Dealer Service Tool Catalog

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We provide specialized tools that work to reduce your customers' owning and operating cost, while increasing the productivity and the profitibility of your entire service operation.

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197-7875 Lock Removal Tool
197-7876 Connector Removal Tool

SMCS Code: 1800-0776
Model: All

- Used to service Caterpillar fuse blocks using mini-fuses (GM style)
- 197-7875 used to remove fuse block terminal locks
- 197-7876 used to remove wire and terminal from RTA, if replacement is necessary

Instructions for use of 197-7875

1. From rear side of RTA, insert tool fingers into slots on outboard side of wires.
2. With tool handle parallel to wires, press down on locking tabs of terminal locks.
3. Pull out terminal locks by hand or with a small, flat blade screw driver.

Instructions for use of 197-7876

1. Remove fuse from top of RTA.
2. Locate wire terminal on outboard sides of RTA.
3. Place long square fingers into square holes above and below slot for fuse blade.
4. Press removal tool fingers completely into connector to compress terminal locking tabs.
5. Remove wire and terminal.

6V-3000 Sure Seal Repair Kit

SMCS Code: 1400-023
Model: All models with Sure Seal connectors

- Used to repair any wiring harness which has Sure Seal Connectors
- Used to make new wiring harnesses for attachments or modifications to vehicles

Reference

SMHS7531-01 Special Instruction

Item	Part No.	Description
1	6V-3001	Crimping Tool
2	9G-3695	Sealing Plug (50)
3	6V-3008	Insertion Tool (not included with early kits)
4	7N-7779	Socket (100)
5	7N-7780	Pin (100)
6		Oil sample bottle used as container for alcohol lubricant (not part of 6V-3000 Repair Kit)

Item	Part No.	Description
7	Receptacles:	
	7N-7777	Receptacle, 1 pin (3)
	7N-9738	Receptacle, 2 pin (3)
	7N-7781	Receptacle, 3 pin (3)
	7N-8204	Receptacle, 4 pin (3)
	9G-3678	Receptacle, 5 pin
	9G-3677	Receptacle, 6 pin
	9G-3676	Receptacle, 7 pin
	9G-3675	Receptacle, 8 pin
	9G-3674	Receptacle, 9 pin
	9G-3673	Receptacle, 10 pin

Item	Part No.	Description
8	Plugs:	
	7N-7778	Plug, 1 pin (3)
	7N-9737	Plug, 2 pin (3)
	7N-7782	Plug, 3 pin (3)
	7N-8205	Plug, 4 pin (3)
	9G-3672	Plug, 5 pin
	9G-3671	Plug, 6 pin
	9G-3670	Plug, 7 pin
	9G-3669	Plug, 8 pin
	9G-3668	Plug, 9 pin
	9G-3667	Plug, 10 pin
9	6V-3007	Box Assembly
10		NEEG 2032 Insert

140-9944 Terminal Kit

SMCS Code: 1400-023, 0700
Model: All Caterpillar Engines

- Replaces discontinued 1P-2305 Terminal Kit
- Used to repair wiring harness terminal ends which have become damaged or unserviceable
- Hand crimping tool has built-in dies for crimping insulated and non-insulated terminals, cutting edges for cutting wire, notches for stripping 10 to 22 gauge wire, shears for cutting up to 4.7 mm (.18 in) diameter bolts, two thread chasers for screws with 24 and 32 threads-per-inch screws, and a scale for measuring screw length.
- Splice connectors have hot-melt adhesive and shrink ends that when heated will provide an environmental seal around wire.

Terminal and Wire Splice Service Parts

Quantity Shipped	Part No.	Description	Replacement Quantity
1	9S-9150	Terminal Crimp Tool	1
10	2L-8058	Terminal (8 Ga. 1/4 in. Stud)	10
10	2L-8066	Terminal (12-10 Ga. No. 10 Stud)	10
10	2L-8067	Terminal (12-10 Ga. 1/4 in. Stud)	10
10	2L-8069	Terminal (12-10 Ga. 3/8 in. Stud)	10
10	2L-8071	Terminal (12-10 Ga. 1/2 in. Stud)	10
20	2L-8075	Terminal (16-14 Ga. No. 8 Stud)	20
20	2L-8076	Terminal (16-14 Ga. No. 10 Stud)	20
15	2L-8077	Terminal (16-14 Ga. 1/4 in. Stud)	15
15	2L-8079	Terminal (16-14 Ga. 3/8 in. Stud)	15
30	5P-4571	Terminal (16-14 Ga.)	20
10	4S-1988	Terminal (Blade, Crimp Type)	50
15	136-4876	Wire Splice (12-10 Ga.)	1
15	136-4877	Wire Splice (16-14 Ga.)	1
15	136-4878	Wire Splice (22-18 Ga.)	1

152-7143 Cable Assembly (GSC Data Cable)

SMCS Code: 4450-038
Model: Generator Sets
Warranty: One Year

- Used to flash-program EMCP2+ Generator Status Control (GSC) module
- Used with universal communications adapter cable (139-4166)
- Requires Caterpillar ET and communication adapter (171-4400 or discontinued 7X-1700)
- Flash-programming only used for field updates

6V-2150 Starting/Charging Analyzer Group

SMCS Code: 1000-010, 1000-038, 1400-038, 1400-081, 1450-081
Model: All Models
Warranty: One Year

- Allows one person to quickly check 14 test points in starting and charging system on all 24-volt Caterpillar earthmoving machines made after July 1981, that have automotive type key start and are equipped with a diagonostic connector
- Identifies deteriorated starting and charging system components before they fail.
- Checks can be made with single connection to diagnostic connector on the machine, in the field and without removal of any sheet metal
- Works as voltmeter which gives an easy-to-read "go" or "no go" indication for all 14 test points
- 5.5 m cable permits test to be made in operator's seat of vehicle
- Checks not only condition of components and circuits with more speed and accuracy, but can also be used as part of Preventive Maintenance (PM) or Technical Analysis (TA) inspection; used this way, it can decrease possibility of sudden downtime in near future

Reference

SENR2947 System Operation Testing and Adjusting Manual
SEHS8145 Special Instruction (repair)

Weight	3.2 kg (7 lbs)
Size	394 mm x 311 mm x 102 mm (15.5 inch x 12.25 inch x 4 inch)
Cable Length	217 inch (5500 mm)
Power required	10 to 30 Volts at 250 mA from 24-Volt vehicle electrical system
Operating temperature range	-18°C to +60°C (0°F to 140°F)
Recommended storage temperature	-40°C to 80°C (-40°F to 176°F)

6V-3072	Case
6V-3112	Base — Plastic housing for test panel
6V-4174	Packing Set
6V-3178	Cable Assembly
NEEG2036	Instruction Decal
NEEG2041	Title Decal

110-4645 Adapter Cable Assembly (Starting/Charging Analyzer)

SMCS Code: 1400-081, 1450-081, 1400-038, 1450-038
Model: D5M, D6M, D6R, and D7R Track-Type Tractor
Warranty: One Year

- Used to connect machine to 6V-2150 Starting/Charging Analyzer Group
- Used to check 24 Volt starting and charging systems
- Overall length: 3 m (18 ft)

4C-4029 Trimmer Adjustment Tool

SMCS Code: 0785
Model: All Models
Warranty:

- Allows easier adjustment of small screwdriver adjustments found on VR3 and VR4 Voltage Regulators and 2301 Woodward Regulator Controls
- Constructed of glass-filled, nylon body with stainless steel blades; one end has recessed blade to provide captive screwdriver for adjustments that are difficult to see; other end has exposed blade to reach adjustments that are behind panels and have small access holes
- Gain and level controls on VR3 Voltage Regulator are inside regulator case and difficult to adjust when generator set is in operation; inability to see the control and vibration of regulator make fine adjustments very difficult
- Prevents broken controls on Woodward 2301 Controls caused by improper tool usage and excessive force required for adjustment when wrong tool is used

8C-9705 Converter, 12-Volt

SMCS Code: 1900-038, 0781
Model: 3406 PEEC, 3176 Engines
Warranty: One Year

- Provides power to discontinued 8T-8697 ECAP when used away from engine or vehicle being serviced; plugs into Port 1 on ECAP; can be switched to provide DC power to ECAP from either 120 or 240 Volts AC sources at either 50 or 60 Hz

NEXG4514 ECAP Executive/Utility Service Program Module

SMCS Code: 1900-038, 0781
Model: 3406 PEEC, 3176 Engines
Warranty: One Year

- Software [in Erasable Programmable Read Only Memory (EPROM) chip]
- Included in discontinued 8T-8697 ECAP; does not have to be ordered separately except for very early ECAP's with V1.0 installed
- NEXG4514 runs the ECAP; selects Metric or English display units; handles interface with SPM's in ECAP and interface with adapters connected to port 3; provides basic communication abilities with ports 1 and 2
- Current SPM may be marked NEXG4514 V1.1, 7X-1350 V1.1, or 8C-5363 V1.1; all three are same current software and will do same job; version number printed on SPM; also displayed on ECAP screen during power up self test and can be displayed on screen under SPM Version Number screen

Reference

SEHS8741 Special Instruction

NEXG4522 Truck Service Program Module, All Highway Truck Engines

SMCS Code: 1900-038, 0781
Model: All Highway Truck Engines
Warranty: One Year

- Software [in Erasable Programmable Read Only Memory (EPROM) chips] and subscription for updates
- Installed in discontinued 8T-8697 ECAP by customer to provide all service functions for all Highway Truck Engines
- Version number printed on module and can be displayed on ECAP screen under SPM Version Number screen compatible with all versions of all Highway Truck Engine control personality modules.

Reference

SEHS9349 Special Instruction
NEEG2501 Diagnostic Code Card
NEEG2502 Driver's Card

NEXG4516 Service Program Module, Marine/Industrial Engines

SMCS Code: 1900-036, 0782
Model: 3408, 3412 Marine/Industrial Engines
Warranty: One Year

- All Electronically Controlled Marine and Industrial Engines
- Software [in Erasable Programmable Read Only Memory (EPROM) chips] and subscription for updates
- Installed in discontinued 8T-8697 ECAP by customer to provide all service functions for all Highway Truck Engines
- Version number printed on module and can be displayed on ECAP screen under SPM Version Number screen compatible with all versions of all Highway Truck Engine control personality modules.

Reference

SEHS9199 Special Instruction, Using the ECAP NEXG4516 Marine/Industrial SPM (included with SPM)
NEEG2490 Pocket Card

NEXG4518 Service Program Module, Challenger 75

SMCS Code: 1900-038, 0781
Model: Challenger 75
Warranty: One Year

- Software [in Erasable Programmable Read Only Memory (EPROM) chip]
- Installed in discontinued 8T-8697 ECAP by customer to provide all service functions for 3176 Engine in Challenger 65/75/85 Tractor
- Version number printed on module and can be displayed on ECAP screen under SPM Version Number screen

Reference

SEHS9202 Special Instruction
NEEG2456 Diagnostic Code Card

NEXG4512 Configuration Aid Service Program Module

SMCS Code: 1900-038, 0781
Model: 3406B PEEC, 3176 Engines
Warranty: One Year

- Software [in Erasable Programmable Read Only Memory (EPROM) chip], installed in discontinued 8T-8697 ECAP by customer and subscription for update
- User friendly, menu driven interface to help determine values for Customer Specified Parameters; user defines configuration of truck by selecting values from lists of such items as: engine rating, axle ratio, transmission, tire size and type; custom values not in the lists can be entered by user
- Once configuration defined, program steps user through each Customer Specified Parameter; does all necessary calculations and checks values entered for validity and conflict with other parameters; also displays and defaults to typical values for each parameter
- Customer Specified Parameters, including all truck configuration information, can be saved in discontinued 8T-8697 ECAP internal memory for later use, even if power removed from ECAP; can be reviewed and changed, if necessary; program steps user through any parameters affected by change and provides same checking as when values were first entered
- List of configuration and parameter values can be printed using compatible serial interface printer; Split Chart can also be plotted; chart shows shift points for each transmission gear, along with engine RPM and vehicle speed limits
- When using NEXG4512 program, discontinued 8T-8697 ECAP can be powered by 8C-9705 12-Volt Converter or from electronic engine control using 8T-5275 T-Harness; 8C-9705 allows use of program with discontinued 8T-8697 ECAP in office or shop area; parameter values defined can then be printed or saved to discontinued 8T-8697 ECAP memory; 8T-5275 Cable allows program to read and write Customer Specified Parameters directly to and from electronic engine control
- Version number printed on module and can be displayed on ECAP screen under SPM Version Number screen (present version number V1.1)

Reference

SEHS88342 Special Instruction

1U-5470 Engine Pressure Group

SMCS Code: 1000-038, 1000-081, 1000-082, 1050-038, 1050-081, 1058-082, 1250-025, 1270-036, 1250-081, 1300-038
Model: All Models
Warranty: One Year

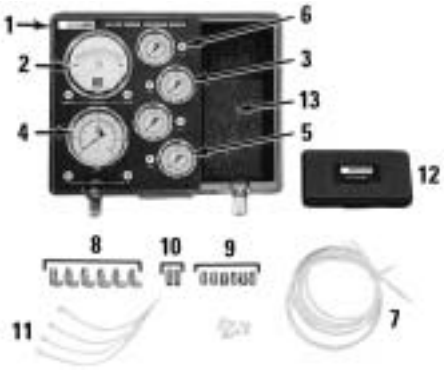
- Used to check performance of turbocharged diesel and natural gas engines and, with optional 1U-5554 Panel and 8T-0840 Pressure Gauge, to make operating adjustments to naturally aspirated gas engines
- Replaces discontinued 6V-3150 Engine Pressure Groups and 4S-6553 Engine Evaluation Test Group; contents of 6V-3150 still serviced, but contents of 4S-6553 no longer serviced; 6V-3150 can be upgraded to essentially same functional specifications of 1U-5470 by installing optional 1U-5554 Panel with either 0-200 kPa [0-60 inch mercury (Hg)] 1U-5469 Pressure Gauge (0-60 inch Hg) or 100-0-100 kPa (30-0-30 inch Hg) 8T-0840 Pressure Gauge
- Equipped with 4 different pressure gauges that indicate pressure relative to ambient atmospheric pressure; require no measurement corrections due to atmospheric pressure changes
- 8T-0848 Pressure Gauges used to measure fuel pressure, intake manifold pressure on turbocharged diesel engines, cooling system pressure and to power balance diesel engines in multiple engine applications (0-58 PSI)
- 8T-0846 Pressure Gauge used to measure oil pressure and air compressor cut-in and cut-out pressures (0-145 PSI)
- Chart in case lid used to convert kPa or PSI to inches of mercury as shown in Fuel Setting and Related Information microfiche
- 6V-6045 Accessories Case contains fittings that can be installed in all 1/8 inch NPT ports on Caterpillar Engines for setting up pressure taps for 1U-5470; 8T-0821 Tubing is easily connected to and disconnected from 1U-5470 panel and engine port fittings; internal O-ring seals tubing outer diameter and internal collet mechanism locks tubing into fitting
- Optional 8T-0840 Pressure Gauge used to measure intake manifold pressure on natural gas and gasoline engines and to power balance natural gas engines in multiple engine applications; mounts on optional 1U-5554 Panel Assembly which can be permanently installed in 1U-5470 Engine Pressure Group; 6V-4045 cannot be stored in 1U-5470 with optional gauge installed
- Optional slack tube 8T-0452 Water Manometer available for use with 1U-5470; measures static, vacuum, or differential pressure over range of 500 mm to 500 mm H_2O for total range of 1000 mm H_2O; stored in optional 8T-3153 Foam Block placed in lid of 8T-0841; optional 8T-3117 Foam Block can be used to store 8T-0452 in case lid of 6V-9450 Engine Pressure Group

8T-0848 Pressure Gauge range	400 kPa (58 PSI)
8T-0846 Pressure Gauge range	1000 kPa (145 PSI)
1U-5469 Pressure Gauge range of engine boost or positive intake manifold pressure	0 to 200 kPa (0 to 60 inches Hg)
8T-0839 Differential Pressure Gauge range	up to 12 kPa [50 inches water (H2O)], as well aseither 12 kPa (1.74 PSI) pressure or vacuum
All other gauges in group read directly in	kPa and PSI
8T-0840 Pressure Gauge range	0 to 100 kPa (0 to 30 inches Hg)
Vacuum range	0 to -100 kPa (0 to -30 inches Hg)
Operating temperature range	-1°C to 60°C (30°F to 140°F) for differential pressure gauges. -18°C to 71°C (0°F to 160°F) for all other gauges
Gauge accuracy	±2 percent of full scale for differential pressure gauge. SAE Grade A (±1.5 to 1 percent of full scale for all other gauges).
Operating position	Position has no effect on differential pressure gauge, if gauge has been mechanically adjusted to ZERO in the test position. On all other gauges, position has no effect on accuracy.
Pressure media	Differential pressure gauge — clean air and gases only (no liquids). All other gauges —air, gases and liquids (oil, water, antifreeze, fuel, etc.).
Size	390 mm x 310 mm x 190 mm (15.4 in X 12.2 in x 7.5 in)
Weight	6.8 kg (15 lb)

Optional 8T-0452 Water Manometer (SEHS8907, pg. 7)

Item	Part No.	Description
1	8T-0452	Water Manometer
2	8T-3153	Foam Block

NOTE: DO NOT use any acids or other highly corrosive liquids in the gauges.



Item	Part No.	Description
1	8T-0841	Case
2	8T-0839	Differential Pressure Gauge
3	8T-0846	Pressure Gauge
4	1U-5469	Pressure Gauge
5	8T-0848	Pressure Gauge (3)
6	4C-3974	Bulkhead Fitting (8)
7	8T-0821	Tubing, 16 m (52.5 ft)
8	4C-3973	Straight Connector (6)
9	4C-3972	Elbow Fitting (6)
10		C-3971 Union (2)
11	6V-6132	Cable Tie (4)
12	6V-6045	Accessories Case Form SEES5575 Accessories Label
13	6V-6115	Packing Set Base
Not shown		Form SEES5677 Conversion Chart
Not shown		Form NEEG2187 Title Decal

Optional 8T-0840 Pressure Gauge

Item	Part No.	Description
1	8T-0840	Pressure Gauge
2	1U-5554	Panel Assembly

Small to Medium Engine Burn Rate Meter Systems, with Hand Held Display or No Display

SMCS Code: 1250-036, 0782
Model: 3116, 3126, 3176, 3208, 3304, 3406, and 3408 Engines
Warranty: One Year

- Used to evaluate engine performance
- Provides extremely accurate (±1% of reading) measurement of burn rate

Burn Rate Meter

- Uses a positive-displacement, rotary piston burn rate meter to measure burn rate and a built-in heat exchanger to cool return fuel
- Air bubbles in return flow do not affect burn rate readings.

Burn Rate Computer

- 179-0701 Burn Rate Computer provides automatic temperature compensation and output scaling.
- Burn rate computer's microprocessor linearizes output signal and temperature to provide burn rate measurement accurate to ±1% of actual value.

Output Signals

- Includes frequency output signal to allow 131-5050 Dataview or 9U-7401 Multitach II to display burn rate
- Provides RS485 Communications for 154-8106 Fuel Flow Hand-Held Display
- 154-8106 Display flashes "UNDERFLOW" or "OVERFLOW" when fuel flow is out of the allowable range.

Power Supply

- Uses 11-32 volt DC engine battery with an optional 100-240 VAC power supply available
- The power switch on 179-0701 Burn Rate Computer must be in "OFF" position when connecting an AC power supply or the system will not power up.
- Not recommended for engines with supply fuel lines larger than a #10 JIC because of fuel flow restriction

Burn Rate Meter	
Burn rate	4 to 260 Lph (1.1 to 69.0 gph)
Accuracy	± 1% of reading, ± 0.4 Lph (.10 gph)
Frequency output scaling	10 Hz = 1 gph
Fuel Temperature	
Fuel temperature range	-17.7 to 85°C (0 to 185°F)
Fuel temperature accuracy	0.5°C (1°F) providing fuel has been flowing through burn rate meter long enough to stabilize the reading
Power Supply	
DC	11 to 32 Volts DC at 10 amp maximum
Horsepower Range	
Horsepower	11.3 Kw (15.2 hp) — 735 Kw (1000 hp)
Optional Alternating Current	
179-0713 AC Power Supply	100 to 240 Volts AC, 47 to 63 Hz at 1.6 Amps input Provides 24 Volts DC, 3.0 Amps output
Low Filter Response Times	
Flow change from 11.4 Lph (3 gph) to 121.3 Lph (32 gph)	6 seconds
Flow change from 121.3 Lph (32 gph) to 11.4 Lph (3 gph)	21 seconds
High Filter Response Times	
Flow change from 11.4 Lph (3 gph) to 121.3 Lph (32 gph)	4 seconds
Flow change from 121.3 Lph (32 gph) to 11.4 Lph (3 gph)	6 seconds
Weight and Overall Size	
179-0700	17.7 kg (39 lbs)—320 x 298 x 130 mm (12.6 x 11.8 x 5.1 in) includes filter
179-0701	3.2 kg (7 lbs)—260 x 160 x 90 mm (10.3 x 6.3 x 3.5 in)
179-0705	9.5 kg (21 lbs)—660 x 394 x 109 mm (26.0 x 15.5 x 4.3 in)

NOTICE
Do not use the Burn Rate Meter System for 3500 Engines. Restriction created by burn rate meter will cause return fuel to overheat, resulting in engine damage.

NOTICE
The meter should be upright, with the carrying handle on top when being operated. The meter can be tipped 30 degrees from an upright position and still work properly.

Paving Products

4C-5558 Auto Vibration Bypass Control

SMCS Code: 6606-036
Model: CB434, CB534 Vibratory Compactors
Warranty: One Year

- Allows vibration mode to operate while machine is standing still for testing and adjusting
- Without this tool machine has to be in motion for vibration mode to operate
- Consists of ON/OFF switch attached to 10-foot long cable

Reference

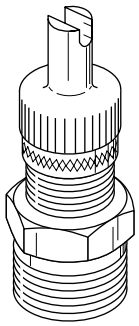
KENR1305 Service Manual

178-3832 Tank Valve

SMCS Code: 4200
Essential Tool
Model: PS-150B, PS-200B, PS-360B Pneumatic Compactors

- Used to check and set high and low pressure regulator settings for air-on-the-run systems
- Used with 3B-7764 Reducing Bushing
- Must be used to set high/low pressures after replacing pressure regulator switch
- Easily connects to air-on-the-run tank
- Equipped with standard valve core and sealing cap

Thread	1/4 NPT
Maximum pressure rating	1378 kPa (200 PSI)
Overall length	38 mm (1.5 in)
Material	brass



Reference

KENR2721 Service Manual; Supplement for PS-150B, PS-200B, PS-360B Pneumatic Compactors Air-on-the-Run System

Test Harnesses

SMCS Code: 0740, 0779
Model: E(L)200B, E(L)240B, and E(L)300B Excavators
Warranty: One Year (4C-8758, 990049 and 990050)

- Allows access to electrical control signals to be checked for correct operation and measurement of voltages, current, resistance and continuity

Reference

SENR4527, Testing and Adjusting module for E(L)200B
SENR4843, Electronic Power Unit module for E(L)240B
SENR4871, Electronic Power Unit module for E(L)300B
NEHS0546 Tool Operating Manual adjustment to electronic power unit control system

Item	Part No.	Description	Use
1	990048	Extension Harness	In electronic control circuit
2	990049	Test Harness	To check governor control potentiometer
3	990050	Test Harness	To check the Proportional Reducing Valve (PRV) on E(L)200B Excavator
Not shown	4C-8758	Test Harness	To check the PRV on E(L)240B and E(L)300B

Infrared Thermometers

SMCS Code: 0776-082
Model: All
Warranty: One Year

Part No.	Description
164-3310	Infrared Thermometer (Standard, Battery Power Only)
164-3320	Infrared Thermometer (Enhanced, 110 VAC) or Battery
166-9030	Infrared Thermometer (Enhanced, 220 VAC) or Battery

- Has 16-point laser circle spot (know exactly what area is covered) not available on former 123-6700
- Used to measure temperature (without contact) in hard to reach places, around moving machinery, or without stopping production
- Measures component temperatures on engine, transmission, power train, hydraulic, electrical, and mechanical systems, axles, and bearings
- Measure equipment, electrical panel, circuit breaker, generator, and gearbox temperatures in production plants; piece part temperatures in manufacturing facilities; or component and system temperatures in field applications
- Monitor temperatures in commercial applications such as supply and return registers, air stratification, and duct leakage; monitor temperatures of gasoline and diesel engine cylinders; check food preparation and storage temperatures
- Small light-weight units—extremely portable

164-3310

- Replaces discontinued 123-6700 Thermometer II
- Unit is lower priced
- Designed with adjustable emissivity, audible/visible high alarm, maximum/minimum temperature, and bar graph display
- Battery powered only (x 2 AA Cells)

164-3320

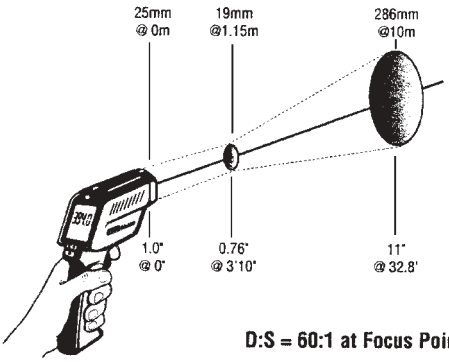
- Designed with easily adjustable emissivity, on-board emissivity table, 16-point laser circle spot (know exactly what area is covered), audible/visible high alarm, audible/visible low alarm, maximum/minimum temperature, DIF and AVG temperature, bar graph display, RS232 data output port, 100 point data logging, Windows-compatible Data Graphing Software, and 110 VAC power supply
- Hand held thermistor probe included
- Can be powered by battery or AC power access

166-9030

- Can be powered by battery or AC power access
- This unit is 220 VAC version of the 164-3320.

