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Caterpillar

Service Manual

Troubleshooting

Guide

Volume 1 of 4

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Service Manual

CT-S-GUIDE



GUIDELINE FOR REUSABLE PARTS

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INDEX OF PUBLICATIONS ON REUSABILITY OR REPAIR OF USED PARTS

This Bulletin gives an index of the GUIDELINES FOR REUSABLE PARTS and other service literature which have information on the reusability and/or repair of used parts and the tools needed to make the repairs. Put this Bulletin in the front of the binder for Guideline For Reusable Parts. A good binder to use for this purpose is the blue "Service Information" 3-ring binder, Form No. FE040034. Also, decals are available for "Guideline for Reusable Parts," Form No. SEED0001, to identify the binder. Order both on a Miscellaneous Materials Order.

The form numbers and titles of the current GUIDELINES FOR REUSABLE PARTS that have been printed as of March 15, 1982, are:

SEBF8001-01	Pistons and Cylinder Liners
SEBF8002-01	Valves and Valve Springs
SEBF8003	(Canceled—Information now in SEBF8005-02)
SEBF8004	1T237 Output Flange Assembly for Torque Converters on D8 and D9 Tractors
SEBF8005-02	Repair of Pump Drive Gear for Torque Converters
SEBF8006-03	Clutch Housings and Clutch Pistons for Transmissions and Torque Dividers (Also—See SM June 27, 1977)
SEBF8007	1T595 Carrier for Torque Converters on D8 and D9 Tractors
SEBF8008-01	Turbine Wheels for Torque Converters (1T20, 1T52, 1T79, 1T221, 1T245, 1T842)
SEBF8009-01	Main and Connecting Rod Bearings
SEBF8010-01	3S1274 and 3S1261 Center Shafts for Transmissions on D8 and D9 Tractors
SEBF8011-01	1T787 and 1T657 Freewheel Side Plates for Torque Converters
SEBF8012	3S9919 Center Shaft for Torque Dividers on D8 and D9 Tractors
SEBF8013	Transmission Clutch Plates and Discs
SEBF8014-02	Transmission Clutch Plate Identification
SEBF8015	(Canceled—Information now included in SEBF8001-01)
SEBF8016	1T149 Clutch Race used in 3-Speed Torque Divider Transmission
SEBF8017	Clutch Ring Gears for All Power Shift Transmissions
SEBF8018-01	Turbochargers
SEBF8019-02	Turbocharger Specifications
SEBF8020	Wear Sleeves for Shafts
SEBF8021-02	Transmission Bevel Pinion Gear and Transfer Gears for D5, D6, D7, D8 and D9 Tractors
SEBF8022	Sealed and Lubricated Track
SEBF8023-01	Center Shafts for Planetary Transmissions on D6 and D7 Tractors, 977 Loaders and 571 and 572 Pipelayers
SEBF8024	(Canceled—Information now included in SEBF8002-01 and SEBF8034)

SEBF8025	Steel-Backed Bronze Plates for Vane-Type Hydraulic Pumps
SEBF8026	Lift Truck Hydrostatic Transmission
SEBF8027-01	Specifications for Reusable Lift Truck Hydrostatic Transmission Components
SEBF8028	1S5573 Idler Shaft and 5S7060 Case Assembly for Power Shift Transmission on 621, 623 and 627 Tractor-Scrapers (See SM Supplement, January 16, 1978)
*SEBF8029-08	Index
SEBF8030-02	Procedure to Measure Bent Crankshafts
SEBF8031	Transmission Clutch Plates and Disc Assemblies with F37 Clutch Friction Material
SEBF8032	Piston Pumps & Motors
SEBF8033-01	Piston Pump and Motor Specifications
SEBF8034-02	Valve and Valve Spring Specifications
SEBF8035	Specifications to Machine Reaction Faces for Power Shift Transmissions
SEBF8036	Transmission Parts Damaged by Cast Iron Seal Rings
SEBF8037	Tractor and Scraper Brake Drums
SEBF8038	6D7995 Circle Reverse Housing On 12F and 14E Motor Graders
SEBF8039	Inspection Of Crankshafts for Cracks
SEBF8040	Procedure To Straighten Bent Crankshafts
SEBF8041-01	Crankshaft Measurement (See also SM, July 13, 1981)
SEBF8042	Procedure to Polish Crankshafts
SEBF8043	Visual Inspection Of Crankshafts (See also SM, July 13, 1981)
SEBF8044	Repair Of Loose Blades In Torque Converter Stator Wheel Assemblies
*SEBF8045	Lift Truck Engine Timing Gears (1404, F163, F227, Perkins Engines)
*SEBF8046	Cast Iron and Steel Engine Pulleys
*SEBF8048	Procedure to Machine Damaged Transmission and Differential Yokes

