis information is the key to effective drive train management. Our factory trained experts understand your Cat drive train systems and can interpret sample results to assure the drive train components of your Caterpillar machines obtain their full design life.

Caterpillar's S•O•S Trend Analysis Module (TAM) software provides oil analysis results electronically and immediately. This Windows based software lets you eliminate paper copy reports entirely or just print the reports you need. You can also graph or chart results to better understand the wear trends occurring in your machines.

### ***Regular inspections save you time and money***

We can help you with daily inspections and periodic in-depth examinations by evaluating repair indicators, customizing checklists for your operators, and performing Technical Analysis or Repair Determination Inspections.

Regular inspections will help you catch minor problems before they lead to major expenses and unscheduled downtime.



**Caterpillar Multiseason Transmission/Drive Train Oil eliminates the need for seasonal oil changes, and it is formulated to assure the full design life of your drive train components.**





## Managing your system makes the most of your investment

Keeping track of maintenance is an important task—one that is easy to put off until skipped maintenance causes a problem. We can help you manage your drive train system by training your staff, developing an effective scheduling program, and setting up manual or computerized record-keeping systems. With proper system management, you can lower your repair costs and reduce your unscheduled downtime.





### ***Staff training improves maintenance practices***

Our experienced instructors can conduct training meetings and seminars, or we can provide you with training plans and materials. We can customize training for your personnel to help you improve maintenance practices.

A properly trained staff can perform regular drive train maintenance and recognize repair indicators. That means you can catch minor problems before they become major ones, reducing maintenance and repair costs and minimizing costly unscheduled downtime.

### ***Scheduling program keeps your machines up and running***

We can help you develop an effective scheduling system by providing you with time and cost record booklets or software programs.

Use Maintenance Control System (MCS) software to schedule your maintenance and record machine operating costs and time usage. This Windows based system is specially designed for users of Caterpillar equipment, but is used in many other applications. MCS will also accommodate downloading of S•O•S reports from Trend Analysis Module (TAM) software. Customized checklists from the Preventive Maintenance Planner software can also be brought into MCS and printed when each level of maintenance is due.

With a proper scheduling system, you can ensure that all of your maintenance, inspections, and planned repairs are done on time—so you can prevent the failures and unscheduled downtime that may result from overlooked maintenance.

### ***Accurate records help you improve profitability***

We can help you set up manual record-keeping and work order systems, or we can help you install computer software programs that will perform scheduling, checklist, and record-keeping functions.

By developing an accurate machine record-keeping system, you can identify high cost or problem areas, track work flow, control costs, and increase machine resale value.



# Dependable Drive Train Service—To Fix Your System Right



When you need drive train repairs, we can restore system performance and get your machines back to work quickly and reliably. We help you

evaluate repair indicators and determine repair options. We give you costs up-front,



the lowest cost and we stand

behind our work. Our service professionals have the training

and



technology your overall expenses.

to handle all levels of repairs, reducing service requirements and your repair



### **Before-Failure Repairs**

Because of the integrated nature of the drive train system, the failure of one part often causes the premature failure of related parts. Repairing before failure means lower repair costs and maximum utilization of component life. In fact, identifying and correcting a problem before failure costs two to three times less than repairing after failure. Our before-failure repair options include:

#### ***Transmission and Final Drive***

- Rebearing and reseal
- Before-failure overhaul

#### ***Final Drive***

- Upper pinion rebearing and reseal
- Steering clutch and brake reconditioning

### **After-Failure Repairs**

If your drive train does fail, you still have many economical repair options. Our off-the-shelf Cat Exchange components and liberal core credit policy can help lower your repair costs and keep downtime to a minimum. We work with you to make sure you get the fastest, most cost-effective repair option. Our after-failure repair options include:

#### ***Transmission and Final Drive***

- After-failure overhaul
- Exchange

### **Remanufactured Parts**

Our Exchange and Cat Reman parts carry a "same-as-new" parts warranty but cost far less than new. The remanufactured parts we offer include:

- steering clutch and brakes.
- transmissions and torque converters.
- final drive groups.
- brake bands and shoes.



## **Commitment of service and support**

We're committed to helping you maximize your productivity and lower your costs. We're committed to your success.

Ask us how we can use the Customer Support Agreement process to achieve these results.



For more information, see us today  
or visit our Web site at [www.CAT.com](http://www.CAT.com)