Graphic Display

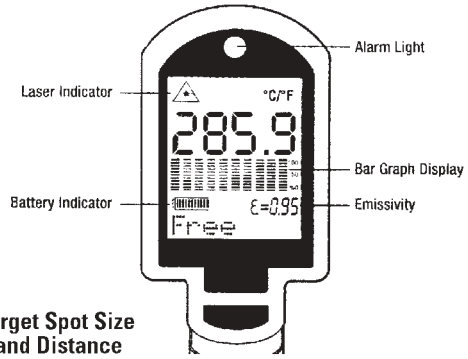
- Allows more information to be displayed at a glance
- Automatically creates a graphic display of last 10 temperature points measured using maximum and minimum temperature values to establish range



D:S = 60:1 at Focus Point

Laser Targeting Feature

- Laser targeting accuracy is greatly increased (60:1 ratio of distance versus spot size as compared to former 50:1 ratio).
- Increased accuracy when several heat sources are present (16 percent smaller target spot over former spot size at same distance)
- Factory aligned laser circle accurately pinpoints target, even when viewed at different angles.
- Compact, solid-state laser is mounted inside thermometer and is manufactured for rugged use.
- Laser targeting can be turned off when not required.

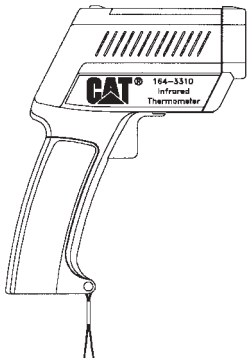


Target Spot Size and Distance

Target Specifications

Temperature measurements can be taken at any distance as long as the target size is larger than the target spot. The chart measures target distance in meters (feet) and spot size in millimeters (inches). If the target distance is greater than 3 meters (10 ft), divide the target distance by 24 to figure the spot size.

Target Distance mm (ft)	Former 50:1 Spot Size mm (in)	New 60:1 Spot Size mm(in)
0.3 (1)	20 (.8)	20 (.8)
0.6 (2)	20 (.8)	20 (.8)
0.9 (3)	23 (.9)	20 (.8)
1.2 (4)	25 (1.0)	20 (.8)
1.5 (5)	30 (1.2)	25 (1.0)
1.8 (6)	38 (1.5)	30 (1.2)
2.1 (7)	43 (1.7)	36 (1.4)
2.4 (8)	51 (2.0)	41 (1.6)
2.7 (9)	58 (2.3)	46 (1.8)
3.0 (10)	69 (2.7)	51 (2.0)



Temperature reading range	-30 to 900°C (-25 to 1600°F)
Accuracy	±1% of reading or ±1°C (±2°F), whichever is greater
Repeatability	±0.5% of reading or ±1°C (±2°F), whichever is greater
Response time	(95%) 250 mSec
Spectral response	8 to 14 um, thermopile detector
Display resolution	tenth degree reading up to 900°C (.2 to 999.8°F)
Ambient operating range	0 to 50°C (32 to 120°F)
Relative humidity	10 to 95% RH noncondensing @ up to 30°C (86°F)
Storage temperature	-20 to 50°C (-4 to 120°F) without battery
Power source	two 1.5 volt alkaline batteries
Power	direct current
Operating time without laser	25 hours
Operating time with laser	10 hours
Tripod mount	1/4-20 UNC
Dimensions	200 mm x 170 mm x 50 mm (7.9 in x 6.7 in x 2 in)
Weight	480 g (1 lb. 6 oz)

131-5050 DataView Group
131-5051 DataView Portable TechStation Group

SMCS Code: 1000-038, 3000-038, 4000-038, 5000-038, 6000-038, 0788
Model: All Models
Warranty: One Year

CE Compliant

- PC-based diagnostic tool that accepts up to nine standard Caterpillar sensors for measurements on any engine or machine—data is displayed on a personal computer (PC)
- Includes Data Logger using 2 Mbyte PC Memory Card for storage. Data Logger has Auto Triggering and Pre-Trigger information settings.
- Measures pressure, temperature, blowby, position, RPM, Hz, duty cycle (PWM), hydraulic flow, and fuel flow
- DataView hardware unit connects to standard PC parallel (printer) port. DataView software program runs on PC using Microsoft Windows™.
- Allows many current hand-held diagnostic tools to be replaced with a single diagnostic unit.
- Includes digital and analog measurements, bar graphs, charts, and histograms in real time or Data Logged data
- Can provide test/diagnostic data for test facilities such as dynamometer rooms, transmission test centers, or any other application where diagnostic measurements are required.
- Future versions of DataView software will interface with other programs such as SIS and ET via Service Technician Workbench (STW).
- Six "Analog" inputs for measuring any combination of pressure, temperature, blowby, and position
- Three "Frequency" inputs for measuring RPM, Hz, duty cycle (PWM), hydraulic flow, and fuel flow
- Two "Engine Set Point" inputs
- Calculated channels for displaying sum, difference, and hydraulic horsepower
- Automatic sensor identification of "Analog" sensors for automatic set-up using Auto ID cables (optional)
- RS232 input connector for 146-4080 Digital Multimeter (DMM)
- Portable TechStation carrying case holds DataView and a portable PC.
- Internal battery operates for up to eight hours.
- Operates and charges on 110/220 VAC, 11 to 40 VDC, or 12V Automotive Cigarette Lighter

Minimum PC Requirements	
Connection to PC	standard parallel (printer) port
Computer	IBM PC compatible with 486, 33 Mhz SL or SXL processor or greater
RAM	8 Mb
Available hard disc space	10 Mb
Diskette drive (internal or external add-on)	3.5 Inch, 1.44 Mb
Monitor	VGA
DOS version	5.0 or greater
Operating system	Microsoft Windows™ version 3.1 or Windows 95, OS2 version 2.11, or Warp 3.0
Printer port	parallel
General Hardware Specifications	
Internal power source	rechargeable internal nickel metal hydride battery (Varta C526F, 7.2 Volt 2400 mAh)
AC external power	131-5052 AC Power Adapter, 90 to 264 VAC, 47 to 63 Hz
External power connector	11 to 40 VDC machine power or cigarette lighter adapter
Power consumption	2 amp max at 15 VDC
Low battery indicator	flashing ON light
Battery life	10 hours nominal (dependent upon sensors being used)
Battery charge time	6 hours
Battery charge indicator	light off - not charging, light on solid - fast charge, light flashing - trickle charge
Operating temperature	-17 to +60°C (0 to 140°F)
Storage temperature	-40 to +100°C (-40 to +212°F)
Size	297 x 229 x 45.7 mm (1.7 x 9.0 x 1.8 in)
Weight	DataView hardware (enclosure only) 1.8 kg (4 lbs)
Data Logger Specifications	
Channels	data can be logged from all nine input channels
Memory	2 Mbyte PC PCMCIA flash memory card is standard
Sample rate	adjustable up to 1000 samples per second
Recording time	varies depending on sample rate and number of channels in use
Maximum log size	At first release of software, logs will be limited to 8000 samples. A later software version will provide larger size logs.
Pre-trigger	allows logging of events which happen before the log trigger point
Auto trigger	logging can be triggered from an event or change in any channel
Manual trigger	logging can be manually started from the PC or from the hardware

209-5545 Oxygen Analyzer

SMCS Code:0781,1088
Warranty:Manufacturer's

CE Compliant

- Battery operated—will operate more than 4 hours on 4 AA-size alkaline batteries
- Can be operated from AC power with optional power supply
- Measures oxygen content and temperature of exhaust gases of natural gas, diesel, oil, and propane powered engines
- Updates quickly to easily track adjustments
- Magnet-backed case provides ease of mounting

Part No.	Description
	Oxygen Analyzer
1U-7538	AA Non-rechargeable Alkaline Batteries
209-5551	Protective Rubber Boot with magnetic back
209-5552	Gas Probe/Hose Assembly
	Reference Guide
	Calibration Information
	Instruction Manual
6V-7145	Carrying Case
209-5574	Foam Insert
Service Parts	
209-5554	Particle Filter (10 per pack)
209-5555	Oxygen Sensor
Optional Parts (order separately)	
209-5556	Environmental Case (for instrument)
209-5558	Power Supply (120 VAC)
209-5560	Power Supply (240 VAC)
209-5561	In-line Water/Particulate Trap (for high water content)
209-5563	Replacement Filter for 209-5561 Water/Particulate Trap

Temperature	
Measurement range	-40 to 600°C (-40 to +1112°F)
Accuracy	±0.5°C (0 to +99.9°C) ±0.5% (from +100°C)
Resolution	0.1°C
Sensor	Thermocouple Type K (NiCr-Ni) to DIN IEC 584 Part 2, Class 1
Draft/Pressure Measurement	
Measurement range	±40 mbar (±0.6 PSI)
Resolution	0.01 mbar
Accuracy	0.03 mbar
Maximum overload	1000 mbar (14.5 PSI)
Gross/ Net Efficiency	
Measurement range	0 to 100 %
Resolution	0.1 %
Oxygen Measurement	
Measurement range	0 to 21 volume %
Accuracy	±0.2 volume %
Resolution	0.01 volume %
Carbon Dioxide Measurement	
Display range	0 to CO_2 maximum
Accuracy	±0.2 volume %
Resolution	0.01 volume percent
Measurement	Digital calculation from O_2
General Technical Data	
Power supply	AA-size batteries (4), rechargeable AA-size batteries (4), or power supply

206-2933 ProLink Printer (220 VAC / 12 VDC)

SMCS Code: 1900-036, 0779
Model: On-Highway Trucks
Warranty: Manufacturer's

- Used to print active diagnostic codes, logged fault event codes, data lists, trip recorder, customer specified parameters, engine rating specifications, snap shot data, and maintenance data
- Provides printed copy for permanent history folder
- Helps troubleshoot intermittent engine problems (allows comparison between properly running engine and an engine with problems)

Power source input	220 VAC
Power output to printer	12 VDC

Repair Information

NEXIQ Technologies
6839 Caminito Sueno
Carlsbad, CA 92009

Phone: 800-639-6774
Fax: 810-731-3348

Reference

STG00-15 Manual

205-8335 Monitor Extension Cable

SMCS Code: 1901-038, 0781
Model: 320C Excavator
Warranty: One Year

- Used to connect in-cab system monitor to a remote monitor
- Provides ground-level system monitoring to instructors and training students

Accessories for 4C-3030 Vibration Analyzer Group

SMCS Code: 0781, 0783
Model: All Models
Warranty: One Year

4C-3032 Accelerometer

- Useful for higher frequency measurements where acceleration units are needed
- Response is flat between 6 and 6000 Hz (±5%, 3-10000 Hz).

Model	Wilcoxon Research Model 762S
Weight	80 grams
Dimensions	43.2 x 21.6 dia. (1.7 x .85 in.)
Sensitivity	10 mV/G
Frequency response	±5% 3.0-10000 Hz, ±10% 2.0-12000 Hz, ±3 dB 1.0-15000 Hz
Temperature range	-50 - 120°C
Attachment	1/4-28 thread

9U-6955 Adapter, Charger to Analyzer

- Used with 4C-3030 Vibration Analyzer Group to prevent damage to 4C-3031 Analyzer batteries caused by overcharging
- Connects standard 4C-3033, 9U-5606 and 9U-5605 Battery Chargers and 4C-3031 Vibration Analyzer

9U-5606 Battery Charger

- Same as 9U-5605 except it is for 220-240 VAC
- Has U.S. 110-120 VAC household-type plug

4C-9023 Volts Adapter

- Used with 4C-3031 Vibration Analyzer to perform frequency analysis of any voltage signal (±10 Volts)
- Used to calibrate 4C-3031 Analyzer (signal generator required for calibration)

9U-5616 Adapter Cable

- Permits charging spare 4C-6729 Battery Pack outside of 4C-3031 Analyzer

9U-5836 Adapter Cable

- Permits connecting 4C-3031 Analyzer to battery charger while using speed pickup

163-0097 Spare Battery

SMCS Code: 0785

- For discontinued 163-0096 Process Calibrator

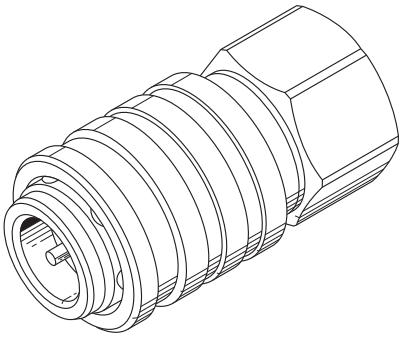
210-5530 S·O·S Quick Disconnect Coupler Assembly

SMCS Code: 5050-036
Model: All
Warranty: One Year

- Used only with 183-7264 and 183-8652 Dual Purpose S·O·S Sampling Valves
- Used to quickly take samples for testing
- 210-5530 valve is specifically designed for use with portable particle analyzers
- Easily snaps onto S·O·S sampling valves for continuous oil flow sampling

NOTICE

Using discontinued 170-8505 Quick Disconnect Coupler will cause damage to 183-7264 and 183-8652 S·O·S Sampling Valves. Only use new 210-5530 Quick Disconnect Coupler on these valves. Using the 210-5530 with the following valves will cause leakage: 8C-3446, 8C-3345, and 7X-3387.



Operating pressure	41397 kPa (6000 PSI)
Burst pressure	165517 kPa (24000 PSI)
Maximum operating temperature	104°C (220°F)
Seal material	nitrile/buna

R-12 and R-134a Portable Refrigerant Recovery Systems

SMCS Code: 7820
Warranty: Manufacturer's

- 208-1337 replaces discontinued 9U-6078; 208-1338 replaces discontinued 9U-7939
- Quickly recover contaminated, known, or unknown refrigerants including mixtures and blends
- Perfect for scavenger work or to protect recover/recycle equipment and valuable refrigerant supply
- Pump straight liquid refrigerant at up to 4 lbs/minute; vapor at 1 lb/minute
- Very durable (oil-less compressor, direct drive, and permanently lubricated cylinder walls)
- Reliable and lightweight
- Built-in 200 mesh inlet filter to protect from dirty air conditioning systems
- Easy use (two hose setup and on-the-fly auto purge)
- A 16 piece, 208-1386 Compressor Rebuild Kit is available for both units

Recovery capabilities	vapor and liquid applications
Compressor	1/2 HP reciprocating, oil-less
Size	25 x 44 x 35 cm (9.7 x 17.2 x 14.0 in)
Refrigerant types	R-12 and R-134a
Voltage	115V 60 Hz, single phase
Recovery rate (liquid)	1.8 kg (4 lbs) per minute (maximum)
Recovery rate (vapor)	0.5 kg (1 lbs) per minute (maximum)
Weight	22 kg (48 lbs)

Part No.	Description
208-1337	R-12 Recovery System
208-1328	Yellow R-12 Charging Hose
208-1360	Refrigerant Cylinder (30 lb)
208-1389	Retention Valve
208-1338	R-134a Recovery
208-1331	Yellow R-134a Charging Hose

Additional Parts for 208-1337

Part No.	Description	
208-1362	Refrigerant Cylinder (50 lb)	
208-1322	R-12 Charging Hose, Red	457 cm (15 ft)
208-1325	R-12 Charging Hose, Blue	457 cm (15 ft)
208-1327	R-12 Charging Hose, Yellow	457 cm (15 ft)
208-1329	R-12 Charging Hose, Blue	244 cm (8 ft)
208-1330	R-12 Charging Hose, Red	244 cm (8 ft)
208-1386	Compressor Rebuild Kit	

Additional Parts for 208-1338

Part No.	Description	
208-1362	Refrigerant Cylinder	
208-1332	R-134a Charging Hose, Blue	244 cm (8 ft)
208-1333	R-134a Charging Hose, Red	244 cm (8 ft)
208-1334	R-134a Charging Hose, Yellow	457 cm (15 ft)
208-1335	R-134a Charging Hose, Blue	457 cm (15 ft)
208-1336	R-134a Charging Hose, Red	457 cm (15 ft)
208-1386	Compressor Rebuild Kit	

197-1915 Air Conditioning Service Group

Warranty: Manufacturer's

CE Compliant

- Used to recover and recycle refrigerant from a vehicle's air conditioning system
- Works with any non-explosive refrigerant such as R12, R134a, R22, R502

General Features

- Portable—ideally suited for mobile field use
- Complete air conditioning server—provides an "all-in-one" package
- Rugged construction
- Easily connects to air conditioning system using self-sealing, snap connectors

Filling and Recovery

- Set predetermined evacuation time and refill quantity
- Evacuates all air and moisture from air conditioning system
- Cleans oil and moisture from recovered fluid (exceeds SAE requirements)
- Uses either bottle pressure or internal pump to fill air conditioning system
- No fluid reservoir (uses bottled gas)
- Recharges air conditioning system with a defined quantity of refrigerant and oil
- Fast clean-up time allows rapid change over between refrigerant types

Operation

- Built-in gauges—one for bottle pressure and one for system pressure when emptying/filling
- Easy operation—computerized weighing scale displays operator prompts and filter life
- Manual air purge valve ensures environmental contamination is minimized
- Computer controlled weighing scale provides operator with a semi-automatic air conditioning service tool

Standards

- Conforms to TUV, and TUV-GS standards

Supply voltage	230 VAC 50/60 Hz
Power consumption	205 watts
Scale discrimination	10 g
Dynamic filling correction accuracy	±10 g
Refrigerant tank	from gas supplier
Refrigerant pump rate	10 kg/h liquid at 20°C
Vacuum pump rate	142 L/h free air
Dimensions (D x W x H)	26 x 47 x 25 cm (10.2 x 18.5 x 9.8 in)
Weight of unit	22 kg (48.5 lbs)

Service Parts

Part No.	Description	Size
197-1920	Red Service Hose	1/2 inch x 14 mm, 3 m (10 ft)
197-1922	Yellow Service Hose	1/2 inch x 14 mm, 3 m (10 ft)
197-1921	Blue Service Hose	1/2 inch x 14 mm, 3 m (10 ft)
197-1919	Blue Hose Adapter, R12	6 inch
197-1918	Red Hose Adapter, R12	6 inch
197-1917	Filter	
197-1924	Oil Coupling, R12	
197-1923	Oil Coupling, R134a	

Repair Information

Crypton Technology
Bristol Road
Bridgewater, Sommerset, TA6 4BX England

Phone: 44 (0) 1278 436200 phone
Fax: 44 (0) 1278 450567

Belt Tension Gauges

SMCS Code: 7461-036, 1357-036
Model: All

- Used to check tension of belts driving components such as air compressor, air conditioning compressor, alternator, water pump, or other belt-driven attachments
- Increased accuracy is provided by a belt thickness compensating feature
- Has a permanent dial decal
- Eliminates belt slippage
- 144-0235 Belt Tension Gauge works on "A" section belts with top width of 9.0 to 13.0 mm (.37 to .50 in) and "K" section poly-v, 4, 5, and 6 rib belts
- 240-8220 Belt Tension Gauge works on section belts with top width of 9.7 to 31.8 mm (.38 to 1.25 in) and "K" section poly-v, and 8 rib belts

	144-0235	240-8220
Overall size	102 x 203 mm (4.0 x 8.0 in)	102 x 203 mm (4.0 x 8.0 in)
Leg span	82.6 mm (3.25 in)	—
Weight	400 g (14 oz)	.57 kg (1.25 lbs)
Accuracy	± 10%	± 5%
Range	130 to 800 N (30 to 180 lbs)	445 to 890 N (100 to 200 lbs)

199-6268 Differential Pressure Gauge
199-9817 Carrying Case Group

Essential Tool

- Used to measure low air pressure and/or non-corrosive gas pressure
- Frictionless magnahelic movement
- Positive, negative (vacuum), and differential readings
- No manometer fluid to evaporate or freeze
- Does not have to be level to provide accurate readings
- Used with 199-9817 Carrying Case Group which includes carrying case, mounting bracket, and 3 m (9 ft) of 3/16 inch ID rubber tubing

Cab Pressurization Testing

- Used to measure cab pressurization standards
- Minimizes dust and noise in cab by making sure a positive pressure of 0.2 to 0.6 inches of water is maintained
- Helps air conditioning system to operate at maximum efficiency

Tips for Obtaining Accurate Pressurization Readings

- Route gauge pickup tube under door seal into cab
- Do not crush pickup tube between door seal and cab frame
- Make sure pickup tube is completely sealed (if door seal collapses it can cause air leaks)
- If complete seal cannot be achieved, replace door seal
- Insert pickup tube in approximate area of operator's head and chest

199-6268 Differential Pressure Gauge	
Vacuum range	0 to 1 inch of water
High and low-pressure connections	1/8 NPT
Accuracy	±2% of full scale

208-1350 Fin Comb

SMCS Code: 7820
Warranty: Manufacturer's

- 208-1350 replaces discontinued 8T-9275
- Multi-head tools straightens 8, 9, 10, 12, 14, and 15 fins per inch
- Works on radiator evaporator coils and aluminum finned heat exchangers
- Breaks down easily for tool box storage
- Compact 10 cm (4 in) length

9U-6063 Dust Cover

Warranty: Manufacturer's

- Fits all cart-style units, Smart Cart and manual charging stations (will not fit 208-1316 or 154-4617)
- Protects your recovery/recycling equipment
- Made of top quality heavy-duty vinyl
- Seams are corded for extra durability
- Medium gray color

208-1350 Radiator Fin Comb

SMCS Code: 1353-023
Model: Multiple Engine Models

- Multi-head tool which handles 8, 9, 10, 12, 14, and 15 fins/inch
- Breaks down easily for tool box storage

212-8144 Socket

SMCS Code: 1372-012
Model: 3304, 3306

- Used to loosen and tighten radiator drain valve on 3304 and 3306 Engines
- 1/2 inch drive