Other information has been printed in other service publications during the last several years that can be used in your "Reusable Parts" program. The index that follows gives you the literature abbreviation, the title of the article, form number and date of publication when necessary. The Guidelines for Reusable Parts (GRPTS) have also been included in this index to give you one complete reference source.

The definitions of the literature abbreviations used in this index are:

EN	— Engine News
LTTB	— Lift Truck Technical Bulletin
GRPTS	— Guideline for Reusable Parts
SI	— Special Instruction
SM	— Service Magazine
SPPUB	— Special Publication
SRVMA	— Service Manual
TP	— Technical Partsgram
URG	— Undercarriage Reconditioning Guide

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The index is arranged numerically by Service Management Control System code number. For a list of the SMCS codes, see Form No. SEBF3005—"Code

Structure for the Service Management Control System" and SEBF3017—"Classification Codes for Service Literature".

SMCS Code	Publication	Title	Form No.	Date
GENERAL				
160	SM	Use Again Maximum	SEBD1520	Aug. 29, 1975
160	SM	A Comparison of "Use Again Maximum" and "Maximum Permissible Wear"	SEBD1531	Dec. 17, 1975
0374	SM	Caterpillar Remanufactured Products Catalog Is Now Available	SEBD1022	June 23, 1980
0374	SM	Caterpillar Remanufacturing Programs	SEBD1005	Feb. 4, 1980
0622	SM	6V2010 "Arkansas" Polishing Stone	SEBD1923	June 25, 1979
*0651	SM	6V6059 Microlite Available for 6V2196 Inspection Microscope	SEBD1210	Mar. 15, 1982
*0653	SM	Instruction Cards for "Go-No Go" Gauges Now Available	SEBD1120	May 25, 1981
0653	SM	6V2196 Microscope Available for Inspection Purposes	SEBD1026	Aug. 11, 1980
0670	SM	Size of Glass Beads is Important When Used to Clean Engine & Turbocharger Parts (also, EN, November 28, 1979)	SEBD1937	Oct. 22, 1979
0670	SM	Tools for Gasket Removal and Surface Reconditioning	SEBD1926	Aug. 6, 1979
0675	SM	6V83 Emery Polishing Paper (Grade 4/0)	SEBD1902	Jan. 15, 1979
0680	SI	Using Caterpillar Replacement Thread Inserts	GMG00081	Sept. 1975
ENGINE (GENERAL)				
1000	SM	Engine Rebuild Procedures for D346, D348 and D349 Engines (Supplements, Sept. 9, 1975, SM, October 27, 1980 SM)	SEBD1512	May 15, 1975