9U-6737 Radiator Test Kit

SMCS Code: 1350-081
Model: 3176, 3306, and 3406 Engines
Warranty: One Year

- Low cost kit for testing radiators for excessive gases (Gas buildup leads to costly fluid discharge and overheating problems.)
- Simple, quick test to identify problems early that require more detailed diagnosis
- Plastic bottle is graduated and marked for easy reading

Reference

NEHS0581 Special Instruction

2S-9528 Blade Reversing Tool

SMCS Code: 1356-025
Model: Multiple Engine Models

- Used to change fan blade pitch on machines equipped with reversible fan blades

5P-3518 Fan Pulley Spanner Wrench

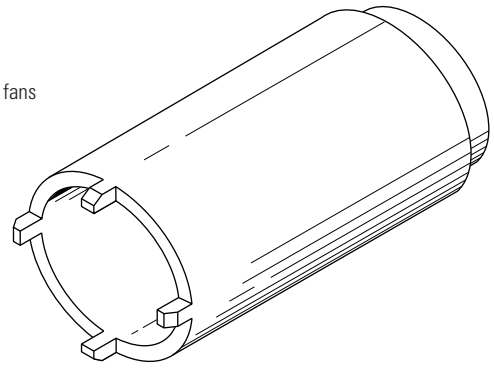
SMCS Code: 1359-025
Model: 3208
Warranty: Lifetime

- Used with a 9S-7353 Torque Wrench to tighten fan pulley nut on 3208 Engines equipped with a fan drive

243-6532 Spanner Wrench Assembly

SMCS Code: 1359-025
Model: C-9 Engines in Timber King Feller Buncher

- Used to disassemble and assemble Flexxaire engine fans
- Used with 1/2 inch square drive ratchet



Square drive	1/2 inch
Number of teeth	4, equally spaced
Tooth width	6.1 mm (24 in)
Inside diameter	64.0 mm (2.5 in)
Outside diameter	76.2 mm (3 in)

Crankshaft Seal and Wear Sleeve Installation Tools
CURRENT ENGINES

Location	(1) Locator	(2) Installer	(3) (4) Other Parts	(5) Nut	(6) Bolts	Qty	Distorter	Distorter Ring/Adapter
Rear	9S-8871	5P-7298	—	9S-8858	9S-8890	3	5P-7312	5P-7313
3300 Engines — Hydrodynamic Seals — SMHS8508								
Rear Gear Train	9S-8871	6V-7876	—	9S-8858	2P-1956	3	5P-7312	5P-7313
Not Oiled								
Rear Gear Train	9S-8871	6V-7877	—	9S-8858	2P-1956	3	5P-7312	5P-7313
Oiled								
Rear Train Oiled	9S-8871	1U-8585	—	9S-8858	2P-1956	3	5P-7312	5P-7313
Double lip 7C-4297 and 7E-6159								
Front 9Y-9895	—	4C-8982	—	—	7F-8022	1	5P-7312	5P-7315
3114 and 3116 Engines — Hydrodynamic Seals — SMHS8508, SEHS8868								
Front Wear Sleeve Installer: 5P-6208 Wear Sleeve: 171-7212		1U-7430						
Rear	—	1U-7594	1U-7597	9S-8858	1U-7596	2	5P-7312	4C-4869
3114, 3116 and 3126 HEUI Engines — Hydrodynamic Seals — SMHS8508								
Front Wear Sleeve Installer: 5P-6208 Wear Sleeve: 171-7212		1U-7430						
Rear	132-8772	1U-7594	1U-7597	9S-8858	1U-7596	2	5P-7312	4C-4869
3176, 3196, C-10 and C-12								
Front Wear Sleeve Installer: 145-5247 Wear Sleeve: 9Y-0821								
Rear Wear Sleeve Installer: 147-2675 Wear Sleeve: 9Y-0810								
3196 Rear Gear Train			FT2712 (Qty 3)		FT2711 (Qty 2)	2		
3400 Engines — Silcon Seals — SMHS7100								
Front	5P-1733	6V-2086	—	9S-8858	5P-1737	3	5P-7312	5P-7314
Rear	5P-1733	6V-2087	—	9S-8858	5P-1737	3	5P-7312	5P-7314
Rear Gear Train	5P-7301	6V-2087	—	9S-8858	5P-7309 5P-7310	2	5P-7312	5P-7314
3400 Engines — Hydrodynamic Seals — SMHS8508								
Front	5P-1733	6V-6142	—	9S-8858	5P-1737	3	5P-7312	5P-7314
Rear	5P-1733	6V-6143	—	9S-8858	5P-1737	3	5P-7312	5P-7314
Rear (Gear Train)	5P-7301	8T-2683	—	9S-8858	5P-7309 5P-7310	2	5P-7312	5P-7314
Rear (Brake Saver)	5P-3594	8T-2855	8T-2856	9S-8858	1T-0720	2	5P-7409	5P-7314
3500 Engines — Hydrodynamic Seals — SMHS8508								
Front and Rear	6V-4003	6V-4977	6V-4001	9S-8858	2N-5006	2	5P-7409	6V-3143
(With Adapter Group)			6V-4002					
1W-6975 and 1W-6978				1D-4716		4		
Front and Rear (without adapter group)	6V-4003	8T-3099	—	9S-8858	2N-5006	2	5P-7409	1U-7325
3524B Rear of Rear Engine Only	192-6339	187-1841	5P-8249	9S-8858 2J-3505		1 4	5P-7409	1U-7325
C27/C32 Engines — Hydrodynamic Seals — SMHS8508								
Front	5P-1733	6V-6142	—	9S-8858	9S-8858	3	5P-7312	5P-7314
Rear								
Small Pilot Crank Gear	5P-1733	6V-6143	—	9S-8858	9S-8858	3	5P-7312	5P-7314
Large Pilot Crank Gear	249-2937	6V-6143	—	9S-8858	9S-8858	3	5P-7312	5P-7314

6V-3044 Polishing Belt

SMCS Code: 1200-080
Model: Caterpillar Engines

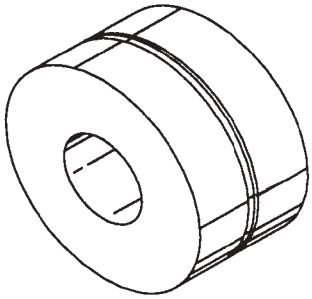
- Used on high speed electric or air-powered polishing machine to polish bearing journals on all Caterpillar crankshafts

Reference

SEBF8042 Guideline for Reusable Parts

4C-9765 Standard Centering Ring
4C-9766 Oversized Centering Ring

SMCS Code: 1224-064, 0672
Model: 3114/3116 Engines



Typical Centering Ring

- Used to precision machine main bearing bores in cap and cylinder block (available for standard and oversize bearings)
- Used with 1P-4000 Line Boring Tool Group (two centering rings required for machining procedure)
- Each ring stamped with size of main bearing bore
- Diameter:
  4C-9765: 95.00 mm (3.740 inch)
  4C-9766: 95.50 mm (3.760 inch)

Reference

REGO0867 and SMHS7606 Special Instruction

Cylinder Block and Liners

9U-6274 Compression Test Kit

SMCS Code: 1000-082, 0770
Model: 3046, 3054, 3056, 3064, and 3066 Engines

- Used to obtain compression pressure for comparision with other cylinders
- Gauge holds reading until released by bleed-off valve
- Flexible hose provides easy viewing angle of pressure gauge
- Air connectors also used to put shop air into combustion chamber while replacing valve springs
- Dual scales on gauge — PSI and kPa
- Pressure range: 0-7000 kPa (0-1000 PSI)

Item	Part No.	Description
1	9U-6279	Carrying Case
2	9U-6277	Pressure Gauge
3	9U-6389	Tee Fitting
4	9U-6387	Bleed Valve
5	9U-6275	Quick Coupler
6	9U-6280	Air Connector
7	9U-6384	Hose Assembly
8	9U-6145	Air Connector
9	9U-6390	Bushing
10	9U-6276	Quick Coupler
11	9U-6391	Quick Coupler
12	5C-0249	Plug Cap
13	9U-6394	Plug Cap
14	9U-6393	Check Valve
15	7D-2746	Elbow
16	9U-6392	Quick Coupler
Not shown		NEEG2538 Decal
Not shown	9U-6385	Foam Block

Tools for Repairing Cylinder Liner Lower Bores in the Cylinder Block

SMCS Code: 1223-005
Model: Multiple Engine Models

- Cylinder liner lower bores in cylinder block sometimes are damaged by erosion or pitting; blocks can be salvaged by installing sleeve in lower bore
- In bores with large gouges or severe erosion, voids can be filled with liquid metal before sleeve is installed
- Instructions are furnished; chart lists additional tools required

Engine Cylinder Block	Adapter Group[1]	Cutter	Chamfer Cutter	Cutter Length mm (inch)	Bushing Sleeve
D315: 4.5 in	PT-3100-001	PT-3100-009	PT-3100-006	42,9 (1.69)	PT-8300
D330: 4.5 in	PT-3100-001	PT-3100-009	PT-3100-006	42,9 (1.69)	PT-8305
D330: 4.75 in	PT-3100-002	PT-3100-009	PT-3100-006	42,9 (1.69)	PT-8310
D330: 5.4 in	PT-3100-003	PT-3100-010	PT-3100-007	50,8 (2.0)	PT-8315
3400 Series: 5.4 in	PT-3100-003	PT-3100-010	PT-3100-007	50,8 (2.0)	PT-8320
3400 Series: 5.75 in	PT-3100-004	PT-3100-011	PT-3100-008[1]	60,5 (2.38)	PT-8325
6 Cyl: 6.25 in	PT-3100-005	PT-3100-011	PT-2100-008	60,5 (2.38)	PT-8330
V-Eng: 6.25 in	PT-3100-005	PT-3100-011	PT-3100-008	60,5 (2.38)	PT-8335

[1] Adapter Groups consist of guide plate, drive plate, alignment ring, chamfering gauge, cutters (two), and chamfer cutters (two). The bushings (sleeves) must be ordered separately.

5P-6512 Valve Lifter Guide Bore Sleeving Tool Group

SMCS Code: 1112-005
Model: Multiple Engine Models

- Used to restore damaged valve lifter guide bores in cylinder blocks on D342, D339
- Valve lifter guide bore quickly restored in the shop by reboring block and installing finished 5P-6513 Sleeve

Item	Part No.	Description
1	4B-9820 7B-7640 6B-7225	Wrench Wrench Wrench
2	8L-2779	Seal
3	5P-6511	Carbide Cutter
4	5M-2894	Washer
5	0S-1588	Bolt
6	4D-3704	Washer

Reference

SMHS6982 Special Instruction

SEBF8029 Index for Salvage Parts, 3400 Family Engines bores

SEBF8069 Guideline for Reuseable Parts, procedure using jig mill

6V-7840 Deck Checking Tool Assembly

SMCS Code: 1216-082
Model: 518

- Provides very accurate measurements, which are compared to block specifications, to determine how much of top surface of cylinder block has been machined (When an engine is reconditioned, it is important to know if top deck has been previously machined.)

Service Parts	
Part No.	Description
4B-9820	Wrench
7B-7640	Wrench
6B-7225	Wrench

Reference

SEHS8187 Special Instruction

9U-6220 Stop Collar

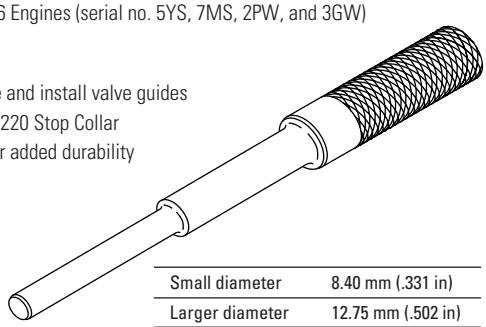
SMCS Code: 1104-012, 0703
Model: 3054 and 3056 Engines (all SN's)

- Used to install valve guides to proper height of 15.10 mm (.594 in)
- Used with 1U-9169 Guide Driver (7ZK, 6FK, 7AK, 1 ML)
- Used with 157-3722 Guide Driver (5YS, 7MS, 2PW, 3GW)
- Zinc coated to prevent corrosion

157-3722 Valve Guide Driver

SMCS Code: 0703, 1104-010, 012
Model: 3054, 3056 Engines (serial no. 5YS, 7MS, 2PW, and 3GW)

- Used to remove and install valve guides
- Used with 9U-6220 Stop Collar
- Heat-treated for added durability

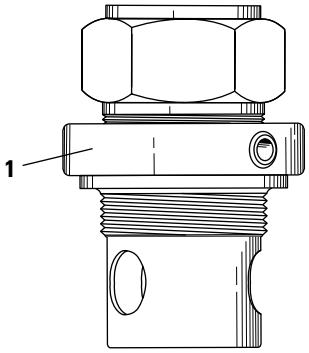


Small diameter	8.40 mm (.331 in)
Larger diameter	12.75 mm (.502 in)
Overall diameter	19.05 mm (.750 in)
Overall length	233.5 mm (9.19 in)

Puller Fingers for 7H-1970 Puller Group

Discontinued — Service Parts Available

Item	Part No.	Description
1		Puller Finger
	7H-1981	Puller Finger for medium head assembly
	7H-1987	Puller Finger for large head assembly



6V-7770 Valve Guide Tool Kit
6V-7755 Spring Seat Guide

SMCS Code: 1104-012
Model: 1100, 3100, 3200

- Used for installing valve guide sleeves in cylinder heads
- Used with 6V-3095 Boring Fixture and 6V-3108 Boring Fixture Kit
- Valve guides in cylinder heads of 1100, 3100 and 3200 Family Engines not replaceable; when valve guide wears beyond 9,55 mm (.3760 in) diameter "Use Again" dimension, guide must be reconditioned or complete cylinder head replaced
- 6V-7770 Tool Kit and 6V-7755 Adapter provide tools necessary to bore worn valve guides for installation of 4W-3778 and 4W-3779 Valve Guide Sleeves; tool kit includes driver to install valve guide sleeves and two reamers to size inside diameter of valve guide sleeves to correct dimension

Reference

SMHS82770-01 Special Instruction

Item	Part No.	Description
1	6V-7770	Valve Guide Kit
Service Parts in 6V-7770 Kit		
	5P-5176	Brush
	5P-5173	Reamer, 9,47 (.373 in)
	5P-5174	Reamer, 9,50 (.374 in)
	6V-7153	Line Up Bushing
	6V-7154	Drill Bushing
	6V-7155	Core Drill|
	6V-7156	Reamer, 12,7 (.5 in)
	6V-7157	Driver
	6V-7158	Pin
	9U-5987	Oil, 1/2 pint (not shown)
2	6V-7755	Spring Seat Guide

1U-6685 Guide and Insert Tool Group

SMCS Code: 1250-010
Model: 3114, 3116

- Required for disassembly, assembly, and adjusting of 1.1 liter engine, fuel system, and governor
- Used for valve guide and valve seat removal and installation

Reference

SENR3582, Specification Module

SENR3583, System Operation Testing and Adjusting

SENR3611, Disassembly and Assembly Manual

Part No.	Description
1U-7791	Valve Seat Driver
1U-7792	Guide Collar
1U-7793	Guide Driver
1U-7794	Shaft Assembly
1U-7795	Holding Block
1U-7796	Exhaust Extractor
1U-7797	Inlet Extractor
1U-7798	Slide Hammer
1U-8211	Lid Filler Block
6V-7145	Case

4C-6371 Valve Seat Driver, Inlet
4C-6372 Valve Seat Driver, Exhaust

SMCS Code: 1103-012, 0703
Model: 3046 Diesel Engine

- Used to install valve seats
- Serves as a guide to properly align seat during installation — saves time and reduces chance of damage
- Knurled handle for better handling

Reference
SENR6458 Special Instruction, Disassembly and Assembly of 3046 Engine

9S-3080 Valve Seat Insert Puller Group
Discontinued — Service Parts Available

Item	Part No.	Description
1	9S-3081	Extractor
	9S-3082	Extractor
	9S-3084	Extractor
	9S-3085	Extractor
	9S-3086	Extractor
	9S-3087	Extractor
	9S-3088	Extractor
	9S-3089	Extractor
	9S-3090	Extractor
2	9S-3095	Handle Assembly
3	9S-3097	Shaft (part of 9S-3095)

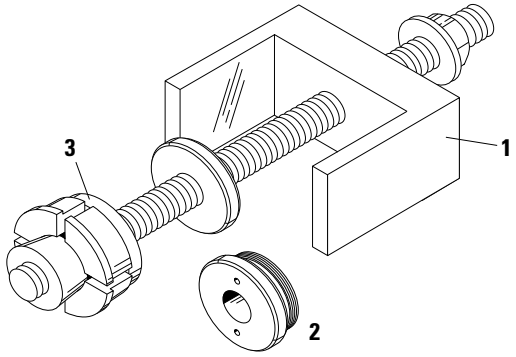
Reference
GMG02114 Special Instruction

130-1449 Valve Seat Puller Group

SMCS Code: 1063-036
Model: All 3600 and G3600 Engines

- Replaces discontinued 9U-5099 Valve Seat Puller Group
- Used to remove intake and exhaust valve seat inserts
- Used with 6V-3160 Hydraulic Cylinder for faster, safer removal
- A 9U-5098 Threaded Insert, part of 130-1449, can be used to adapt 6V-7047 Hydraulic Cylinder
- Overall length: 337 mm (13.3 in)
- Overall width: 140 mm (5.5 in)

Reference
SENR3594 Disassembly and Assembly, 3612 and 3616 Engines



Item	Part No.	Description
1	130-1449	Valve Seat Puller Group
2	9U-9058	Threaded Insert
3	157-2882	Expander Segment Set (serviced separately)

Sleeve Replacement Tools

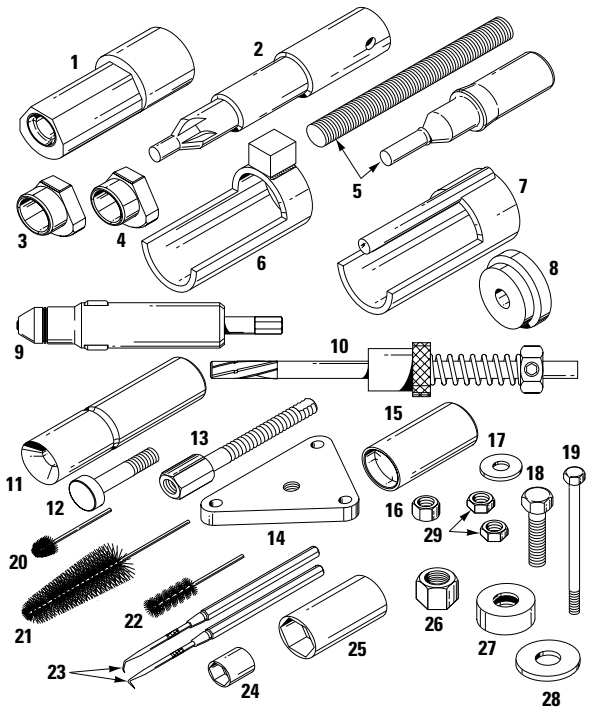
SMCS Code: 1125-011, 0703
Model: 3114, 3116 and 3126 Engines

- 143-2099 Sleeve Replacement Tool Group replaces the former 127-3458 Sleeve Replacement Tool Group
- The former 127-3458 Sleeve Replacement Tool Group can be UPDATED to the new configuration simply by purchasing the 143-2098 Sleeve Removal Tool Group. Previous tooling not listed below is no longer needed for the new procedures.
- These new improved tools are simpler and make the job faster and easier—offering the following benefits over the former 127-3458 Tool Group:

  - No tapping of old sleeves—means less debris, no stripped threads and no problem with loose sleeves turning

  - Works in low-overhead applications, such as cylinders #5 and #6 in GM truck chassis, Cat machine installations, and others

  - Should be no need to remove the cylinder head from the engine for sleeve replacement
- Used on engines equipped with Mechanical Unit Injectors (MUI) or Hydraulic Actuated Electronically Controlled Unit Injectors (HEUI).
- Engines produced since early 1994 have had injector sleeves roller expanded at the factory. The original 4C-4462 Tool Group will not pull these sleeves; either the 127-3458 or the 143-2099 Tool Group is required.
- All special tooling necessary to efficiently remove, install, and ream copper injector sleeves is included in a single custom case in the 143-2099 Group. Some additional shop supplies are also required, as specified in the Tool Operating Manual NEHS0675.

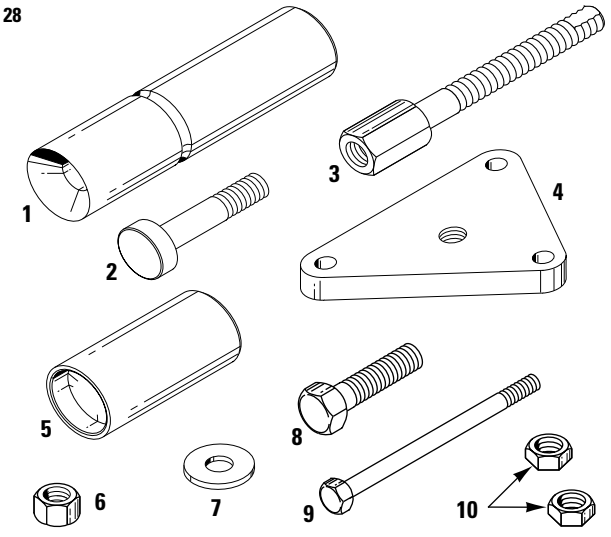


143-2099 Sleeve Replacement Tool Group

Item	Part No.	Description
1	125-7060	Driver
2		Reamer Assembly
	4C-8713	Shank
	4C-5564	Reamer Head
	4C-5502	Setscrew
3	4C-8714	Guide Bushing (large)
4	4C-8715	Guide Bushing (small)
5	Swage Assembly[1]	
	4C-5573	Swage (sleeve)
	4C-5548	Stud (3/4-10 thd x 5 1/2 in)
6	125-7059	Reaction Sleeve (HEUI)
7	9U-5671	Reaction Sleeve (MUI)
8	4C-5572	Plate (for reaction sleeve)
9	121-2920	Roller Expander
10	9U-6101	Reamer Group
11	142-8278	Swage Tool[2]
12	142-8279	Sleeve Puller[2]
13	142-8280	Sleeve Stud[2]
14	142-8281	Plate[2]
15	143-8612	Driver[2]
16	3L-2415	Full Nut[2], 1/2-13
17	7D-1649	Hard Washer[2]
18	3L-2415	Hex Bolt[2] [1/2-20, 63.5 mm (2.5 in) long]
19	6V-3821	Hex Bolt[2] [M8 x 1.25, 110 mm (4.3 in) long]
20	4C-5553	Sleeve Cleaning Brush (tapered)
21	126-3297	Large Bore Brush
22	4C-5570	Small Bore Brush
23	9U-6859	Pick Set
24	214-6625	Socket (11 mm, 3/8 in square drive, six point)
25	213-3530	Socket (1 1/8)
26	2J-3506	Nut (3/4-10 thd)
27	1U-8826	Thrust Bearing
28	2S-0115	Hard Washer
29	1B-4430	Jam Nut, 1/2-20
Not shown		
	6V-7145	Case
	125-0684	Foam Insert
		NEEG2748 Decal
		NEHS0675 Tool Operating Manual, "Using the 143-2099 Sleeve Replacement Tool Group on 3114, 3116 and 3126 Engines"

[1] Not shown

[2] Parts in the 143-2098 Sleeve Removal Tool Group



143-2098 Sleeve Removal Tool Group

Item	Part No.	Description
1	142-8278	Swage Tool
2	142-8279	Sleeve Puller
3	142-8280	Sleeve Stud
4	142-8281	Plate
5	143-8612	Driver
6	3L-2415	Full Nut, 1/2-13
7	7D-1649	Hard Washer
8	3L-2415	Hex Bolt, 1/2-20, 63.5 mm (2.5 in) long
9	6V-3821	Hex Bolt, M8 x 1.25, 110 mm (4.3 in) long
10	1B-4430	Jam Nut, 1/2-20
Not shown		
		NEEG2748 Decal
		NEHS0675 Tool Operating Manual, "Using the 143-2099 Sleeve Replacement Tool Group on 3114, 3116 and 3126 Engines"

6V-7028 Spring Seat Enlarger

SMCS Code: 1101-023
Model: All Caterpillar Engines

- Used to machine larger spring seat diameter on 9N-1107 Cylinder Heads; larger spring seat necessary to install large diameter valve springs and spacers
- Must be used with 1/2 inch electric drill (500-700 rpm)

Reference

SEHS8131 Special Instruction

227-4397 Socket, 1-1/8 inch

SMCS Code: 1101-010
Model: 3406
Warranty: Lifetime

- Allows mechanic to perform proper engine head service safely and efficiently on 3406 Engines equipped with Jake Brakes
- Used to remove, install and torque extended-length head bolts
- 1-1/8 inch deep well, thin wall impact
- 3/4 inch drive, 6 point
- Industrial finish

4C-6373 Valve Seal Installer

SMCS Code: 1104-012, 0703
Model: 3046 Diesel Engine

- Used to install valve seal — easily installed using hand force
- Prevents damage to valve seal during installation — saves time and reduces cost
- Knurled for ease of handling

Reference

SENR6458 Special Instruction, Disassembly and Assembly of 3046 Engine

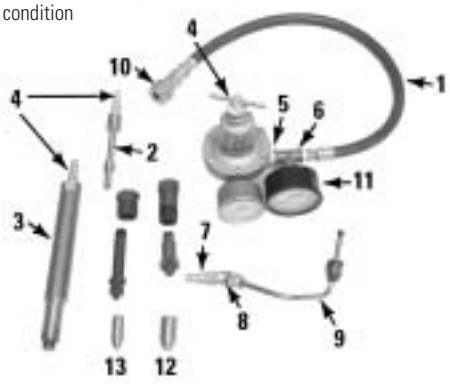
Cylinder Condition Analysis Tools

SMCS Code: 1100-023
Model: All Models

- Used to analyze cylinder condition on any Caterpillar engine
- Pressurized air is introduced into cylinder; amount of pressure drop is indicator of piston ring and valve condition

Reference

GMG00694 Special Instruction



Item	Part No.	Descriptionn
1	6K-5875	Hose Assembly
2	1P-5564	Adapter (D.I. Engines)
3	1P-5565	Adapter (Gas Engines)
4		Norgren Regulator Model #11-002-049
5	3B-7767	Nipple (Modify nipple by filling with braze and drilling a 1,02 mm (.040 inch) orifice hole through braze.)
6	3B-7762	Tee
7	6V-4142	Nipple
8	9S-7341	Fitting (1/4 inch tube-1/8 inch pipe)
9	8S-2268	Tube Assembly
10	6V-4143 7S-8897	Coupling Assembly Seal (Part of 7S-8895)
11	8T-0846	Gauge
12	1P-5569	Tip
13	1P-5567	Tip
Not shown	5K-5068	Nipple (two)

9U-7995 Head Guide Pin

SMCS Code: 1100-012, 0703
Model: 3046 Diesel Engine

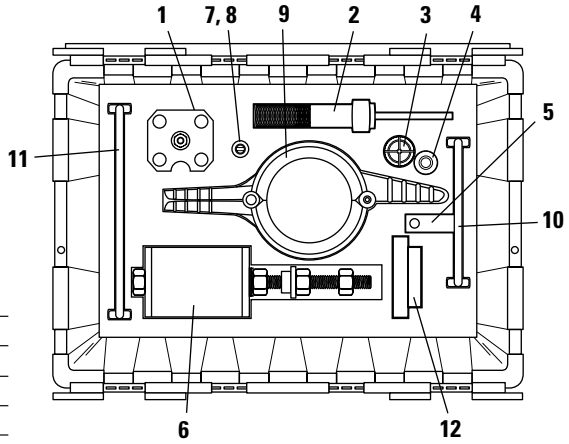
Reference

SENR6458 Special Instruction, Disassembly and Assembly of 3046 Engine

- Used to align cylinder head during engine assembly — two required
- Simple to use (threaded guide pin has screwdriver slot for easy installation)
- Thread: M12 x 1.75
- Overall length: 115 mm (4.5 inch)

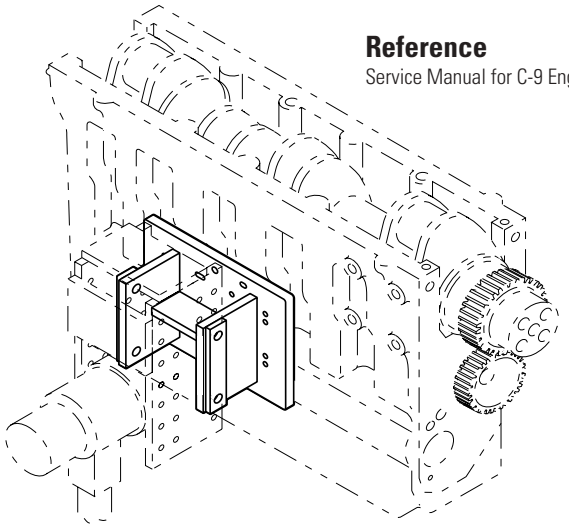
196-3165 Tool Kit, C-9 Engine
173-5533 Repair Stand Bracket

SMCS Code: 1000-017, 0701
Model: C-9 Engine



- 196-3165 Tool Kit used to overhaul C-9 Engines (contains all tools unique to this engine)
- 173-5533 Bracket securely attaches C-9 engine to repair stand — bolts to engine using breather assembly mounting holes
- Used with 173-5533 Repair Stand Bracket and 1U-5750 Engine Repair Stand
- Available as a kit or individual parts can be ordered separately

Engine Repair Stand with Adapter Bracket	
Part No.	**Description**
173-5526	Engine Stand Bracket
1U-5750	Engine Repair Stand



Reference

Service Manual for C-9 Engines

196-3165 C-9 Engine Tool Kit		
Item	**Part No.**	**Description**
1	176-5487	Valve Spring Compressor
2	173-5523	Valve Seat Installer
3	173-5525	Valve Seat Puller
4	173-5524	Driver Valve Guide
5	191-6077	Injector Installer Bracket
6	173-5527	Cylinder Liner Puller
7	136-4632	Spring Loaded Timing Pin
8	139-7064	Spring Loaded Timing Pin Adapter
9	173-5528	Piston Ring Compressor
10	143-9731	Turbocharger Wrench (122 mm reach)
11	143-9730	Turbocharger Wrench (30 mm reach)
12	1U-7430	Front Crank Seal Installer
13	196-5469	Foam Insert
14	196-5472	Storage Case
Not shown		NEEG2925 Decal

9U-7530 Tool Kit, 3406E Engine

SMCS Code: 1000-017, 1000-036, 0701
Model: 3406E, C-15, C-16

- Contains tools to remove and install camshaft and cam bearing, compress valve springs, install valve seals, valve seats, and valve guides, remove and install pendulum damper, adjust injector prestroke, remove and install injector sleeve, test and adjust adjustable idler gear, clean injector bores
- Also services cable connectors, and provides necessary electronic cables to test, adjust, and troubleshoot 3406E Engines
- Packaged in two plastic containers with foam inserts for ease of handling and storage (Plastic cases and foam inserts are not serviced under Cat part number; if these items are needed, contact Caterpillar Service Technology Group)
- Chart, packaged in each kit, identifies tool requirements by job and lists reference publication form numbers
- Total weight: 48 kg (105 lbs.)

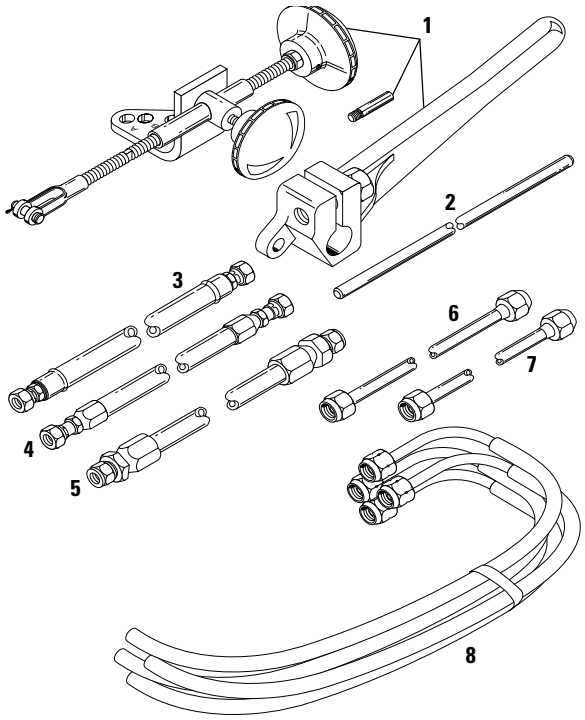
NOTE: Refer to part number in Tool Guide for individual features/benefits and picture of each tool listed.

Reference

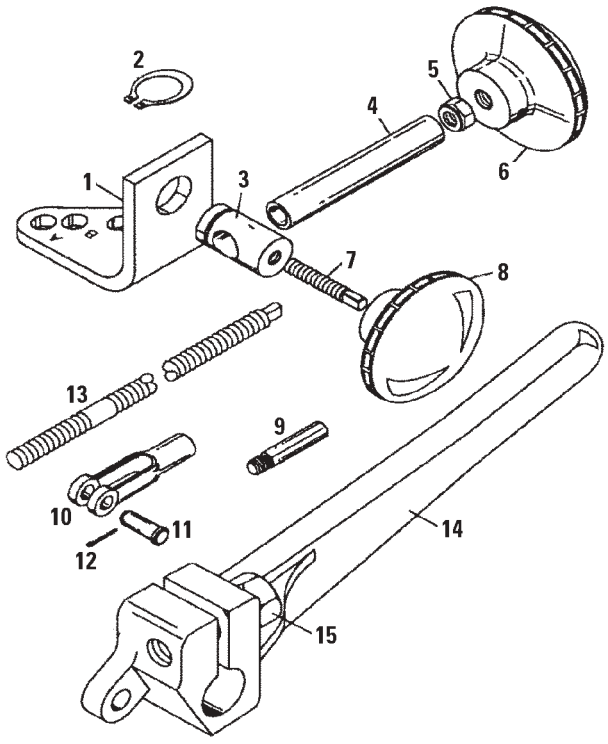
SENR5580 Service Manual

Service Parts	
Part No.	**Description**
9U-7256	Guide Assembly
9U-7240	Camshaft Lifting Hook (2 required)
9U-7257	Cradle Assembly
9U-7225	Camshaft Pilot (2 required)
9U-7243	Alignment Sleeve
9U-7210	Puller Plate
9U-7213	Backup Plate
9U-7214	Spacer Plate
9U-7222	Cam Bearing Pilot
9U-7223	Alignment Bushing
9U-7241	Valve Spring Compressor Group
9U-7226	Valve Seal Installer Group
9U-6898	Valve Seat Driver
9U-6897	Valve Seat Driver
9U-6895	Valve Seat Driver
9U-6894	Guide Collar
9U-6896	Guide Bolt

Service Parts	
Part No.	**Description**
9U-7227	Injector Height Gauge Assembly
9U-6891	Sleeve Tool Group
9U-7255	Adjustable Idler Assembly
9U-7324	Indicator Bracket
9U-6862	Small Tapered Brush
9U-6863	Small Bore Brush
9U-7244	End Brush,
9U-7237	Drill Extension
4C-5552	Large Bore Brush
7X-1715	Adapter Cable Assembly
7X-1403	Adapter Cable Assembly
7X-1686	Adapter Cable Assembly
7X-1695	Timing Probe Cable
175-3700	DT Service Kit
	NEEG2581 3406E Tooling Reference Chart



Lines and Testing Hardware			
Item	Part No.	Description	Quantity
1	1P-3520	Control Group	1
2	126-1827	Rod	1
3	7G-7105	Hose Assembly	3
4	3V-2744	Hose Assembly	1
5	031-2125	Hose Assembly	1
6	9U-5299	Fuel Line Assembly	12
7	9U-5298	Fuel Line Assembly	8
8	5P-6515	Lines Group	2



Additional Hardware (Dependent on Pump Model)		
Part No.	Description	Quantity
6V-7793	Coupling Group	1
4L-5937	Injection Pump Fuel Line Assembly	6
3P-1539	Injection Pump Fuel Line Assembly	8
1P-1795	Valve Group	8
1U-5223	Valve Fitting	6

Part No.	Where Used
6V-9132	adapter to bench rails (front)
7G-7105	#6 (37 degree) [9/16-18 thread x 965 mm (38.0 in) long]
4L-5937	1.60 mm (.063 in) ID x 431.8 mm (17.00 in) long
8N-5132	for master nozzle
1P-1795	original nozzle for injection pump test benches
1P-3520	governor shaft, rack adjustment
3P-1539	1.60 mm (.063 in ID x 533.4 mm (21.00 in) long
5P-6515	injection pump flushing lines
1T-0416	for master nozzle
1U-5223	bleed return for 1P-1795
9U-5298	1.83 mm (.072 inches) ID x 762 mm (30.0 in) long
9U-5299	1.83 mm (.072 inches) ID x 1270 mm (50.0 in) long
9U-6705	for master nozzle
3V-2744	#4 (37 degree) [7/16-20 thread x 610 mm (24.0 in) long]
6V-6103	fixture assembly to bench rails (long)
6V-7793	drive adapt Hartridge 20.00 mm (.787 in) jaw
6V-9133	adapter to bench rails (rear)
6V-9134	fixture assembly to bench rails (short)
6V-9138	fixture assembly to bench rails
031-2125	#4 (37 degree) [7/16-20 thread x 1016 mm (40.0 in) long]
126-1827	drive coupling rotation (CAT heavy duty)

Service Parts for 1P-3520 Control Group			
Item	Part No.	Description	Quantity
1	1P-3493	Bracket	1
2	2J-6356	Ring	1
3	1P-3487	Lug	1
4	1P-2335	Sleeve	1
5	1A-8285	Nut	1
6	1P-2333	Knob	2
7	1P-3492	Stud	1
8	1P-2333	Knob	2
9	1P-3486	Pin	1
10	1P-3494	Yoke	1
11	1P-3491	Pin	1
12	3B-4609	Pin	1
13	1P-3488	Stud	1
14	6D-4396	Lever	1
15	1A-2029	Bolt	2

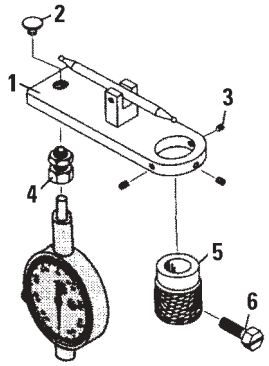
Reference

NEHS0593, 9U-7693 Lines Group (Hartridge Bench Upgrade)
NEHS0594, TMI Specification
NEHS0607, 9U-7840 Calibration Fluid Test Kit
NEHS0624, 4C-8192 Heavy Duty Coupling Group (Hartridge Bench UpGrade)
NEHS0625, Tool Operating Manual (3408/12, PEEC NSFS)
NEHS0631, FIETS General Maintenance and Trouble Shooting
NEHS0639, Tool Operating Manual (3406B and 3406C, PEEC NSFS)
NEHS0640, Tool Operating Manual (Calibration Fluid Suction Port)
SEHS7466, FITB Manual (Kent Moore Bench)
SEHS8024, 6V-6070 Governor Adjustment Tool Group
SEHS8200, FIETS Manual (Hartridge Bench)
SEHS9318, 3161 Woodward Test and Adjustment
SMHS7013, 5P-4203 SMFS Tool Group

Adjustment Tools			
Item	**Part No.**	**Description**	**Use**
1	8T-1001	Electronic Position Indicator	obtain measurement specifications
2	8T-1002	Indicator Probe	obtain measurement specifications
3	6V-3075	Indicator	obtain measurement specifications
4	5P-4163	Indicator Tip	obtain measurement specifications
5	4C-2982	Indicator Collet	as an assembly to measure plunger lift
6	4C-5713	Nozzle Overflow Assembly	allows mechanic to see when fuel stops flowing and then check timing angle
7	4C-5085	Wrench	adjusts the setting of torque idling screw
8	4C-5567	Torque Adjusting Socket	adjusts the setting of torque idling screw
9	4C-6509	Plunger Spring Retainer	replace adjustment shims (holds plunger spring off top of roller)
10	5P-1720	Seal Pick	replace adjustment shims (holds plunger spring off top of roller)
11	4C-6605	Tweezer	helps to remove and install delivery valve
12	9Y-6051	Locknut	as an assembly to measure plunger lift
13	4C-5604	Copper Washer (2)	as an assembly to measure plunger lift
14	4C-4658	J-tube Fitting	as an assembly to measure plunger lift
15	4C-4766	Plunger Adapter	as an assembly to measure plunger lift

Calibration Fluid and Lube Line Tooling			
Item	**Part No.**	**Description**	**Use**
1	127-4365	Fuel Line (6)	
2	4C-4909	Transfer Pump Cover	covers transfer pump opening during testing
3	4C-5708	Copper Washer (2)	returns test oil from pump back to test stand
4	4C-5707	Copper Washer (2)	supplies test oil to fuel pump
5	4C-5706	Copper Washer (2)	supplies lube oil to pump
6	4C-6609	Lube Oil Supply Fitting	supplies lube oil to pump
7	4C-5711	Calibration Fluid Supply Fitting	supplies test oil to fuel pump
8	4C-5710	Calibration Fluid Return Fitting	returns test oil from pump back to test stand

Indicator Tools			
Item	**Part No.**	**Description**	**Use**
1	8T-1001	Electronic Position Indicator	obtain rack measurement specifications
2	8T-1002	Indicator Probe	obtain rack measurement specifications
3	5P-4160	Indicator Tip (part of 6V-6042 Indicator Contact Point Group)	obtain rack measurement specifications
4	3P-1567	Indicator	obtain rack measurement specifications
5	4C-5569	Measurement Adapter1	attaches indicator to pump for rack measurement
6	4C-2982	Indicator Collet	attaches indicator to pump for rack measurement
7	146-7774	Nylon Screw	attaches indicator to pump for rack measurement



146-7780 Rack Position Bracket Group (not serviced)			
Serviced by			
Item	**Part No.**	**Description**	**Quantity**
1	146-7777	Arm Assembly[2]	1
2	6V-2057	Point[2, 3]	1
3	5B-9324	Set Screw[2]	3
4	3P-1565	Collet[2]	1
5	146-7771	Rack Measurement Adapter[2]	1
6	146-7774	Nylon Screw[2]	1
Not shown	6V-2030	Extension[2, 3]	1

[1] Used for FIETS with original coupling

[2] Used for FIETS and AVM with heavy duty coupling

[3] Part of 6V-6042 Indicator Contact Point Group

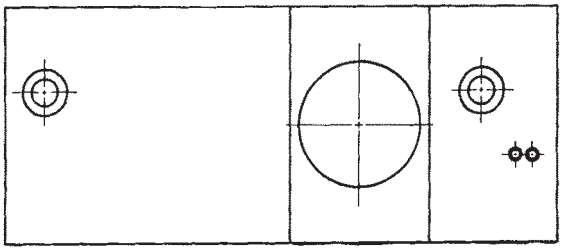
6V-4172 Injector Sleeve

SMCS Code: 1254-038, 1254-081
Model: D11N, 3508, 3512, 3516, 777B, 785, 789, 3500

- Used to cover fuel ports when cleaning injectors on D11N. 777B, 785, 789, and 3500 Series Engines

4C-9279 Plate

SMCS Code: 1290-016; 0706
Model: 3500 Family Engines



- Used to assemble unit injectors
- Provides means to position injector rack in injector body so plunger gear can be properly meshed with rack during injector assembly
- Allows injector spring replacement with minimal injector disassembly
- Designed for use with 6V-4830 Fixture Group but may be clamped in bench vise

Reference

SEHS9287 Special Instruction

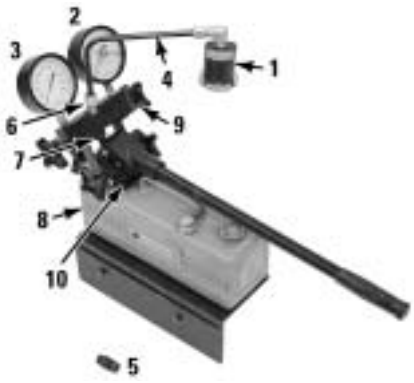
5P-4150 Nozzle Tester Group

SMCS Code: 1250-012, 1254-010, 1254-017, 1254-025, 1250-036, 1254-038, 1254-081
Model: 1100, 3100, 3208, 3400
Warranty: Manufacturer's

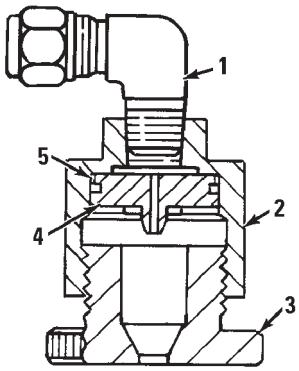
- Used to test all fuel nozzles, including pencil-type nozzles on 1100 and 3100 Series and 3208 Engines, direct injection capsule-type fuel nozzles on 3400 Series Engines, and capsule-type nozzles used on all other engines

Reference

SEHS7292 Special Instruction



Item	Part No	Description
1	5P-8744	Adapter Assembly (If desired, quick disconnect fittings may be installed for faster changing of nozzle adapters. Refer to Engine News of October 3, 1979, for installation instructions.)
2	8T-0859	Gauge 25000 kPa (3600 PSI)
3	8T-0856	Gauge 6000 kPa (870 PSI) SEHS7605 Caution Label (for 5P-4146)
4	5P-4721	Tube (End fittings not included; included with 5P-4719 and 5P-4720)
5	5P-4244	Adapter
6	5P-4719 8T-5313	Fitting (Includes connecting fitting for 5P-4721) Fitting
7	5P-4243	Fitting
8	8T-5313	Filter
9	4J-7533	Seal (one on each hand valve, qty. 5)
10	6V-0183	Gasket (between reservoir and pump)
Available separately (not shown)		
	1U-9578	Repair Kit



Service Parts for 5P-8744 Adapter Assembly		
Item	Part No	Description
1	5P-4720	Fitting (Includes connecting fitting for 5P-4721)
2	5P-8741	Adapter
3	5P-8740	Retainer
4	5P-8742	Piston Assembly
5	2S-4663	Seal

Tools for Rotating Crankshaft

SMCS Code: 1202-018, 0701
Model: 3114, 3116 and 3126 Engines

- Used to rotate crankshaft (makes setting valves and engine timing procedures easier)
- Used with 5P-7305 Engine Turning Gear and 1/2 inch square drive ratchet
- Fastens to starter mounting hole using starter mounting bolts
- Rotate gear shaft housing assembly until 5P-7305 Engine Turning Gear engages flywheel gear before tightening starter mounting bolts

Measure dimension "X" on starter housing to determine which part to use.		
Part No.	**Description**	**Size**
9U-6943	Shaft Housing Assembly	146 mm (5.75 in)
9U-7336	Shaft Housing Assembly	127 mm (5.00 in)
5P-7305	Engine Turning Gear	6/8 and 8/10 pitch

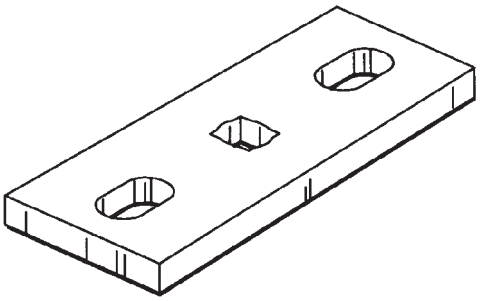
9U-6198 Crankshaft Turning Tool

SMCS Code: 1202-024, 0714
Model: 3054 and 3056 Engines

- Used to rotate crankshafts (connects directly to front of crankshafts)
- Has 1/2 inch drive in center to connect ratchet or breaker bar
- Dimensions: 50 x 140 mm (2.0 x 5.5 inch)