1000	SRVMA	Reconditioning Procedures-4.5" Bore, V8 Direct Injection Engines	SENR2031	Aug. 1979
1000	SPPUB	Successful Engine Service (3208 Engines)	SEBD0509	Jan. 1978
1000	SPPUB	Engine Bearings and Crankshafts	SEBD0531	Nov. 1980
AIR INDUCTION AND EXHAUST				
1052	SPPUB	Analyzing Turbocharger Failures	FEG45138	—
1052	SM	Cartridge Repair Kit Available For AiResearch Turbochargers	SEBD1030	Sept. 8, 1980
1052	TP	Turbocharger Information System	SEBD2020-01	—
1052	TP	Turbocharger Assembly Identification	SEBD2021-03	—
1052	SI	Using 9S9143 Turbocharger Positioning Gauge	GMG00579	May 1970
1052	SI	1N4481 Turbocharger Cartridge Repair Kit	SMHS7790	Oct. 1980
1052	SI	Turbocharger Reconditioning - General	SMHS6854	Nov. 1975
1052	SM	Repair of Seal Grooves in Shaft and Wheel Assemblies for Turbochargers (Supplement, May 3, 1976)	FEG02593-01	Jan. 19, 1973
1052	SM	Side Clearance for Seal Ring in T18 Turgochargers (Supplement, May 4, 1973)	FEG02593-04	Mar. 7, 1973
1052	GRPTS	Turbochargers	SEBF8018-01	Jan. 1980
1052	GRPTS	Turbocharger Specifications	SEBF8019-02	Aug. 1980
1053	TP	Turbocharger Assembly Repair Information	SEBD2022-03	June 1976
1053	SM	New Bearing Sizes and Identification Codes for AiResearch Remanufactured Turbocharger Cartridges	SEBD1043	Dec. 15, 1980
1053	TP	Turbocharger Cartridge Identification	SEBD2023-03	—
1053	TP	Turbocharger Cartridge Repair Information	SEBD2024-03	—
1053	SM	More Optional Sizes of Turbocharger Bearings	SEBD1928	Aug. 20, 1979
1053	SI	Instructions for the use of 5P6518 Fixture Group for Parts Reusability of Turbocharger Shafts	SMHS6998-01	July 1979
1063	SM	Field Repair of Cooler Cores Made of Aluminum (Aftercoolers)	SEBD1728	Sept. 5, 1977
CYLINDER HEAD ASSEMBLY				
1100	SI	Installing Heli Coil Inserts in Caterpillar Cylinder Heads	SMHS7697	Mar. 1980
1100	SM	Reconditioning of Cylinder Heads for 6.25" Bore Engines (Also EN May 5, 1975) (Supplement SM Aug. 22, 1977, EN Aug. 24, 1977)	SEBD1509	Mar. 31, 1975
1101	SI	Using 5P7333 Tool Group for Bridge Dowel Repair—3400 Engines	SMHS7072	April 1977
1101	SI	Reconditioning of Cylinder Heads for use on Spacer Plate Cylinder Blocks (D342, D353)	SMHS7339	April 1978

SMCS Code	Publication	Title	Form No.	Date
CYLINDER LINER SEATS & INSERTS (Cont.)				
*1217 1201	SI	Use of 6V4840 Tool Group to Install Water Ferrules with Liner Seat Insert (6.25" Bore and D339 Engines with Counterbored Blocks)	SMHS7982	Nov. 1981
1217	SM	5P936 Liner Seat (L-Shape) Insert for 6.25" Bore Engine Blocks with Counterbores	SEBD1927	Aug. 13, 1979
1217	SI	Installation of 8N6150 and 8N6742 Stainless Steel Cylinder Liner Bore Inserts (D342 Engines with Spacer Plate Block)	SMHS7585	July 1979
1217	SM	New Liner Seat Insert for No. 1 and No. 4 Cylinders of D353 Engines	SEBD1011	Mar. 31, 1980
CONNECTING RODS AND ROD BEARINGS				
1218	SM	Connecting Rod Changes and Replacement Information (3406, 3408, 3412)	SEBD1008	Mar. 3, 1980
1218	SI	Use of Piston Pin Bearing Removal and Installation Tools	SMHS7295-02	Feb. 1980
*1218	SM	6V3197 Spacer, 6V3041 Tool Group Available for Removal and Installation of Piston Pin Bearings	SEBD1112	Mar. 30, 1981
1218	SM	Locating Bushings for the 5P3550 Rod Boring Machine Will Now Hold Tapered Piston Pin Bushings	SEBD1815	April 17, 1978
1218	SI	Using the 5P3550 Rod Boring Machine	SMHS6870	Dec. 1975
1218	SI	Installing the 5P2009 Rework Group on the 2H6782 Connecting Rod Boring Machine	GMG02394	Aug. 1973
1218	SM	Connecting Rod Changes and Replacement Information (3400 Engines)	SEBD1008	Mar. 3, 1980
1218	SI	Using the 5P2050 Connecting Rod Checking Fixture	SMHS7366	Mar. 1978
1218	SM	Reconditioning of Connecting Rods Made Easier with Improved Boring Machine	SEBD1602	Jan. 19, 1976
1218	SM	Larger Bore can be made in Connecting Rods; Use Bearings with Larger Outside Diameter (Also, EN May 26, 1976)	SEBD1612	Mar. 29, 1976
1218	SM	Use 6V100 Tool Arrangement to Remove and Install Piston Pin Bearings (Tapered and Standard Connecting Rods)	SEBD1816	April 24, 1978
1218	SI	Use of Piston Pin Bearing Removal and Installation Tools	SMHS7295-02	Feb. 1980
1218 1219	SM	New Oversize Bearing for 1P9 Serrated Connecting Rods Available for Parts Service (Also, EN Nov. 19, 1978)	SEBD1635	Nov. 1, 1976
1218	SM	5P9705 Tapered Connecting Rod Tool Group—3208 Engines with Tapered Rod Bushings	SEBD1902	Jan. 15, 1979
1219	SM	6V2050 Tapered Rod Tool Group Available for Removal and Installation of Bearings (3300 Engines)	SEBD1020	June 9, 1980
1219	SI	Installation of Oversize Rod Bearings—D346, D348, D349	SMHS7016-01	Mar. 1980
1219	SI	Installation of Oversize Rod Bearings—D379, D398, D399	SMHS7114	Feb. 1977
ENGINE BEARINGS				
1230	GRPTS	Main and Connecting Rod Bearings	SEBF8009-01	Jan. 1981
1230	SM	New Centering Rings for Oversized Main Bearings	SEBD1920	June 4, 1979
1230	SM	Do Not Use 5B1161 Lead Wire to Check Bearing Clearance; How to Use Plastigage	SEBD1001	Jan. 7, 1980
1230	SM	New Main and Connecting Rod Bearings Have a Thicker Layer of Surface Material; Instructions for Identifying Wider Crankshaft Journals (D346, D348, D349) (See also SM February 2, 1981)	SEBD1932	Sept. 17, 1979
1230	SM	Fretting Material Must Be Removed Before Installation of New Bearings	SEBD1034	Oct. 6, 1980
1230	SPPUB	Engine Bearings and Crankshafts	SEBD0531	Nov. 1980
1230	SM	Visual Inspection of Main and Connecting Rod Bearings	SEBD1010	Mar. 24, 1980
1230	SM	Service Tips for Removal and Installation of Main and Connecting Rod Bearings in Chassis	SEBD1024	July 14, 1980
1230	SM	Main and Connecting Rod Bearings with Cavitation Erosion Can Be Used Again (D346, D348, D349)	SEBD1012	April 21, 1980
1230	SPPUB	Bearings in Caterpillar Engines	SEBD0532	Nov. 1980
1230	SPPUB	Bearing Performance and Failure Analysis 3208 Truck Engines	SEBD0528	Nov. 1979