Reference

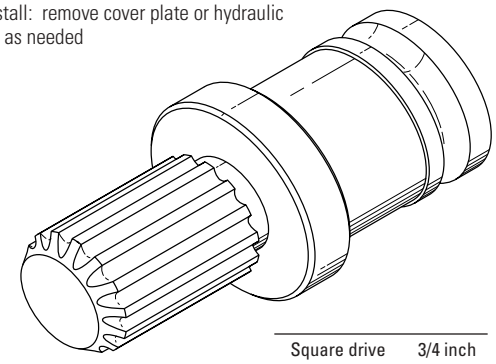
SENR5555 Service Manual



208-0888 Engine Turning Tool

SMCS Code: 1202-024, 0714
Model: 3176C and C-9 Engines
Essential Tool

- Used to turn crankshaft in engines with rear PTO flywheel housing (engages forward spline of upper PTO gear)
- Used in applications where no flywheel turning tool access is provided
- Heat-treated for added durability
- To install: remove cover plate or hydraulic pump as needed

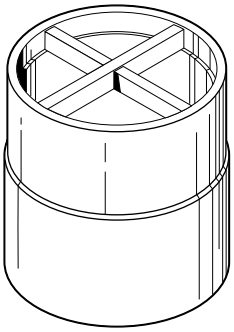


Square drive	3/4 inch
Spline	14 tooth

178-8615 Socket

SMCS Code: 1000-018, 0700, 0701
Model: 3114, 3116, 3126 MUI, HEUI, and 3126B Engines

- Used to turn engine crankshaft by hand
- Socket crossbars engage all four bolt heads in front pulley hub
- Prevents over-tightening or loosening of a single bolt when it used to turn crankshaft clockwise or counterclockwise
- Square drive: 3/4 inch
- Overall length: 90 mm (3.5 in)



5P-2682 Bleeder Valve Socket

SMCS Code: 3224-025
Model: 963, 973

- Replaces 9F-0022 Bleeder Wrench
- Used to loosen air bleeder valve on early forged body fuel pumps
- Fits various drive combinations when accessibility is a problem
- 1/4 inch square female and 1/2 inch hex male drive

8T-0833 Fuel Pump Wrench

SMCS Code: 3205-025
Model: 943, 953, 963, 973
Warranty: Lifetime

- Used for removal and installation of fuel pump on 3408 and 3412 Engines (replaces 6V-0094 Universal Joint in this application)

6V-7050 Compressor Group

SMCS Code: 1251-023
Model: 3406

- Used for servicing fuel pump plunger and barrel assemblies on 3406 Engines with New Scroll Fuel System
- Needed to compress heavier pump lifter springs on these engines when plunger and barrel assemblies are removed and installed

Reference

SMHS8278 Special Instruction

Item	Part No.	Description
1	2N-3476	Screw
2	6V-7015	Clamp Assembly
3	5M-7418	Nut
4	4B-1228	Screw
5	4B-2046	Nut
Not shown	148-5675	Case
Not shown	6V-7026	Block
Not shown	148-5677	Block

6V-4180 Off-Engine Lifter Setting Tool Group

SMCS Code: 1253-017, 1250-025, 1251-036
Model: All Engines with Forged Body or Compact Fuel Systems

- Replaces 5P-6600 Tool Group
- Includes lifter setting tools for all current engines, including 3400 Series Engines
- Also included are shaft assemblies which clamp positively to camshafts, eliminating movement between camshaft and degree wheel
- Tools required for individual engines are listed in the application chart below.
- Additional tools needed, but not included, with 6V-4180 Group are also illustrated.

Additional Tools Needed But Not Included in 6V-4180 Group		
Item	**Part No.**	**Description**
32	5P-6570	Shaft Assembly
33	8S-2272	Shaft Assembly
34	1B-3680	Bolt
35	3F-1417	Washer
36	6V-2012	Gauge Group
37	6V-7926	Indicator Group
38	9M-4567	Wrench
39	9M-4568	Wrench

6V-4180 Off-Engine Lifter Setting Tool Group		
Item	**Part No.**	**Description**
1	9S-6332	Box Assembly
	6V-4181	Tool Holder Block
	9S-8105	Liner

3P-2200 Sleeve Metering Calibration Tool Group

SMCS Code: 1250-025, 1251-082
Model: Caterpillar Engines

- Used for calibrating (similar to lifter setting) sleeve metering fuel pumps in shop
- Several tools from 5P-4203 Tool Group also needed for this operation
- Metric tools; values for testing and adjusting are given in metric terms, with exception of torque values and pressures

Reference

SMHS6988 Special Instruction

Item	Part No.	Description
1	7W-8120	Bushing
2	1P-7379	Microgauge
3	3P-1568	Indicator
4	6V-3186 6V-3185	Collet Base
5	5P-6510	Box Assembly
6	1S-9836	Wrench
7	3P-1546	Pin 15,9410
8	3P-1545	Pin 17,3734
9	3P-1540	Pump assembly
10	5P-6557	Spring (Part of 3P-1540)

Additional tools from 5P-4203 Tool Group required for pump calibration

Item	Part No.	Description
1	8S-2243	Wrench
2	5P-6602	Adapter
3	5P-4205	Wrench
4	5P-4206	Wrench
5	1D-4533	Bolt
6	1D-4538	Bolt
7	5P-4209	Gauge
8	8S-7271	Screw
9	2P-8264	Socket
10	6V-0190	Clamp (two)

5P-3516 Reaming Tool Group

SMCS Code: 1253-017
Model: 225B, 225B-3208, 229-3208, 3208, 613C

- Used to ream 5P-4810 Camshaft Bearing when front bearing requires replacement in sleeve metering fuel system pump housings

Reference

SMHS6735 Special Instruction

Item	Part No.	Description
1	5P-3515	Reamer
2	5P-3057	Fixture Assembly

6V-4164 Driver
6V-4163 Bit

SMCS Code: 1250-010
Model: Caterpillar Engines

- Capable of applying torque required to remove and install mounting bolts for later 8N-2663 Flyweight Carrier in sleeve metering fuel systems

Item	Part No.	Description
1	6V-4164	Driver, 1/4 inch Hex, 3/8 inch square drive
2	6V-4163	Bit, 1/4 inch and 1/8 inch hex

5P-6577 Fuel Setting Tool Group

SMCS Code: 1251-010, 1250-025, 1250-036
Model: Caterpillar Engines

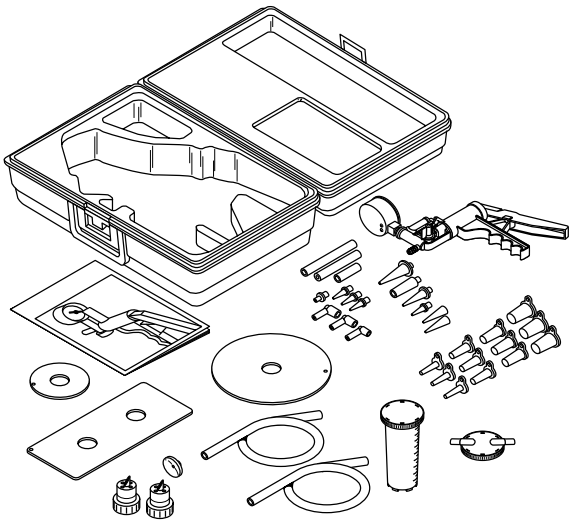
- Contains only those tools needed for checking and adjusting fuel setting on engines with Sleeve Metering Fuel Systems
- All tools in this group also contained in 5P-4203 Field Service Tool Group

Item	Part No.	Description
1	1D-4533	Bolt
2	1D-4538	Bolt
3	5P-4205	Wrench
4	3P-1544	Pin
5	3J-6956	Spring
6	5P-0299	Pin
7	5P-0298	Pin
8	5P-6602 3P-1565 3P-1567 8S-7271 5P-6531	Adapter Collet Indicator Setscrew Point (Part of 3P-1567)
9	5P-7319	Box

195-0761 Pressure/Vacuum Pump Group

SMCS Code: 4282-010
Model: 3000 Series Engines With Stanadyne Fuel Injection Pumps
Warranty: 5 year (see details)

- Used to check and adjust aneroid capsule
- Includes other accessories for general diagnostic, testing, and adjusting procedures requiring vacuum or pressure
- Compound pressure gauge
- Hand-operated, no external power required
- Includes compact carrying case



Maximum vacuum at sea level	-85 kPa (23 to 25 in Hg)
Single stroke volume	16.4 cu cm (1.0 cu in)
Maximum pressure unassisted	100 kPa (15 PSI)
Maximum pressure assisted	175 kPa (25 PSI)
Compound pressure gauge range	100 kPa (-30 mm Hg) to 200 kPa (30 PSI)
Vacuum gauge accuracy -85 kPa (15 to 30 in Hg)	3% of full range

Warranty Information

The pump is warranted to be free of all defects in material and workmanship for FIVE FULL YEARS from the date of original purchase. This warranty does not apply to any defects caused by negligence of the user, use of the product in any manner other than in accordance with the instructions provided with the product, or damage caused by accidents. It also does not apply to gauges, which are warranted for a period of 90 days from date of purchase.

A 196-2965 Repair Kit is available.

Repair Information

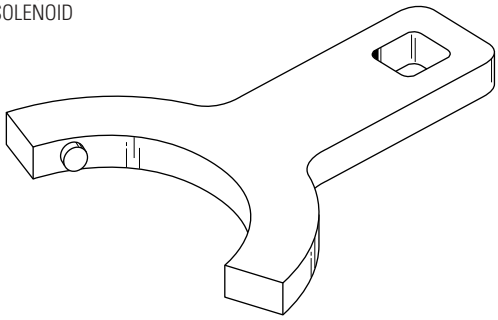
Prism Enterprises, Inc.
6952 Fairgrounds Parkway
San Antonio, TX 78238

Phone: (800) MITYVAC (648-9822)
(210) 520-8051
Fax: (210) 520-8039
Website: www.mityvac.com

159-0271 Solenoid Spanner Wrench

SMCS Code: 1278-016
Model: 3208 Engine with Air/Fuel Ratio Control Override Solenoids
Essential Tool

- Used to install solenoid
- Used with 3/8 inch drive torque wrench
- For installation only — DO NOT USE TO REMOVE SOLENOID



Square drive	3/8 inch
Solenoid torque specification	20 ± 5 N·m (15 ± 4 ft lb)
Torque wrench setting	16 ± 4 N·m (12 ± 3 ft lb)

6V-9052 Piston Seal Guide
6V-9072 Piston Seal Guide

SMCS Code: 1278-016, 1278-017
Model: D40D, D400D, 3406, 3406B

- Used to help install piston assembly in fuel ratio control body

1P-0087 Adjusting Wrench

SMCS Code: 1264-010
Model: Caterpillar Engines with Woodward PSG Governors

- Required for removal and installation of speeder spring in Woodward PSG governors whenever adjusting pilot valve plunger control position

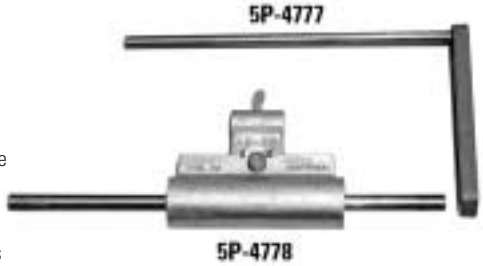
Locating Bushing	
Part No. New (Former)	**Connecting Rod Assembly Part No.**
5P-3543 (2H-8234)	5B-2058, 6F-4323, 6F-4325, FH5348
5P-3542 (2H-8235)	5B-1447, 5B-1456, 6F-1952, 6F-3276, 6F-4318, 6F-4319, 6F-4321, 9F-2326, 9F-2330, 4H-9733, 8H-5322, 7M-4835, 4S-6867
5P-3539 (2H-8236)	5B-1919, 6F-4324, 6F-4326
5P-3541 [1] (7M-6030)	8H-9354, 3K-6142, 9L-6016, 9L-8369, 9L-9326, 1M-1079, 4N-2218, 9N-8002, 5S-6360
5P-3544 [1] (1S-7999)	8F-9411, 3H-3109, 4L-3841, 4M-7573, 4M-9218, 7M-4923, 4N-0371, 4N-0390, 4N-4339, 1P-0009, 1S-4618, 3S-8285, 9S-8492, 8N-1728, 7N-3229
5P-3538 [1] (5S-9943)	9M-3980, 5S-2793
5P-3545 (7S-3102)	4N-4261, 4N-6018, 4N-9001, 4N-9002, 2P-2671, 1S-1862, 2S-1601, 9S-5455

[1] Later bushings have the tapered portion machined so that connecting rods with tapered pin bearings can be properly located.

Reference
SMHS6870 Special Instruction

5P-4777 Torsion Bracket
5P-4778 Feed Cylinder

SMCS Code: 1218-023
Model: Caterpillar Engines
Warranty: 5P-4777 Torsion Bar: G
5P-4778 Feed Cylinder: M



- Make up hydraulic feed mechanism needed for use with 5P-3550 Connecting Rod Boring Machine
- Can also be used on former 2H-6782 Boring Machines with or without 5P-2009 Rework Group

NOTE: Later bushings have tapered portion machined so connecting rods with tapered pin bearings can be properly located.

9U-5945 Rod Locating Group
9U-5948 Expanding Segment Group (1.1)

SMCS Code: 1219-024, 0672
Model: 3114 and 3116 Engines

- Aligns 3114 and 3116 connecting rods in 5P-3550 Connecting Rod Boring Machine prior to boring rod eye bushings
- 5P-3550 Connecting Rod Boring Machine is discontinued and not available from Caterpillar

9U-5948 Expanding Segment Group (1.1):
- Consists of three 50.8 mm (2 in) long segments of split collet and an O-ring (segments sold only as a group)
- Sold separately — not part of 9U-5945 Rod Locating Group

Item	Part No.	Description
1	9U-5948	Expanding Segment Group (consists of 3 segments and one 7T-0507 O-Ring)
9U-5945 Rod Locating Group includes:		
2	9U-5944	Expander Nut (2)
3	9U-5943	Bushing Locating Rod
4	9U-5946	Bushing
Not shown	9U-5947	Expander Cone

9U-5949 Expander Segments Group

SMCS Code: 1218-028, 0677
Model: 3500 Family Engines

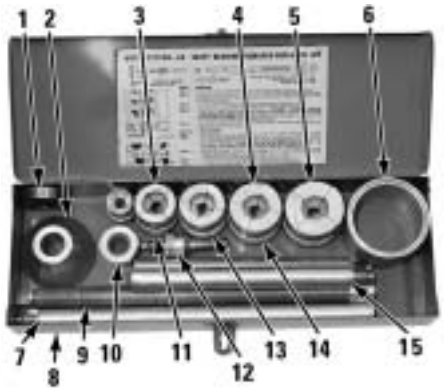
- Used when replacing bushing/bearing in connecting rod
- Insures proper alignment of rod before boring of rod eye bushing
- Used with 9U-5945 Rod Locating Group and discontinued 5P-3550 Connecting Rod Boring Machine
- Three 50.8 mm (2.0 in) long segments of a split collet and two O-rings
- Service Part: 0S-0768 O-Ring

8S-2241 Camshaft Bearing Installation and Removal Group

SMCS Code: 1211-010
Model: Caterpillar Engines

- Used to remove and install camshaft bearings in most Caterpillar Engines
- Each collet designed to handle bearing diameter range listed in chart; replacement O-ring seals used to retain collets also listed

Item	Part No.	Description
1	8S-8287	Thrust Bearing Assembly
2	8S-8288	Cone
3	8S-8282	Collet Assembly
4	8S-8284	Collet Assembly
5	8S-8285	Collet Assembly
6	8S-8289	Tube
7	8S-8293	Long Extension
8	8S-8281	Tool Box
9	8S-8291	Threaded Shaft
10	8S-8290	Nut
11	8S-8884	Backup Nut
12	8S-8286	Screw Expander
13	8S-8883	Backup Nut
14	8S-8882	Backup Nut
15	8S-8292	Short Extension (two)



Collet No.	Inner Diameter Size Range mm (inch)	Replacement O-Ring Seal
1P-0552	28,58 — 38,10 (1.125 — 1.500)	4J-0520
8S-8282	43,66 — 50,80 (1.718 — 2.000)	4J-0521
8S-8283	48,42 — 57,15 (1.906 — 2.250)	4J-0522
8S-8285	60,33 — 69,85 (2.375 — 2.750)	4J-0524

5P-1666 Puller Plate
5P-1667 Spacer Tube

SMCS Code: 1211-010, 1253-017, 1230-010, 3258-017
Model: D379B, D398B, D399, 657E

- Used with 8S-2241 Group for camshaft bearing removal and installation on 6.25 inch bore V Engines (two 8S-8292 Short Extensions and one 8S-8293 Long Extension required from 8S-2241 Group)

Item	Part No.	Description
1	5P-1666	Puller Plate
2	5P-1667	Spacer Tube
3	8S-8292	Short Extension (two required) (part of 8S-2241 Tool Group)
4	8S-8293	Long Extension (part of 8S-2241 Tool Group)

1P-5545 Adapter Group

SMCS Code: 1211-010, 1211-012
Model: 1100, 3100, 3208

- Used with 8S-2241 Tool Group to install camshaft bearings on 1100 and 3100 Series and 3208 Engines

Item	Part No.	Description
1	0S-0509	Bolt

6V-4869 Adapter
6V-6174 Plug

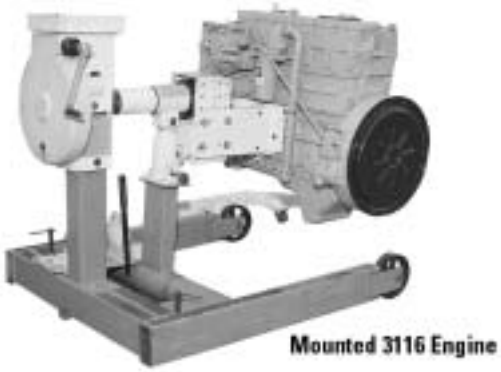
SMCS Code: 1211-010
Model: 3400

- Used with 8S-2241 Tool Group to remove and install camshaft bearings in 3400 Series Engines
- 6V-4869 Adapter used for collet assembly
- 6V-6174 Plug used for cone

1U-5750 Diesel Engine Repair Stand, 6000 lbs.

SMCS Code: 0630
Model: Engines within 6000 lbs.

- 1U-5750 includes universal engine adapter assembly which permits use of engine mounting adapters
- Integral, 12-ton jack raises work to provide swing radius needed to turn work
- Turning even a 3-ton diesel 360° is easy — a 96 to 1 ratio worm and gear set does the job easily
- Crank handle can be locked in any position
- 2 front wheels and 2 rear casters permit easy mobility; floor locks anchor 1U-5750 in place
- Required floor space: 48 inch W x 55.5 inch L
- Weight: 698 lbs.


Mounted 3116 Engine

Engine Adapter Plates for 1U-5750

- Order only adapters needed for engines being worked on; universal adapter assembly required for mounting all but John Deere adapters to stand
- Warranty: Manufacturer's

NOTE: Products are shipped F.O.B. Searcy, Arkansas. Each Engine mounting plate includes all the necessary hardware and an engine application chart.

Reference

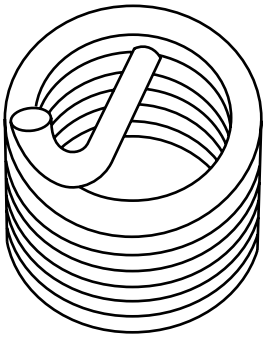
Tool Guide, Lifting, Blocking and Clamping Section

Item	Part No.	Description
1	1U-7517 [1]	For International Harvester engines; DT-466 in-line 6 cyl., DV-550, MV-404, MV-446, V304, V345, V392, 4-152, 4-196, 4-194, 9.0 liter V8 and the 6.9l (Ford). Wt., 62 lbs.
2	1U-7510 [1]	For Cummins engines: All NH, NTC and NTE 855 Series in-line 6 cyl; 378 Series V6; 504, 555 and 903 Series V8; KT 1150 Series in-line 6 cyl., L10. Wt., 41 lbs.
3	1U-7513 [1]	For Mack engines: V8 1000 and 1980 thru current 672 in-line 6 cyl. and 477 Scania series. Note: No. 206629 supersedes No. 205100. Wt., 32 lbs.
4	1U-5749 [1]	For Caterpillar engines; Nos. 1673, 1674, 1693, 3304, 3306 and 3406 in-line 6 cyl.; Nos. 1100 and 3208 V8; No. 3408 V8. Wt., 68 lbs.
5	1U-7511 [1]	For Mack engines: All 672, 673, 675 and 711 Series in-line 6 cyl. Wt., 49 lbs.
6	1U-7518 [1]	Allison transmission mounting plate, for use with 1750-A engine stand. Handles Allison transmission Nos. AT500, MT600, MT 6 speed, VH, VS and V730. Wt., 25 lbs.
7	1U-7508	Universal adapter plate assembly. Included with 1U-5750. (Must be used with all plates below except John Deere plates.) Wt., 114 lbs.
8	1U-7509 [1]	For Detroit engines: 53 Series in-line 6 cyl., 6V and 8V; 71 Series in-line 6 cyl., 6V, 8V and 12V; 92 Series 6V and 8V; 8.2 liter V-8. Wt., 58 lbs.
Not shown	9U-5161	For Caterpillar Engines: 1.1 and 1.7.

[1] Must be used with 1U-7508 Universal Adapter Plate Assembly

133-1531 Threaded Insert

SMCS Code: 1052-023, 0676
Model: 3600 Engines with Turbochargers
Warranty: Manufacturer's



- Used to repair stripped or damaged threads in turbocharger housings
- Used with 4C-9730 Tap and 8T-2793 Installation Tool
- Will withstand 540°C (1000°F) temperatures
- Thread specification: M10 x 1.5

4C-6713 Spark Ignited Combination Tool Group

SMCS Code: 1000-017, 1000-036, 0701
Model: 3600 Series Spark Ignited Engines

The 4C-6713 Spark Ignited Combination Tool Group consists of 9U-5105 Basic Tool Group and 9U-5107 Spark Ignited Tool Group. Both tool groups contain essential tools to test and adjust, remove and install, and disassemble and assemble components of the 3600 Spark Ignited Engine. The 9U-5105 Basic Tool Group can be used on either diesel or spark ignited 3600 Engines.

The 4C-6713 Spark Ignited Combination Tool Group contains tools to:

- Remove and install cylinder liner, piston, and connecting rod as an assembly
- Remove and install vibration damper
- Remove and install piston pin retainer (snap ring)
- Remove and install flywheel and rear gear assembly
- Remove and install crankshaft main bearings
- Remove and install camshaft bearings
- Remove and install cylinder head
- Remove and install piston rings
- Remove and install rear idler gears
- Install water pump seals
- Disassemble centrifugal oil filter
- Remove and install camshaft segment
- Drain fuel from fuel filter housing to remove filter element
- Drain oil and remove filter element from oil filter housings
- Protect crankshaft rod journal and align connecting rod assembly onto crankshaft during removal and installation of piston and rod assembly
- Remove and install spark plugs
- Rotate crankshaft
- Align piston pin during assembly of piston and connecting rod
- Check and adjust valves
- Provide lifting eye bolts and link brackets necessary to service 3600 Family Spark Ignited Engines
- Support piston and connecting rod assembly while removing and installing rod bearing (cylinder head installed)

9U-5107 Spark Ignited Tool Group	
Part No.	**Description**
1U-8869	Digital Dial Indicator
4C-4601	Spark Plug Socket
4C-6593	Adjusting Tool
4C-8568	Liner Puller Group
4C-8995	Ring Expander Group
4C-9043	Compressor Group
5P-4160	Contact Point
9U-5156	Cleaning Tool Group

Reference

SENR4255 Service Manual

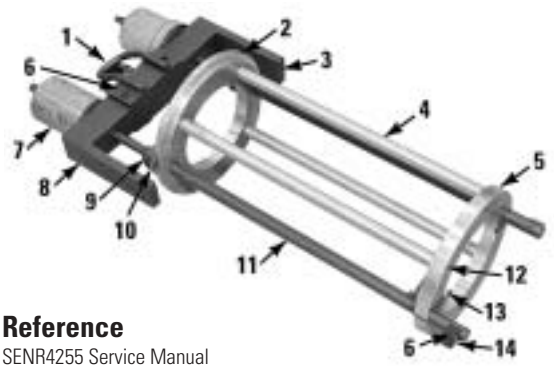
SENR5500 Service Manual

SEHS9599 Special Instructions

4C-8568 Liner Puller Group (part of 9U-5107 Group)

Model: 3600 Spark Ignited Engines
SMCS Code: 1216-010, 1000-017, 0701

- Used to easily remove 300 mm (11.8 in) cylinder liners from block using hydraulic pressure
- Used with 8T-3035 Lines Group, 8T-0820 Pressure Gauge, 3S-6224 Hydraulic Pump (115V 50/60 cycle), or 8S-8033 Hydraulic Pump (230V 50/60 cycle)
- Twenty-two tons of pulling force with two 5P-5247 Hydraulic Puller Assemblies (included)
- For ease of handling, hoist can be fastened to 4C-8568 Liner Puller Group



Reference

SENR4255 Service Manual

SENR5500 Service Manual

Item	Part No.	Description	Quantity
1	8T-2835	Lifting Bracket	
2	4C-8565	Top Ring	
3	6V-7078	Bridge Support	2
4	6V-7069	Rod Spacer	4
5	4C-8566	Bottom Ring	
6	2J-5245	Hex Socket Head Bolt	6
7	5P-5247	Hydraulic Puller Assembly	2
8	6V-7079	Bridge	

Item	Part No.	Description	Quantity
9	8T-2836	Nut	2
10	4B-5278	Washer	2
11	6V-7077	Puller Leg	2
12	4D-3120	Bolt	8
13	4H-6996	Spring Pin	8
14	6V-7076	Foot	2
Not shown	4B-5276	Washer	2
Not shown	1B-4331	Nut	2
Not shown	2K-6073	Bolt	4

9U-5106 Diesel Tool Group

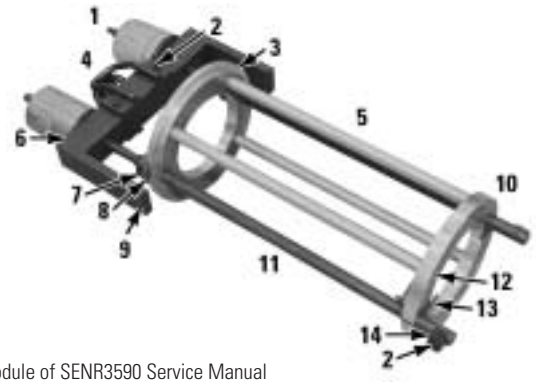
Model: 3600 Diesel Engines

Consist	
Part No.	**Description**
6V-7073	Liner Puller Group
8T-3033	Ring Expander Group
4C-6594	Timing Tool Group
1U-8795	Governor TorqueArm
8T-3268	Bolt (2)
4C-5719	Piston Ring Compression Group
9U-5932	Torque Extension
130-6993	Injector Bore Brush
5P-0328	Crowfoot Wrench, 7/8 inch (Fuel Line)
5P-0329	Crowfoot Wrench, 15/16 inch (Fuel Line)

6V-7073 Liner Puller Group (Part of 9U-5106 Group)

Model: 3600 Engines
SMCS Code: 1216-011, 0705

- Used to remove and install cylinder liner using hydraulic pressure (hoist attaches to puller to easily handle tool and cylinder liner)
- Hydraulic pump connects to two 5P-5247 Hydraulic Puller Assemblies for a combined pulling force of 195 kN
(22 ton)
- Used with 3S-6224 Hydraulic Pump (115 V) or 8S-8033 Hydraulic Pump (230 V); other required tooling is 8T-3035 Lines Group and 8T-0820 Pressure Gauge



Item	Part No.	Description
1	5P-5247	Hydraulic Puller Assembly (two required)
1U-7618 Hardware Group (includes the following parts)		
2	2J-5245	Bolt
3	6V-7074	Top Ring
4	8T-2835	Bracket
5	6V-7069	Spacer
6	6V-7079	Bridge
7	8T-2836	Nut
8	4B-5278	Washer
9	6V-7078	Support
10	6V-7075	Bottom Ring
11	6V-7077	Leg
12	4D-3120	Bolt
13	4H-6996	Pin
14	6V-7076	Foot
Not shown	1B-4331	Nut
Not shown	4B-5276	Bolt
Not shown	2K-6073	Bolt

Reference

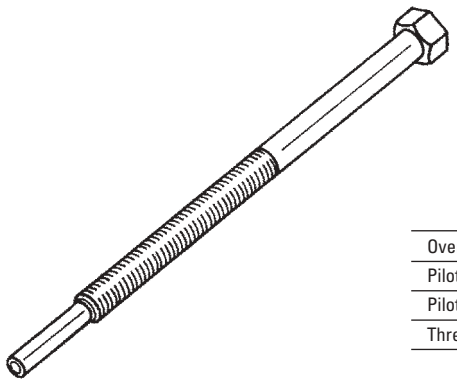
SENR3594 Service Manual Module of SENR3590 Service Manual

SENR3600 Service Manual Module of SENR3595 Service Manual

8T-3268 Bolt (Part of 9U-5106 Group)

Model: 3600 Engines
SMCS Code: 1290-011, 0706

- Used to remove unit injector by evenly tightening two bolts at the same time



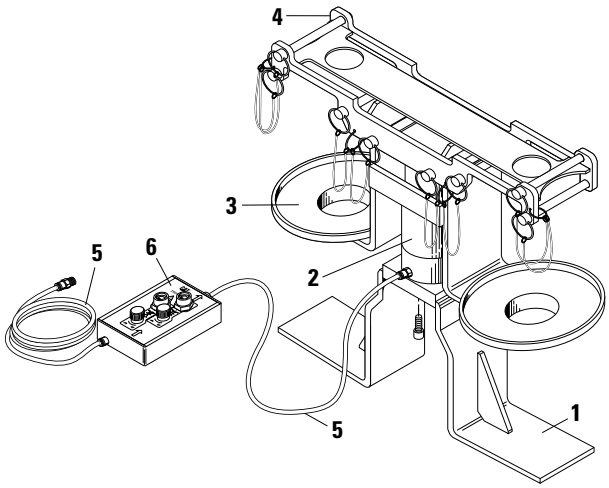
Overall length	139 mm (5.5 in)
Pilot diameter	6.0 mm (.24 in)
Pilot length	27 mm (1.1 in)
Thread	5/16-18

Reference

SENR3594 Service Manual Module of SENR3590 Service Manual

SENR3600 Service Manual Module of SENR3595 Service Manual

Main Bearing Cap Handling Group



156-7168 Main Bearing Cap Handling Group (part of 179-1904 Stud Tensioner Tool Group)		
Item	**Part No.**	**Description**
1	160-0476	Bearing Cap Lift Base
2	160-0464	Air Cylinder
3	160-0473	Lift Assembly
4	178-9141	Bearing Cap Lift Bracket
5	5P-6011	Air Line
6	160-0465	Air Control Box

Reference

NEHS0762 Tool Operating Manual; Operation and Maintenance of the 179-1904 Stud Tensioner Tool Group Used on 3618 Engines

RENR1333 Service Manual; Disassembly and Assembly of 3618 Engines

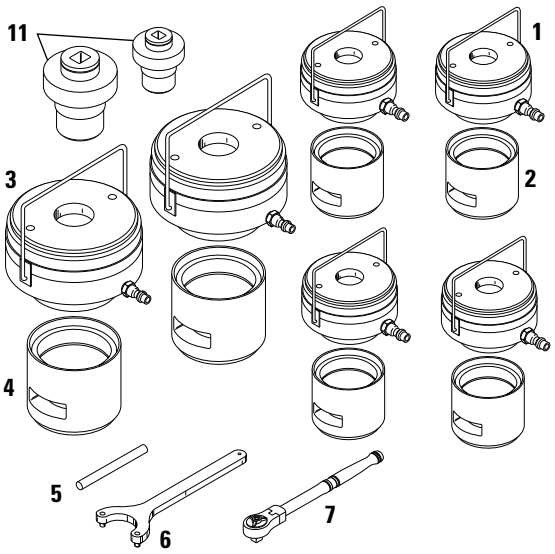
191-5320 Stud Tensioner Tool Group
229-9453 Pump Accessory Group
Hydraulic Pumps

SMCS Code: 1000, 1100, 1203, 0617, 0632
Model: All 3600 Engines Except 3618

CE Compliant

- Used to simultaneously loosen or tighten nuts on four cylinder head studs or two crankshaft main bearing cap studs
- Used with 8T-0960 Handling Tool Group for easier removal and installation of main bearing caps
- Requires one 191-5320 Group, one 229-9453 Group, and one of optional pumps listed
- Compact, lightweight cylinders have convenient carrying handles
- 3612 and 3616 Diesel Engines also require two each 225-5637 Support and 225-5636 Adapter
- Optional gear drive permits faster installation of nut onto stud (uses a 1/2 inch square drive ratchet)
- ISO9001 Certified

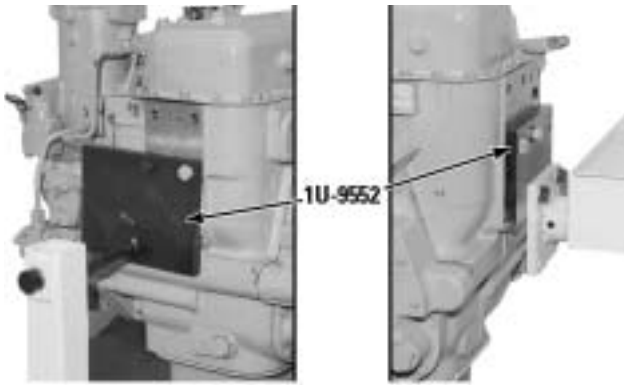
Basic Tooling Required



191-5320 Stud Tensioner Tool Group (required)			
Item	**Part No.**	**Description**	**Qty.**
1	191-5322	Cylinder Head Cylinder Group	4
2	191-5333	Cylinder Head Support	4
3	191-5323	Main Bearing Cylinder Group	2
4	191-5335	Main Bearing Support	2
5	9U-5141	Nut Turning Handle	2
6	—	Spanner Wrench	2
7	—	Swivel Head Ratchet (1/2 inch square drive)	2
11	191-5324 191-5326	Bushing (For 191-5322 Group) Bushing (For 191-5323 Group)	4 2

1U-9552 Bracket Group

SMCS Code: 3108-017, 3210-010, 3222-010
Model: 943, 953, 963, 973

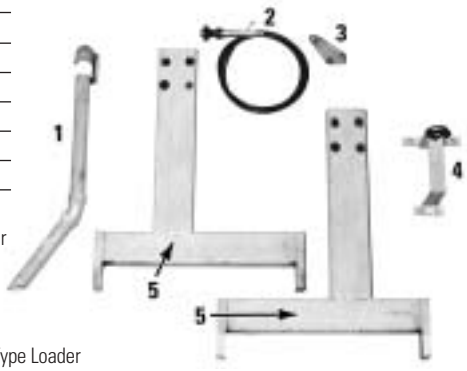


- 1U-9552 Bracket Group used to mount hydrostatic transmissions on 1U-7502 Repair Stand
- Repair stand allows hydrostatic unit to be rotated 360° which is necessary to set bearing clearances and install certain parts without damaging seals and gaskets

Hydrostatic Transmission Tools

SMCS Code: 3224-025
Model: 963 and 973 Track-Type Loaders

Item	Part No.	Description
1	4C-6179	Overflow Assembly
2	4C-6182	Control Cable
3	4C-6128	Shift Cable Bracket
4	9U-5162	Lifting Bracket
5	9U-5214	Transmission Support



- Used to lift, support, and test hydrostatic transmissions
- Using the proper hardware simplifies installation onto the test bed
- Reduces time spent securing transmission to test center
- Lifting bracket allows transmission to be lifted in a level position, making installation of support brackets much easier
- Transmission supports will rigidly secure transmission to test bed or store it after testing
- Control cable allows test operator to control transmission from a distance
- Overflow assembly directs oil into test bed, preventing it from splashing onto the floor
- All parts, with exception of overflow tube, can also be used to test hydrostatic transmissions on 945 and 953 Track-Type Loader

Reference

NEHT6037 Test Procedure (973)

NEHT6040 Test Procedure (963)

5P-8693 Lifting Bracket

SMCS Code: 3050-010
Model: Later 7155 (Truck) Transmissions

- Required to remove and install front clutch assembly because later transmissions have front clutch outer housing that prevents use of other lifting devices
- Designed for use with later clutches that have 5/16 inch-18 threaded hole; 2B-2695 Bolt should be used for attaching lifting bracket
- Earlier rotating housings can be modified by adding tapped hole according to instructions obtained from Service Engineering
- Can also be used to lift other loads not exceeding 410 kg (900 lbs.) if lifting force is perpendicular to hook hole

4C-6760 Support Assembly

SMCS Code: 3000-010
Model: 416, 426, 428, 436, 438 and 446 Backhoe Loaders
Warranty: None

- 4C-6760 Support Assembly used in removing and installing transmissions on all backhoe loaders
- FT2359 Torque Converter Support used on 446 Backhoe Loader to support torque converter as transmission is being removed or installed
- FT2362 Engine Support used to support rear of engine when removing or installing transmission on 446 Backhoe Loader
- Tools allow fast, easy, safe, one-man operation
- Front dash, floor plates, seat and, in some cases, brake pedals have to be removed; support is centered over transmission with movable leg secured to one of the seat mounting locations; a chain fall, or 9S-9100 Sling Assembly, is used to raise and lower transmission

Electrical Connector Removal and Crimp Tools

SMCS Code: 3168-010
Model: Models with CE-Series Electrical Connectors

- Required to service "CE" (Caterpillar Environmental) series electrical connectors; "CE" connectors replace VE (Vehicle Environmental) connectors which are used in harnesses where high temperatures, a large number of contacts, or higher current capacity contacts are needed
- Enable repair to be made without replacing complete wiring harness
- Removal tool needed to remove contacts without damaging connector retaining clips
- Crimping necessary when replacing "CE" contacts
- Solder will not make a good bond with contact material

Reference

SEHS9065 Special Instruction

Item	Part No.	Description
1	8T-5319	Removal Tool Group
	4C-4071	Removal Tool, 4-6 Ga.
	4C-4072	Removal Tool, 8-10 Ga.
	4C-4073	Removal Tool, 12-14 Ga.
	4C-4074	Removal Tool, 16-18 Ga.
2	4C-4075	Crimp Tool, 4-10 Ga.
	4C-4076	Retainer Assembly, 4-6 Ga. – right and left sides
	4C-4077	Retainer Assembly, 8-10 Ga. – right and left sides
	4C-4078	Jaw Assembly (1)
3	1U-5804	Crimp Tool, 12-18 Ga.

1P-3550 Wiring Tester Group

Discontinued — Service Parts Available

Item	Part No.	Description
1	1U-2863	Overlay (657A, 666A — 7 pin, 10 pin) (666B Rear Engine Electric Start — 16 pin) Later 1P-2863 Overlays are imprinted on both sides to cover the 666B with electric start rear engine also.
2	1P-2862	Overlay (657A, 666A — 16 pin) (657B, 666B — 16 pin, 10 pin)
3	1P-2864	Overlay (773 Truck), also pre EMS 769 Trucks
4	1P-2858	Battery Lead Wire (black)
5	1P-3076	Ground Adapter Assembly
6		Receptacle Adapter Cable Assembly (10 pin to 16 pin)
7		Plug Adapter Cable Assembly (10 pin to 16 pin)
8	1S-9532	Jumper Wire Assembly
9	1P-3071	Jumper Wire Assembly
	7N-5876	Bulb (not shown)
	8M-0454	Fuse (not shown)
10	5M-3215	Test Prod
11	1P-2857	Battery Lead Wire (red)
12	8S-4627	Circuit Tester

Reference

SMHS7683, Troubleshooting 1P-3550 Tester Group

SMHS7424 Special Instruction, replacing harness with detachable harness

6V-7013 Rivet Roll Set
6V-4829 Support
6V-4844 Driver

SMCS Code: 3150-036
Model: 7155

- Used for assembling pistons and poppet valves for 7155 transmissions
- 6V-7013 Rivet Roll Set needed to install 9N-4116 Pistons on 9N-4115 Poppet Valves used in 7155 transmissions; provides more accuracy than automatic center punch formerly used; can also be used for clinching 5/32 (4) diameter rivets in other service applications
- To prevent damage to poppet valve, 6V-4829 Support used to hold poppet valve while piston is installed
- FT1484 Support also used to hold 9N-4117 Plate and Valve Assembly during installation of poppet valves
- 6V-4844 Driver used for assembling the 2 valves which are used together in air pressure regulator for output clutch

Reference

7155 Service Manual, instructions for use of rivet roll set

SEHS7754-01 Special Instruction, installation of poppet valves and pistons

Challanger Bearing Tools

SMCS Code: 3030-015, 3030-016, 7051-029
Model: Challenger 35, 45, and 55 Agricultural Tractors

128-5041 Bearing Puller

- Used to remove bearings from shafts in clutch assembly (works on tapered or straight roller bearings)
- Used with two 5/8-18 threaded rods (puller legs) or jaw-type pullers
- Provides pulling contact to bearing's inner race, unlike standard pullers which pull on outer race (prevents damage to bearing rollers and cage and allows undamaged bearings to be used again)
- Offset puller face allows removal of recessed bearing in clutch plate housing
- Heat-treated for added durability

128-5042 Bearing/Gear Puller

- Used to remove various press fit bearings and gears from transmission and power train components
- Used with two 5/8-18 threaded rods (puller legs) or jaw-type pullers
- Heat-treated for added durability

128-5043, 128-5044, 128-5045, and 128-5046 Bearing Drivers

- Used to assemble press fit bearing onto shaft (helps prevent damage that can occur when using other more traditional methods of bearing installation)
- Driver uses shaft as pilot (tool design prevents slipping and applies force to inner race, exactly where required)
- Provides adequate length to properly seat bearing without using additional spacers or other tooling
- Heat-treated for added durability

Reference

SENR8305 Service Manual, Challenger 35, 45, and 55 Agricultural Tractor Transmission Disassembly and Assembly

SENR8308 Service Manual, Challenger 35, 45, and 55 Agricultural Tractor Power Train Disassembly and Assembly

128-5047 Rotation Shaft

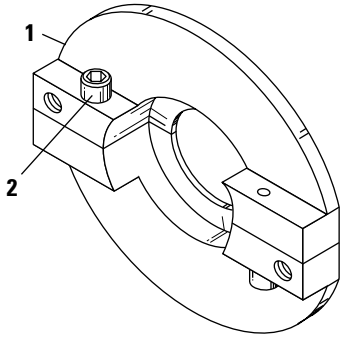
- Used to rotate the shaft when seating bearings and gears (inclined ends expand tool's diameter as nut is tightned)
- Also used to rotate the shaft to remove backlash from a gear train
- Provides a method of raising and lowering the shaft to check and adjust endplay
- Heat-treated for added durability

128-5048 Indicator Base

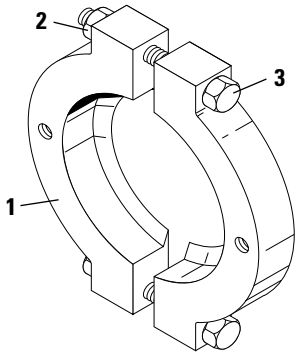
- Used as an indicator base for measuring shaft end play (sits in counterbore around shaft)
- Used with 128-5047 Rotation Shaft, 3P-1565 Collet, 1U-8869 Indicator, 5P-4162 Point, and 6V-2030 Extension

128-5049 Guide Stud

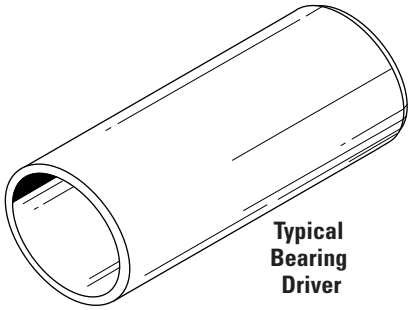
- Used to guide frame rails while separating and joining transmission housing (two required)
- Installs into M20 x 2.5 threaded holes in transmission housing
- Wrench flats provide easy installation and removal
- Heat-treated for added durability



Item	Part No.	Description	Size	Puller Holes	Overall Diameter
1	128-5041	Bearing Puller	—	5/8-18	200 mm (7.9 in)
2	5S-2586	Socket Head Bolt	3/8-16 x 44.5 mm (1.75 in)	—	—

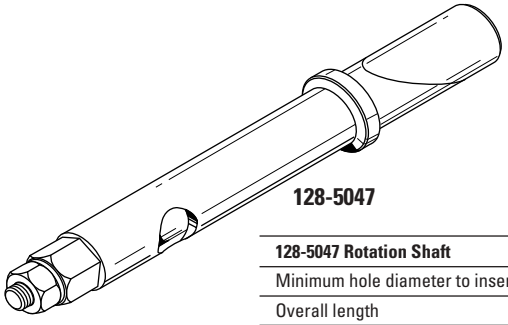


Item	Part No.	Description	Size
1	128-5042	Bearing/Gear Puller	
2	6V-8188	Hex Nut	1/2-13
3	8S-9089	Hex Head Bolt	1/2-13 x 114 mm (4.5 in)



Typical Bearing Driver

Bearing Drivers	Inside Diameter
128-5043	55.6 mm (2.19 in)
128-5044	55.6 mm (2.19 in)
128-5045	50.7 mm (2.00 in)
128-5046	45.7 mm (1.80 in)



128-5047

128-5047 Rotation Shaft	
Minimum hole diameter to insert shaft	40.5 mm (1.60 in)
Overall length	311.2 mm (12.25 in)

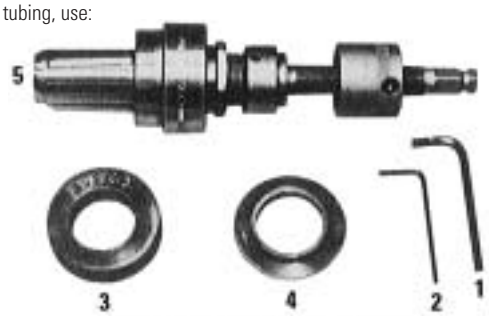
Tube Expander Tool Groups

SMCS Code: 3154-510, 7051-510
Model: D8L, D9L, D10

- Used to mechanically expand tubing joints in the case and frame assemblies
- When replacing outside diameter tubing, use:
  8T-0925 for 25.4 mm (1.0 in)
  8T-2845 for 31.75 mm (1.25 in)

Reference

SEHS8467 Special Instruction



Typical Tube Expander Tool Group

Item	Part No.	Description	Outside Diameter Tubing
Service Parts in 8T-0925 Group			25.4 mm (1.0 in)
1	4B-9820	Wrench	
2	8B-3618	Wrench	
3	8T-0923	Gauge	
4	8T-0924 8T-0926 8T-0927 8T-0929 8T-0931	Spacer Spacer Spacer Spacer Spacer	
5	8T-0928	Expander Assembly	
Service Parts in 8T-2845 Group			31.75 mm (1.25 in)
1	4B-9820	Wrench	
2	8B-3618	Wrench	
3	8T-2846	Gauge	
4	8T-0919 8T-0922	Spacer Spacer	
5	8T02847	Expander Assembly	