SMCS Code	Publication	Title	Form No.	Date
FUEL SYSTEM				
1253	SM	Service Bearings for Sleeve Metering Fuel Pump Housing	SEBD1916	May 7, 1979
1253	SI	Installation of 5P4810 Bearing in Sleeve Metering Fuel Injection Pump Housing. See Supplement in SM, May 7, 1979.	SMHS6735	Oct. 1975
1253	SI	Installation of 8N628 Bearing in Sleeve Metering Fuel Injection Pump Housing	SMHS7343	—
*1253	SM	Use 6V4068 Tool Group to Machine Camshaft Thrust Face (3208 Engines Equipped with Sleeve Metering Fuel Systems)	SEBD1127	July 6, 1981
*1254	SM	Use 6V4089 Reamer Assembly to Clean Nozzle Bores (1100, 3100, 3200 and 3300 Series Engines with Direct Injection)	SEBD1116	April 27, 1981
1254	SM	List of Correct Fuel Injection Nozzle Assemblies to Use for Different Engine Applications (6.25" Bore Vee Engines)	SEBD1036	Oct. 20, 1980
1254	SM	New Tube Assemblies are Available to Test Fuel Nozzles (3306 DI Turbocharged Engines)	SEBD1016	May 12, 1980
1254	SM	Some Test Procedures and Specifications Changed for 9L6884 Fuel Injection Nozzle Assemblies (3406, 3408, 3412)	SEBD9034	Sept. 29, 1980
**1254	SI	Use of 5P4150 Nozzle Testing Group and 8S2245 Nozzle Cleaning Kit	SEHS7292-03	June 1981
1254	SM	Test Specifications for 9N3979 and 9N2366 Pencil-Type Fuel Nozzles	SEBD1921	June 11, 1979
1254	SM	5P7448 Adapter to Test Earlier Fuel Injection Nozzles	SEBD1737	Oct. 31, 1977
*1259	SM	Bent Lever For Shut-Off Solenoid Can Cause Low Engine Performance (3208)	SEBD1204	Feb. 1, 1982
*1264	SM	FT1585 Plate Can Be Fabricated for Governor Spring Guide Replacement (3300 Direct Injection Engines with Scroll Fuel System)	SEBD1114	April 13, 1981
1264	SI	Use of Tools to Replace Worn Governor Spring Guides	SMHS7356	June 1978
1264	SI	Use of FT1525 Alignment Pin and FT1526 Salvage Fixture for Reconditioning of 3208 Governor Housings	SMHS7760	July 19, 1980
*1278	SM	Inspection and Test Procedures to Follow When Fuel Ratio Control Does Not Operate Correctly (3400 Series Engines)	SEBD1102	Jan. 19, 1981
1286	SM	Use the FT1525 Alignment Pin and FT1526 Fixture When Reconditioning Earlier 3208 Sleeve Metering Fuel Systems	SEBD1016	May 12, 1980
LUBRICATION SYSTEM				
1307	SI	Use of 5P8709 Tool Group for Alignment of Piston Cooling Jets	SMHS7267-01	July 1979
COOLING SYSTEM				
1350	SPPUB	Know your Cooling System	SEBD0518	1978
*1361	SM	New Water Pump Rebuild Kit (3204)	SEBD1207	Feb. 22, 1982
1361	SM	Use Insert to Repair Bearing in Water Pump Housing (Also, EN Apr. 6, 1977)	SEBD1707	Mar. 7, 1977
1361	SM	New Retainer and Improved Housing Keep Water Pump Bearing Tight: Repair for Loosened Bearing (Also, EN April 6, 1977) See Supplement, Jan. 23, 1978	SEBD1710	April 11, 1977
1361	SI	Water Pump Reconditioning Using the 9N3139 Rebuild Kit and 5P7361 Tool Group	SMHS7090	April 1978
1361	SM	Special Tools for Complete Repair of Water Pump in Direct Injection Engines	SEBD1713	May 2, 1977
1361	SM	Reconditioning 3208 and 3204 Water Pumps	SEBD1821	May 29, 1978
1374 1375	SM	Field Repair of Cooler Cores Made of Aluminum	SEBD1728	Sept. 5, 1977
ELECTRICAL SYSTEM				
1400	SI	Use of 6V3025 Battery Cable Repair Kit	SMHS7677	May, 1980
1405	SM	Brush Kit Available for Service Repair of Charging Alternators (D3, 910, 931)	SEBD1042	Dec. 1, 1980
1405	SM	Alternator End Frame Salvage	FEG00094-06	July 17, 1970
1408	SI	Use of 6V3000 Sure Seal Repair Kit	SMHS7531	June 1980