Spring Compressor Tools

SMCS Code: 4100-016
Model: See Below

- Used with other tools for compressing steering clutch springs when disassembling steering clutches in field

Item	Part No.	Description	Model
1	1B-9065	Bolt	D8, 583, D9
2	9S-1373	Bolt	D6, D7, No. 6, 572, 977

Steering Clutch Assembly Installation Tools

SMCS Code: 4100-012
Model: D4C, D4D, D5, D6B Tractors, 955 and 977 Traxcavator and 562B Pipelayer

- Used to install steering clutch assemblies on bevel gear shafts
- Also used to install final drive pinion flanges

Item	Part No.	Description
1	7B-8364	Bolt
2	7M-7237	Adapter
3	7M-7238	Sleeve
4	7B-8363	Bolt

8F-3671 Gear Installation Group

SMCS Code: 4100-012
Model: R2 and D2 Tractors

- Used for steering clutch assembly installation

Item	Part No.	Description
1	8F-3668	Nut
2	8F-3670	Stud
3	8F-3669	Spacer
4	8F-3667	Nut
5	6H-6988	Sleeve (D9 Tractor Only)

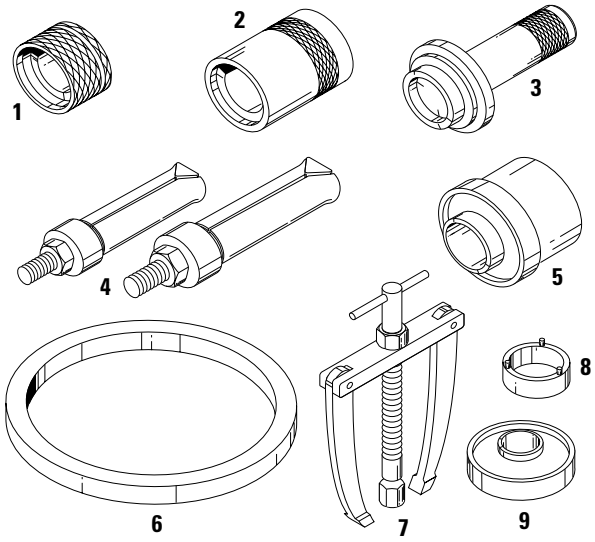
Front Axle Tooling

SMCS Code: 4084-017, 3260-015, 3260-016, 4318-010, 4091-017, 0722
Model: 416C, 426C, 428C, 436C, and 438C Backhoe Loaders

- Used to disassemble axle without damaging components and to assemble components to correct specifications (these tools are essential to service the machine)
- Used with other common shop tools to make disassembly and assembly easier and faster (helps eliminate damage caused by using improper tools)

Reference

SENR1206 Service Manual, Disassembly and Assembly, 416C, 426C, 428C, 436C, and 438C Backhoe Loaders Power Train



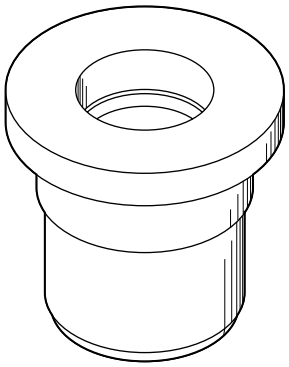
Service Tools for D&A of C-Series BHL Front Axle (AWD)

Item	Part No.	Description	Supplier Part No.	Use
1	140-0162	Bearing Extractor Ring	5870-030-030	Remove the taper roller bearing from final drive hub
2	140-0163	Seal Driver	5870-048-154	Install seal to correct depth on steering knuckle bearing pin
3	140-0164	Seal Driver	5870-048-155	Install shaft seal to correct depth in steering knuckle
4	140-0165	Internal Puller	5870-300-005	Remove sleeve from axle housing bore
4	140-0169	Internal Puller	5870-300-007	Remove bearing seals and races from axle housing
5	140-0166	Seal Driver	5870-048-158	Install pinion shaft seal to correct depth in axle housing
6	140-0167	Centering Ring	5870-200-062	Measure and adjust pinion depth and backlash Used with 8T0976 Measuring Cover
7	140-0168	Two Leg Puller	5870-300-003	Remove miscellaneous seals, races, and sleeves from axle housing
8	140-0170	Measuring Ring	5870-340-034	Determine sleeve length in order to acquire correct rolling torque of pinion bearings
9	140-0171	Adapter Ring	5870-500-032	Measure axle housing to determine correct pinion depth

247-4298 Seal Driver

SMCS Code: 3286-017, 0722
Model: D1-Series Back Hoe Loaders (All Wheel Drive)
Essential Tool

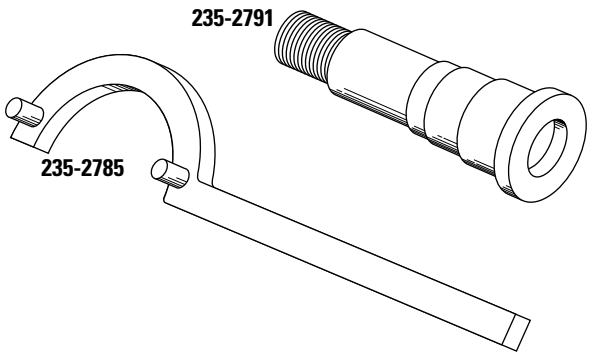
- Used to properly install pivot shaft seals on front axle
- Seals will not remain seated if improperly installed



235-2785 Pinion Wrench
235-2791 False Pinion

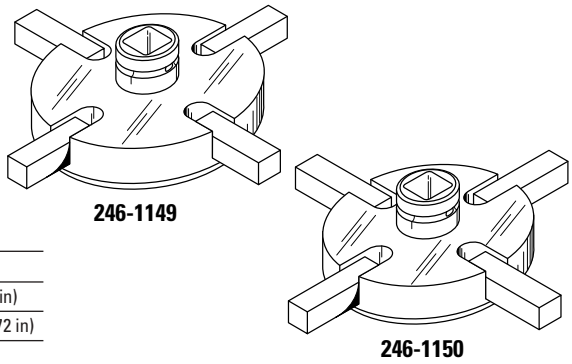
SMCS Code: 3258
Model: All Wheel Drive D-Series Backhoe Loaders produced after 15 Aug 2003
Essential Tool

- Used to set pinion shim height (pinion depth setting) on differentials



246-1149 Spanner Wrench Assembly
246-1150 Spanner Wrench Assembly

SMCS Code: 3258-017
Model: M325C Material Handler Excavator
Essential Tool



- Used to make backlash adjustments on differential ring gear
- Used with a 1/2 inch square drive ratchet

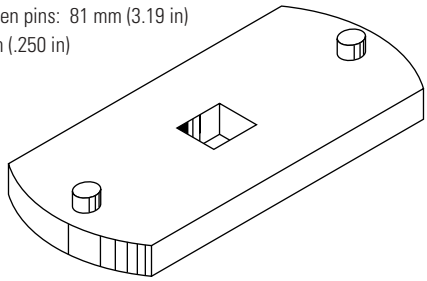
Reference
SENR7164 M325C Material Handler Service Manual, Power Train Disassembly and Assembly

Number of teeth	4
Tooth width	10 mm (.39 in)
Outside diameter	120 mm (4.72 in)
Center guide diameter	
246-1149	90 mm (3.54 in)
246-1150	80 mm (3.15 in)

202-7965 Gear and Pinion Spanner Wrench

SMCS Code: 3257-025
Model: TH103
Essential Tool

- Used to adjust backlash on differential ring gear and pinion
- Used with 1/2 inch square drive ratchet
- Provides positive engagement with adjusting nut
- Makes adjustment procedure easier
- Center distance between pins: 81 mm (3.19 in)
- Pin diameter: 6.35 mm (.250 in)



6V-9139 Adapter

SMCS Code: 3259-010
Model: 613, 613B Scrapers

- Used for removal and installation of rear axle shaft
- Threads onto axle and is pinned through 5F-9888 Adapter to rod of puller cylinder

Internal threads	(2.933-12 NS-3B)
Capacity	70 tons

Adjusting Ring Spanner Wrenches

SMCS Code: 3258-017
Model: 834B Wheel Tractor, 836 Landfill Compactor, and 988F Wheel Loader

- Used to disassemble and assemble 5K-3559, 8R-2857, and 8R-2861 Adjusting Rings
- Adjustment of rings can be difficult and time consuming without proper tools — spanner wrench provides positive engagement for this operation
- Wrenches have 1 5/16 inch hex for rotating and measuring torque

Typical Adjusting Ring Spanner Wrench

Part No.	Pilot	Adjusting Ring	Model
9U-7397	118.0 mm (4.65 in)	5K-3559	988B Wheel Loader
9U-7398	126.0 mm (4.96 in)	8R-2857	834B, 836, and 988F models
9U-7398	147.0 mm (5.79 in)	8R-2861	834B, 836, and 988F models

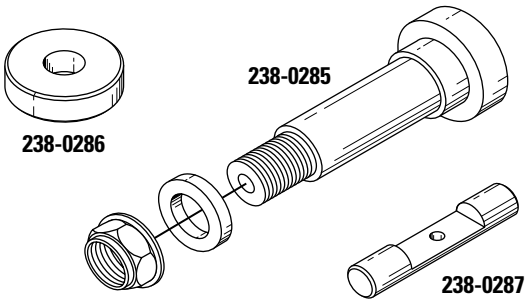
Reference
SENR5729 Service Manual, 988F Vehicle Systems Disassembly and Assembly

Setting Pinion Shim Height in Telehandler Rear Axle

SMCS Code: 3258-025
Model: TH460B, TH560B TeleHandler
Essential Tool

- Used to set pinion shim height in rear axle differential

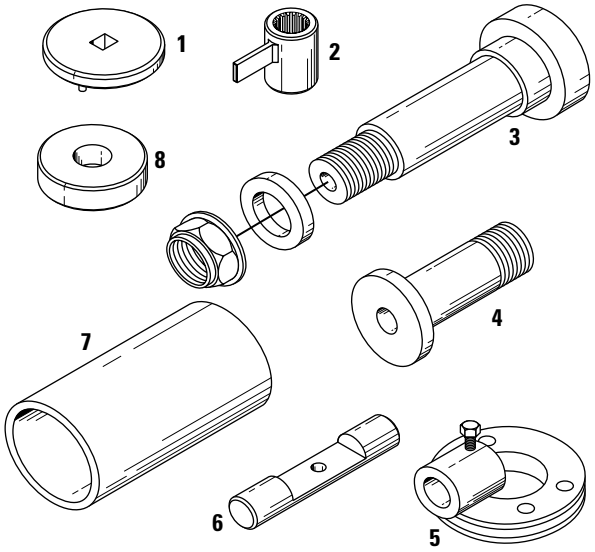
Part No.	Description
238-0285	False Pinion
238-0286	Disc
238-0287	Shaft



Axle Repair Tooling

SMCS Code: 3258-025
Model: TH210, TH215, TH350B, and TH360B Telehandlers
Essential Tool

Item	Part No.	Description	Use
1	235-2797	Spanner Wrench, 210/215/350B/360B Front and Rear Axle	Adjust differential bevel gear backlash
2	235-2783	Backlash Wrench, 210/215 Front Axle	Measure backlash on TH210 and TH215 front axle differentials
3	235-2788 235-2789 235-2790 238-0285	False Pinion, 350B/360B Front Axle False Pinion, 350B/360B Rear Axle False Pinion, 460B Front Axle False Pinion, 460B Rear Axle	Set pinion shim height on front and rear axle differentials
4	235-2786 235-2787	False Pinion, 210/215 Front Axle False Pinion, 210/215 Rear Axle	Set pinion shim height on front and rear axle differentials
5	235-2784	Pinion Wrench, 350B/360B Front and Rear Axle	Remove and install pinion nut
6	235-2796 238-0287	Shaft, 210/215/350B/360B Rear Axle Shaft, 460B Rear Axle	Set pinion shim height on rear axle differentials
7	235-2792 235-2793 235-2794	False Differential, 460B Front Axle False Differential, 350B/360B Front Axle False Differential, 210/215 Front Axle	Set pinion shim height on front axle differentials
8	235-2795 238-0286	Disc, 210/215/350B/360B Rear Axle Disc, 460B Rear Axle	Set pinion shim height on rear axle differentials



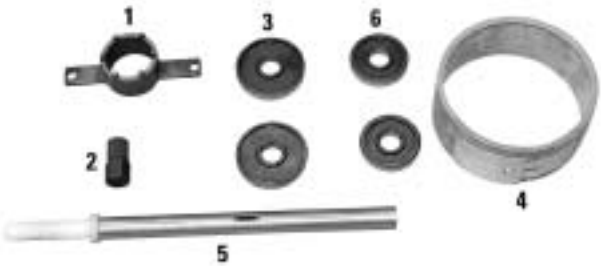
Special 90° Gear Reducer Tools

SMCS Code: 3250-017
Model: CS553 and CP553 Vibratory Soil Compactors

- Special tools required to correctly disassemble and assemble 90° gear reducer

Reference

KELR2134 Service Manual, CS553 Vibratory Soil Compactors-Smooth Drum
KELR2135 Service Manual, CP553 Vibratory Soil Compactors-Padded Drum



Item	Part No.	Description	Use
1	4C-5500	Hook Spanner	Removal and Installation drive pinion slotted nut
2	4C-5498	Profiled Pin	Removal and Installation drive pinion slotted nut
3	4C-4059	Centering Plate (2)	adjust gears and bearings
4	1U-5933	Seal Installer	install Duo-cone seals
5	1U-5847	Measuring Shaft	adjust gears and bearings
6	4C-5499	Centering Plate (2)	adjust gears and bearings

Gear Final Drive Sprocket and Support Removal Tools

SMCS Code: 4050-010, 4050-017
Model: See Below

- Attachments for hydraulic service tools that make it possible to use hydraulic force to remove and install tight fitting components such as final drive sprockets, gears, and bearing supports
- Basic use of each tool is described below but some tools are also used in other operations

NOTE: Tonnage capacity of tool is given in parentheses. Use of tool is limited to the cylinder of that tonnage; i.e., 9S-8900 Cylinder Group for 70 ton applications and 9S-8901 Cylinder Group for 100 ton applications.

Sprocket Removal Tools			
Item	**Part No.**	**Description**	**Use**
1	6H-4138	Arm	Sprocket removal[1]
2	6H-4158	Pin (100 ton)	Sprocket removal[1]
3	5P-2421	Adapter	Spoke type sprocket removal[1]
4	6F-5404	Yoke	Sprocket removal, early Motor Graders
5	8F-6220	Nut	Disc type sprocket removal[1]
6	6H-1625	Adapter	Disc type sprocket removal[1]
7	5H-9909	Pin Assembly (70 ton)	Sprocket removal[1]
8	5F-9306	Arm	Sprocket removal[1]
Not shown	7B-2499	Ring	

[1] Refer to Service Manual or RTL

Final Drive Sprocket, Gear and Support Removal Tools			
Item	**Part No.**	**Description**	**Use**
1	8M-4843	Adapter Assembly (100 ton)	Sprocket installation, D8H, 583H
2	8M-4839	Adapter Assembly (100 ton)	Sprocket installation, D9E
3	8M-4851	Adapter Assembly (100 ton)	Sprocket installation, D, DD9G, 594
4	8M-4847	Sleeve Assembly (100 ton)	Sprocket installation, D9, DD9G, 594
5	9H-3992 1S-6645	Head (100 ton) and Sleeve Assembly (100 ton)	Sprocket installation, D7E, D7F, 572E, 983, D8H, 583H, D9G, DD9G, 594
6	 7F-5283 7F-5285	Pusher Group (70 ton) Consists of: Head Sleeve	Sprocket installation, D4, D4C, D4D, 941, 951, D5, D6, D6B, 561C
7	1M-6747	Sleeve Assembly (100 ton)	Final Drive Bearing Support removal and installation, D8H, 583H; also Sprocket removal, D9, DD9G
8	6H-4133	Sleeve (70 ton)	
	6H-4134	Sleeve (70 ton)	Final Drive Support removal, early D9
9	5F-7693 5F-7694 7S-9484	Spacer Assembly (70 ton) Plug (70 ton) Spacer Assembly (70 ton)	 Sprocket Hub Inner Bearing removal, D5
10	8M-4856	Sleeve (70 ton)	Plate Carrier installation, D9G
11	8M-9003	Sleeve Assembly (100 ton)	Sprocket removal, D7E
12	7F-6068	Sleeve Assembly (70 ton)	Sprocket installation, D2, D3, 931
13	1M-6756	Sleeve Assembly (100 ton)	Final Drive Outer Bearing Support installation, D8H, 583H
14	6H-4135	Sleeve Assembly (100 ton)	Final Drive Support installation, D9 Tractors
15	8M-9010	Sleeve (100 ton)	Sprocket installation, 955K, D6C, 561C, D7E, 572E
16	5P-6541	Sleeve (70 ton)	Final drive bearing installation, D2, D3, 931; final drive gear removal, D2 (replaces discontinued 5F-9897)

Duo-Cone Seal Installers

SMCS Code: 4050-012
Model: Nearly All Caterpillar Machines

- Required for proper installation to ensure reliable performance of seals
- Chart 1 lists conventional seal installers along with data to help identify associated seal groups; specific installer part number required for each seal group part number is in column 4 of Numerical Parts Record
- Chart 2 lists current inverted seal group part numbers along with correct installation tools for each application; inverted seal may require several different installers depending on where it is installed; installer locates seal group correct distance from reference surface, which may differ with each application

Chart 1 — Conventional Seal Installers

Part No New	Part No Old	Toric Cross Sec.0 (mm)	Seal Ring O.D. (mm)	Ramp Angle	Assembled Height (mm)
4C-6528	8T-0527	12.7	700	15°	14.5±1.2
140-7642	8T-0530	12.7	533.4	15°	14.5±1.2
8T-0531	7S-3128	12.7	457.2	15°	11.5±1.0
8T-9206	1S-4320	12.7	394.46	15°	11.5±1.0
8T-7789	1S-4320	12.7	394.46	8°	14.6±0.9
1U-5933	8M-7913	12.7	346.46	15°	11.5±1.0
1U-5934	8M-7913	12.7	346.46	8°	14.6±0.9
173-6703	—	12.7	338	15°	11.5±1.0
126-3994	—	12.7	328	15°	11.5±1.0
220-5726	—	12.7	310.86	150	11.5±1.0
1U-6434	8M-7912	12.7	292.86	15°	11.5±1.0
1U-6435	8M-7912	12.7	292.86	8°	14.6±0.9
1U-6438	8M-9395	12.7	259.59	15°	11.5±1.0
1U-6436	8M-9395	12.7	251.46	15°	11.5±1.0
1U-6437	8M-9395	12.7	251.46	8°	14.6±0.9
1U-6439	8M-7911	12.7	210.31	15°	11.5±1.0
1U-6440	8M-7911	12.7	210.31	8°	14.6±0.9
1U-6441	9M-5143	12.7	191.26	15°	11.5±1.0
1U-6442	9M-5143	12.7	191.26	8°	14.6±0.9
1U-6443	1S-8966	12.7	171.70	15°	11.5±1.0
1U-8849	5S-4275	9.47	146.05	15°	7.8±0.6
1U-8849	5S-4275	9.47	146.05	8°	8.8±0.6
1U-8699	7L-4949	9.47	141.22	15°	7.7±0.6
1U-8842	5M-2162	9.47	119.08	8°	8.8±0.6
1U-8842	5M-2162	9.47	119.08	20°	8.8±0.6
1U-8841	5M-2160	9.47	109.52	20°	8.8±0.6
1U-8840	5M-2158	9.47	92.08	20°	8.8±0.6
224-9466	1U-8843	9.47	82.55	20°	8.8±0.6
1U-8697	2S-8027	6.22	168.15	15°	7.7±0.6
1U-8698	5S-4276	6.22	156.97	15°	7.7±0.6
1U-8699	7L-4949	6.22	141.22	15°	7.7±0.6
1U-8850	5P-0297	6.22	104.78	15°	7.7±0.6

5F-9693 Adjustable Bevel Gear Spanner Wrench

SMCS Code: 4076-025
Model: Most Caterpillar Final Drive Sprockets

- Equipped with two jaws, one 3/8 inch thick to permit it to be used for bevel gear adjustments where space is limited, the other 3/4 inch thick for heavier operations
- Lightweight
- Forged jaws adjust to eleven positions from 121 mm (4 3/4 in) to 324 mm (12 3/4 in) outer diameter.
- Round handle to permit use of "cheater pipe" where additional leverage is required
- Not advisable to use on D8 sprocket retaining nut; wrench with offset handle provided for this operation

Item	Part No.	Description	Size
1	5F-9695	Jaw	9.52 mm (3/8 in) thick
2	5F-9696	Jaw	19.05 mm (3/4 in) thick
3	5F-9697	Pivot Pin	—
4	5F-9694	Handle	609.6 mm (24 in) long

Sprocket Retaining Nut Spanner Wrench

SMCS Code: 4076-025
Model: Most Caterpillar Final Drive Sprockets

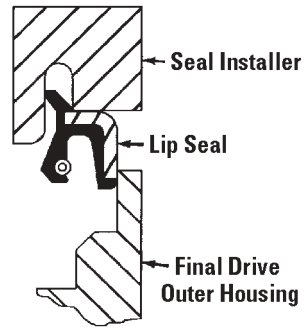
- Used on older D8 and other tractors to tighten and loosen sprocket retaining nuts

Part No.	Description	Use
2B-0801	Wrench	to remove nut
2B-0802	Wrench	to tighten nut

Seal Installers

SMCS Code: 4050-012
Model: 120G, 130G, 12G, 140G, 14G, 16G Motor Graders

- Used to install lip-type seal on final drive (outer housing)
- Seal installers available in four different sizes
- Proper tooling eases seal installation
- Reduces seal damage by not striking seal directly
- Installer designed with shoulder to assure installation force is distributed evenly to metal cage
- Counterbore protects lip of seal during installation (see illustration)
- All seal installers hardened to R_c 37-42 for durability



Cross section of installer showing shoulder and counterbore

Part No.	Used with	OD x ID x thickness	Weight
9U-6724	6V-8082 Seal	327 x 268 x 41 mm (12.9 x 10.6 x 1.6 in)	7 kg (14.5 lbs.)
9U-6725	6V-8081 Seal	359 x 295 x 41 mm (14.1 x 11.6 x 1.6 in)	8 kg (17.0 lbs.)
9U-6726	6V-8384 Seal	457 x 394 x 41 mm (18.0 x 15.5 x 1.6 in)	10 kg (22.5 lbs.)