SMCS Code	Publication	Title	Form No.	Date
ELECTRICAL SYSTEM (Cont.)				
*1408	SM	6V4810 Tool Group to Service Environmental Connectors	SEBD1206	Feb. 15, 1982
*1408	SM	Use 5T3035 Harness Assembly to Replace Electrical Connectors for Shift and Synchronize Solenoids (627, 637, 639, 657, 666 Scrapers)	SEBD1210	Mar. 15, 1982
1412	SM	Analysis of Failures of Glow Plug Tips	FEG02582-08	Aug. 22, 1972
1412	SI	Using 1P550 Glow Plug Hole Rework Tool Group	GMG00253	April 1974
*1453	SM	Replacement Bushings for Delco-Remy Electric Starting Motors Must Be Machined for Correct Clearances (All Caterpillar Products with Delco-Remy Starting Motors)	SEBD1119	May 18, 1981
CLUTCHES AND MANUAL SHIFT TRANSMISSION				
3054	TP	Remanufactured Transmission Clutch Plates — Exchange Program	SEBD2411-01	—
3054	TP	Remanufactured Transmission Clutch Plates Identification	SEBD2412-01	—
TORQUE CONVERTER/DIVIDER				
3100	GRPTS	Repair of Loose Blades in Torque Converter Stator Wheel Assemblies	SEBF8044	May 1980
3100	GRPTS	1T237 Output Flange Assembly for Torque Converters on D8 and D9 Tractors	SEBF8004	Oct. 1975
3100	GRPTS	Repair of Pump Drive Gear for Torque Converters	SEBF8005-02	June 1979
3100	GRPTS	1T595 Carrier for Torque Converters on D8 and D9 Tractors	SEBF8007	Nov. 1975
3100	GRPTS	Turbine Wheels for Torque Converters 1T20, 1T52, 1T79, 1T221, 1T245, 1T842	SEBF8008-01	Oct. 1977
3100	GRPTS	1T787 and 1T657 Freewheel Side Plates for Torque Converters	SEBF8011-01	Oct. 1977
3100	GRPTS	3S9919 Center Shaft for Torque Divider on D8 and D9 Tractors	SEBF8012	Jan. 1976
3100	GRPTS	1T149 Clutch Race used in 3-Speed Torque Divider Transmission	SEBF8016	Jan. 1976
*3101	SI	Installation of 1T645, 1T1047 and 1T1347 Torque Converter Sleeve Bearings	SMHS7863	Jan. 1982
POWER SHIFT TRANSMISSION				
3150	SM	Reconditioning Eight-Speed Powershift Transmissions	SEBD1624	July 6, 1976
3150	GRPTS	3S1274 and 3S1261 Center Shafts for Transmissions on D8 and D9 Tractors	SEBF8010-01	Oct. 1977
3150	GRPTS	Transmission Clutch Plates and Discs	SEBF8013	Mar. 1976
3150	GRPTS	Transmission Clutch Plate Identification	SEBF8014-02	Sept. 1979
3150 3156	GRPTS	Transmission Clutch Plates and Disc Assemblies with F37 Clutch Friction Material	SEBF8031	Oct. 1977
3150	GRPTS	Clutch Ring Gears for All Power Shift Transmissions	SEBF8017	Jan. 1976
3150	GRPTS	Transmission Bevel Pinion Gear and Transfer Gears for D5, D6, D7, D8 and D9 Tractors	SEBF8021-02	Jan. 1980
3150	GRPTS	Center Shafts for Planetary Transmissions on D6 and D7 Tractors, 977 Loaders and 571 and 572 Pipelayers	SEBF8023-01	Nov. 1977
3150	GRPTS	1S5573 Idler Shaft and 5S7060 Case Assembly for Power Shift Transmissions on 621, 623 and 627 Tractor Scrapers (See Supplement SM, Jan. 16, 1978)	SEBF8028	Dec. 1976
3150	GRPTS	Specifications to Machine Reaction Faces for Power Shift Transmissions	SEBF8035	Nov. 1979
3150	GRPTS	Transmission Parts Damaged by Cast Iron Seal Rings	SEBF8036	Oct. 1979
3150	SM	Idle Gear Shaft with Shims Permits Correct Bearing Adjustment	SEBD1640	Dec. 13, 1976
3150	SM	Some Cracks in 8S5 Carrier Assembly in Planetary Transmission Group are Acceptable—657B Scrapers, 631C, 633C and 637 Tractors	SEBD1902	Jan. 15, 1979
*3155	SM	Remanufactured Clutch Plates Available for Power Shift Transmissions	SEBD1122	June 8, 1981
3155	SM	Improved Method to Check Transmission Clutch Plates and Discs for Distortion	SEBD1835	Sept. 18, 1978