Motor Grader Tandem Removal and Installation Tooling

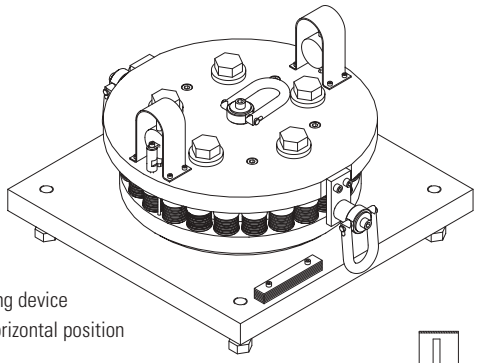
SMCS Code: 4064-010
Model: G Series Motor Graders

- Used to simplify and reduce the time of removing and installing tandem drive housings — eliminates need to disconnect drive chains
- Allows tandem assembly with sprockets to be removed and installed as a unit — a pipe or pry bar can be inserted through sprockets to maintain alignment when guide is removed
- Sprocket guides thread directly onto tandem drive axle (1 5/16 inch hex head accepts sockets or combination wrenches for easy attachment)
- Tapered extension added to former design allows removal of sprocket guide from tandem assembly after it is removed from motor grader (sprocket guide can now be used to remove remaining tandem)
- The spanner wrenches provide a positive method to engage slots in spanner nut that retains the drive sprocket; a square drive permits use with a ratchet, breaker bar, or torque measuring device
- The lifting brackets provide a place to attach hooks from a suitable lifting device when removing and installing the tandem housings

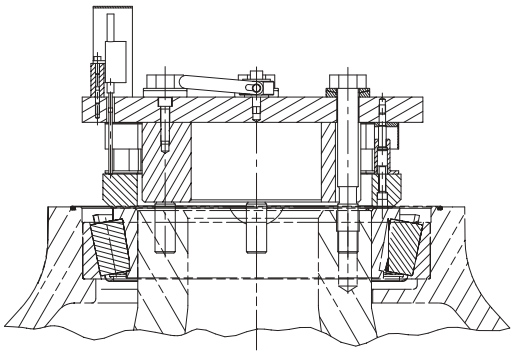
Front Wheel Bearing Preload Adjusters

SMCS Code: 4056-025
Model: 777, 785, 789, 793, and 797 Off-Highway Trucks
Essential Tool

- Made as ordered (MAO)
- Used to accurately adjust the amount of shims required for proper preload setting
- No calculations are required
- Improved accuracy over conventional methods
- Reduced adjustment time over conventional methods
- Less chance of error than with conventional methods
- Rugged design ensures long life and maintains calibration
- Includes a precision zero plate to assure high accuracy
- Indicators and all attachment hardware are included
- Lifting rings are provided to position preload adjuster with lifting device
- Front wheel assembly may be in a spindle-down, vertical, or horizontal position when using this tool
- Requires annual calibration



Part No.	Description	Model
200-4529	Preload Adjuster	777
200-4530	Preload Adjuster	785
200-4531	Preload Adjuster	789
200-4532	Preload Adjuster	793
200-4533	Preload Adjuster	797



1U-5771 Adapter

SMCS Code: 4058-010, 4164-010
Model: D6C and D6D Track-Type Tractors

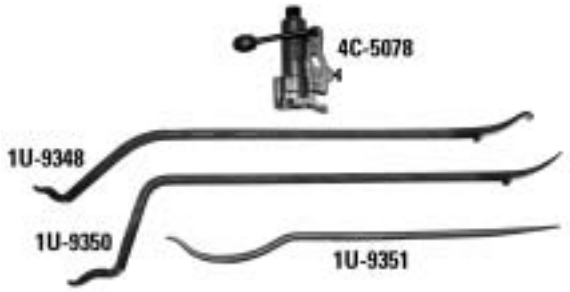
- Used to install final drive sprocket
- Replaces 5P-4183 Adapter in this application; 5P-4183 Adapter still used in other applications
- 5P-4183 Adapter mounted on sprocket shaft (dead axle) and allowed sprocket installation force to be received by inner tapered roller bearing; 1U-5771 Adapter mounts directly to bull gear hub and eliminates installation force from inner tapered roller bearings, reducing possibility of bearing damage during installation of sprockets

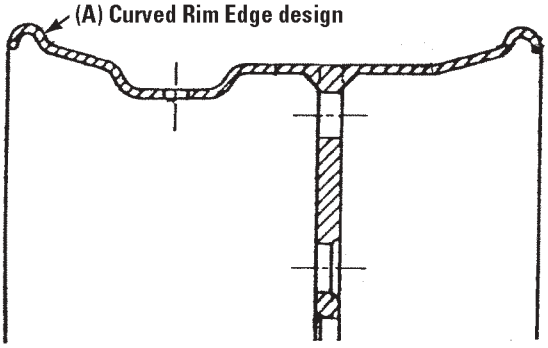
Tools to Mount and Dismount Single-piece Drop Center Rims

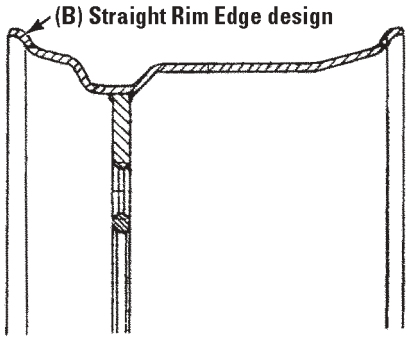
SMCS Code: 4200-017
Model: Backhoe Loaders, 910 and G910 Wheel Loaders, IT12 Tool Carriers, many small to mid-sized Wheel Loaders, Motor Graders, and Integrated Tool Carriers

- Used to mount and dismount single-piece drop center rims
- Easy to use, lightweight, and require no auxiliary power (perfect for remote field locations)
- Beadbuster easily separates tire from rim (almost impossible to do by hand)
- Levers are specifically designed for tire mounting and dismounting (unique shapes have distinct advantages over common pry bars)

NOTE: The 4C-5078 Beadbuster should be used on rims with a straight rim edge (B) design. It is not recommended for curved rim edges (A). Separating tires from (A) design rims can be accomplished with a conventional tire hammer and then the levers can be used for dismounting and mounting.







Part No.	Description
4C-5078	Beadbuster
1U-9348	Lever
1U-9350	Lever
1U-9351	Lever

Reference

Special Instructions, SEHS9068

Tire Clamp Groups (Skid Steer)

SMCS Code: 4200-017, 0730
Model: 216, 226, 228, 236, 246, and 248 Skid Steer Loaders

- Used to make tire removal quick and easy
- Used with 7F-8240 Tire Valve Repair Tool
- Unit is portable for field use with flat, level conditions
- Handles conventional and Low Side Wall (LSW) tires
- Use on single-piece rim wheels only

NOTE: Tire and rim are not included in 190-9862 Tire Clamp Group (Skid Steer).

188-3121 Tire Clamp Group (Skid Steer)		
Item	Part No.	Description
1	188-2744	Tire Clamp Group (Skid Steer)
2	190-5621	Lever Bracket Group
3	190-5625	Long Handle "L" Bar
4	190-5626	Tire Iron (2)

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5P-3042 Retaining Nut Spanner Wrench

SMCS Code: 4200-010
Model: 518

- Used to remove wheel retaining nut and to adjust bearing preload on earlier 518 Skidder which has larger 930-size spindle and final drive components
- Must be used because inner diameter of spindle is smaller than standard 930 spindle

5P-3044 Retaining Nut Spanner Wrench

SMCS Code: 4200-010
Model: 966, 950, 816, 815, 814, 528

- Used to remove wheel and to adjust bearing preload on 966, 950, 816, 815, 814 and 528 machines which have 9K-6198 Wheel Bearing Retaining Nut

Reference

Service Manuals (preload procedures)

5P-0295 Retaining Nut Spanner Wrench

SMCS Code: 4200-010
Model: IT12, 910

- Used to remove and install wheel bearing spanner nut

176-0404 Retaining Nut Spanner Wrench

SMCS Code: 4050-017, 0700, 0730
Model: 554 and 574 Forwarders

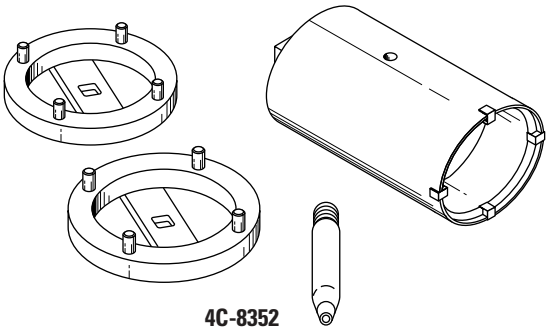
- Used to remove final drive bogey retaining nut
- Square drive: 3/4 inch
- Number of teeth: 4

Guide Bolt and Bearing Retaining Nut Spanner Wrenches

SMCS Code: 4202-710, Guide Bolt; 3013-017, Spanner Wrench
Model: See Below

- Two guide bolts allow one person to easily remove and install tire and wheel
- Spanner wrenches used to disassemble and assemble bearing retaining nuts in axle housing
- Square drive: standard 3/4 inch

Part No.	Description	Model
4C-8352	Guide Bolt	
4C-8345	Bearing Retaining Nut Spanner Wrench	936F, 950F, 518C
4C-8346	Bearing Retaining Nut Spanner Wrench	936F, 950F, 518C, 928F, IT18F, IT28F
4C-8348	Bearing Retaining Nut Spanner Wrench	928F, 966F
4C-8349	Bearing Retaining Nut Spanner Wrench	966F
4C-8500	Bearing Retaining Nut Spanner Wrench	966F
4C-8347	Bearing Retaining Nut Spanner Wrench	918F
4C-8502	Bearing Retaining Nut Spanner Wrench	918F, IT18F



4C-8352

Reference

SENR4920 Service Manual, 950F Wheel Loaders
SENR4765 Service Manual, 966F Wheel Loaders
SENR5760 Service Manual, 918F Wheel Loaders
SENR5230 Service Manual, 936F Wheel Loaders

Service Tools for Disassembly and Assembly of 214/224 Final Drive

Item	Cat Part No.	Description	Supplier Part No.	Service Manual Form HENR3095 Page No.-Illus. No.
1	1U-5844	Driver	5870-055-073	141-86 and 87
2	1U-5843	Driver	5870-055-036	99-53
3	8T-0514	Guide Bolt	5870-204-023	116-36 96-41

Service Tools for Disassembly and Assembly of 214/224 Final Drive

Item	Cat Part No.	Description	Supplier Part No.	Service Manual Form HENR3095 Page No.-Illus. No.
4	8T-0975	Handle	5870-260-002	92-26 and 27 93-29 and 30 95-39 and 40 99-53 and 54 141-86 and 87
5	1U-5845	Driver	5870-058-026	92-27
6	1U-5842	Driver	5870-055-006	92-29 and 30 95-39 and 40
7	8T-0995	Spanner	5870-656-004	94-35 137-72
8	1U-5846	Forcing Screw	5870-204-015	86-13 118-2 137-70
9	1U-5854	Pin Spanner Group	5870-656-005	87-7 100-60
10	8T-0522	Slide Hammer	5870-650-001	138-75
11	8T-0516	Pry Bar	5870-345-036	88-10 90-18 91-24

Service Tools for Disassembly and Assembly of 214/224 Transmission

Item	Cat Part No.	Description	Supplier Part No.	Service Manual Form HENR3095 Page No.-Illus. No.
1	1U-5841	Grab Sleeve	5870-026-021	121-14
2	8T-0504	Basic Set	5870-026-100	121-14
3	8T-0980	Grab Sleeve	5870-026-017	121-14
4	1U-5852	Guide	5870-651-027	124-23
5	1U-5853	Installer	5870-651-028	124-25

Service Tools for 213B and 214B Excavators

SMCS Code: 4000-017
Model: 213B and 214B Excavators

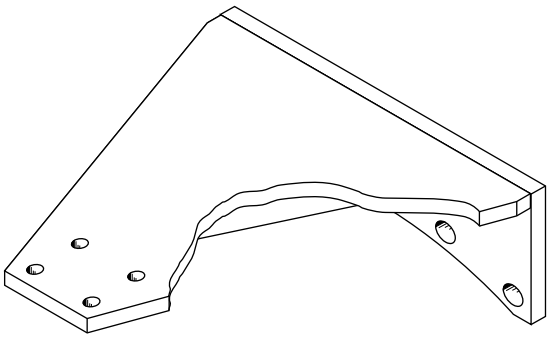
- Used mainly for disassembly and assembly of power train components
- Facilitate service support because they are very efficient for disassembly and assembly/remove and install operations
- All are applicable to 214B Excavator; 4C-4767 Spanner Wrench is the only tool that is also applicable to 213B Excavator

Service Manual reference: 214B Power Train Disassembly and Assembly, SENR4315

Item	Part No.	Description	Use
1	4C-4058	Spanner Wrench	Use to remove and install 8U-2342 Nut (front and rear final drive). Supplier Part No. 5870-401-105
2	4C-4059	Plate Group	Use to determine shim thickness for pinion gear tooth contact (front and rear differential). Supplier Part No. 5870-500-010.
3	4C-4060	Disc Alignment Tool	Use to align clutch plates (transmission). Supplier Part No. 5870-901-013.
4	4C-4061	Centering Plate	Use to remove and install 8U-2342 Nut (front and rear final drive)
5	4C-4062	Seal Driver	Use to install 8U-0534 Seal in 8U-2509 Cover (transmission). Supplier Part No. 5870-051-019.
6	4C-4656	Support	Use to remove 5W-5382 Needle Bearing from 8U-2457 Gear (transmission). Supplier Part No. 5870-300-011.
7	4C-4657	Puller	Use to remove 5W-5382 Needle Bearing from 8U-2457 Gear (transmission). Supplier Part No. 5870-300-012.
Not shown	4C-4655	Seal Driver	Use to install 8U-2355 Seal in 8U-2357 Flange (front and rear final drive). Supplier Part No. 5870-051-018.

160-1728 Adapter Bracket Assembly

SMCS Code: 3258-017
Model: 797 Off-Highway Trucks
Essential Tool



- Used to support and rotate differential carrier during disassembly and assembly (two brackets required)
- Used with 4C-9832 Large Engine Roll-Over Stand
- Bracket allows 360° rotation for easier access to all surfaces and attached components
- Bracket attaches to differential using 7X-0445 Hex Head Bolt, 7X-0451 Hex Nut, and 7X-0533 Flat Hard Washer
- Bracket attaches to engine stand using 7X-0370 Hex Head Bolt, 6V-8182 Hex Nut, and 8T-4994 Flat Hard Washer
- Length x Width x Height: 625.0 mm (24.60 in) x 565.0 mm (22.25 in) x 254.0 mm (10.00 in)

Attachment Hardware		
Part No.	**Size**	**Quantity**
7X-0445	1 1/4-7 x 5.0 inches long	8
7X-0451	1 1/4-7	8
7X-0533	1 1/4 inch	16
7X-0370	3/4-10 x 3.5 inches long	8
6V-8182	3/4-10	8
8T-4994	3/4 inch	16

Differential Bearing Pullers

SMCS Code: 3258-011
Model: 797 Off-Highway Truck
Essential Tool

- Used to remove bearing cones without cutting/grinding inner bearing race (rollers and cage must be removed from race prior to use this tooling)
- Used with hydraulic cylinder, hose group, and pump
- Reduces risk to maintenance personnel due to broken race and cup (applies even removal force on entire bearing race)
- Reduces chance of damaging differential housing during bearing race removal

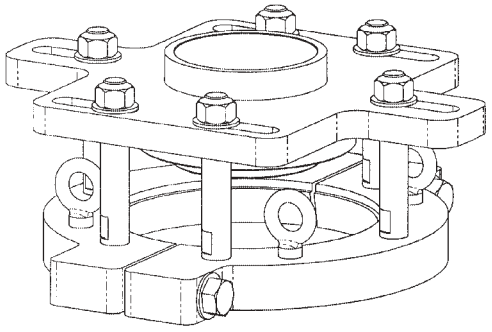
194-3725 Bearing Puller
- Removes 147-9507 Gear Heel Bearing Cone
- Used with 5P-5201 Ram, 150 Ton

194-4802 Bearing Puller
- Removes 147-9509 Gear Toe Bearing Cone
- Used with 196-0222 Ram, 100 Ton and 195-9659 Split Collar

194-4803 Bearing Puller
- Removes 147-9505 Pinion Toe Bearing Cone
- Used with 196-0222 Ram, 150 Ton

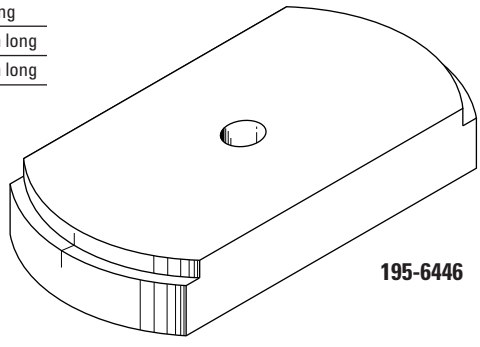
194-4804 Bearing Puller
- Removes 147-9503 Pinion Heel Bearing Cone
- Used with 196-0222 Ram, 150 Ton

195-6446 Puller Plate
- Removes 6V-0460 Pinion Toe Bearing Cup
- Used with FT2747 Receiver Sleeve, 6V-0014 Cylinder, threaded rod, and H-bar



Typical Bearing Puller

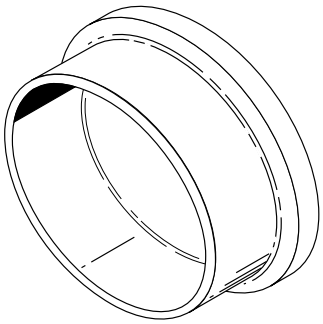
Service Parts	
Part No.	**Description**
1A-1935	Hex Nut, 1-14
4B-4285	Plain Washer, 1 inch bolt
4B-4283	Plain Washer, 3/4 inch bolt
4B-4285	Plain Washer, 1-1/4 inch bolt
5F-9338	Hex Head Cap Screw, 1-8 x 7.0 in long
1D-4616	Hex Head Cap Screw, 3/4-10 x 6.0 in long
1D-4620	Hex Head Cap Screw, 3/4-10 x 7.0 in long



195-6446

201-1112 Bearing Driver

SMCS Code: 4055-010
Model: 797 Off-Highway Trucks
Essential Tool



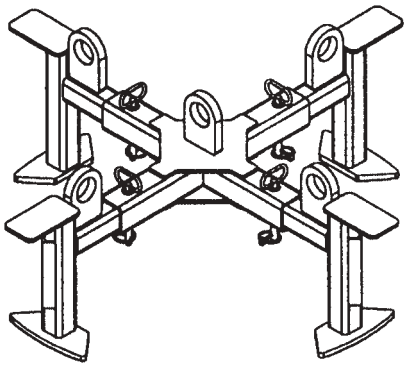
- Used to install 174-3045 First Reduction Bearing Cup in 139-7638 Planet Gear
- Used with 1U-7459 or 1U-7461 Economy Shop Press, 55 Ton
- Reduces chance of damage to bearing cup and planet gear
- Precision machined and heat treated for long durability
- 201-1116 Driver used to remove 174-3045 Bearing Cup

Reference

RENR2036 Service Manual, Powertrain Disassembly and Assembly

199-8230 Ring Gear Lifting Bracket

SMCS Code: 4055-010
Model: 797 Off-Highway Trucks
Essential Tool



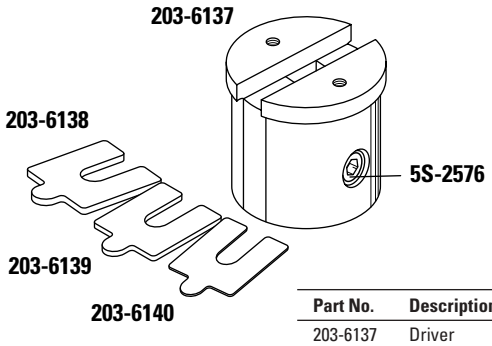
- Used to remove and install final drive ring gears
- Removes inner and outer ring gears as one single unit
- Rear wheel station must be in vertical position to use this tool
- Overall size: 865 x 865 x 470 mm (34.0 x 34.0 x 18.0 in)

Reference

RENR2036 Service Manual, Powertrain Disassembly and Assembly

201-1116 Press Driver Group

SMCS Code: 4055-010
Model: 797 Off-Highway Trucks
Essential Tool



- Made as ordered (MAO)
- Used to remove 174-3045 Bearing Cup (first reduction) from 139-7638 Planet Gear
- Used with 1U-7459 or 1U-7461 Economy Shop Press, 55 Ton
- Reduces chance of damage to bearing cup and planet gear
- Three shims provided to expand diameter of driver (allows tool to work in worn or damaged bearing cups)
- Precision machined and hardened for long durability

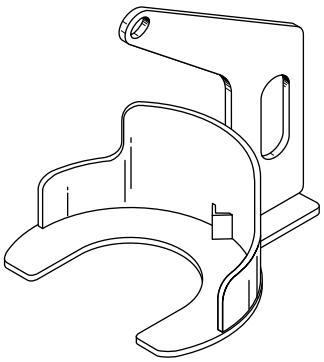
Part No.	Description
203-6137	Driver
203-6138	Shim, Thickness 2.50 mm (.098 in)
203-6139	Shim, Thickness 1.27 mm (.050 in)
203-6140	Shim, Thickness 2.5 mm (.005 in)
5S-2576	Socket Head Bolt, 3/4-10

Reference

RENR2036 Service Manual, Disassembly and Assembly\

Final Drive Planet Gear Handlers

SMCS Code: 4055-010
Model: 797 Off-Highway Trucks
Essential Tool



CE Compliant

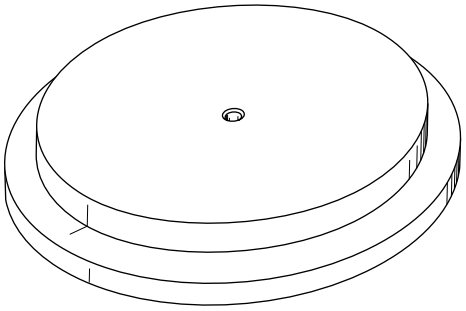
- Made as ordered (MAO)
- Used for assembly of final drive planet gears into planetary carrier
- Prevents potential handling damage to planet gears
- 199-8236 Gear Handler is used for 139-7638 1st Reduction Gear in 179-7284 Planetary Group
- 199-8235 Gear Handler is used for 139-7651 2nd Reduction Gear in 179-7285 Planetary Group

Reference

RENR2036 Service Manual, Powertrain Disassembly and Assembly

198-3488 Seal Driver

SMCS Code: 3280-014
Model: 797 Off-Highway Trucks
Essential Tool



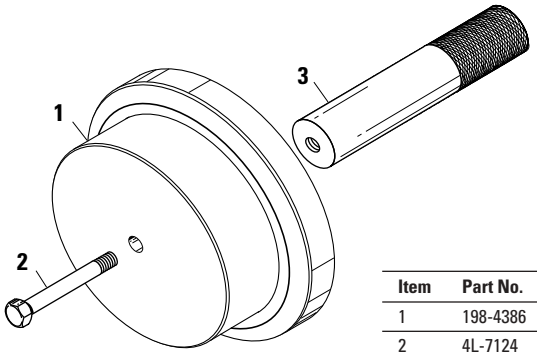
- Used to properly install 145-6048 Lip-type Seal in transmission and torque converter
- Used with 1P-0532 Handle

Reference

RENR2036, 797 Power Train Disassembly and Assembly

198-4386 Bearing Driver

SMCS Code: 3030-012
Model: 797 Off-Highway Trucks
Essential Tool



- Used to install transmission sleeve bearing
- Used with 1P-0532 Handle (part of 1P-0520 Driver Group)
- Quickly installs bearing to proper depth
- Heat-treated for added durability and long tool life

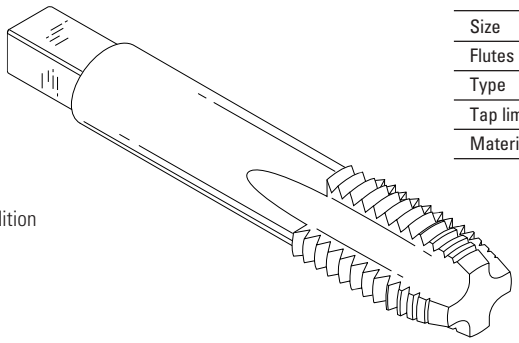
Reference

SENR2036 Service Manual, Power Train Disassembly and Assembly

Item	Part No.	Description
1	198-4386	Bearing Driver
2	4L-7124	Bolt (part of 1P-0520 Driver Group)
3	1P-0532	Handle (part of 1P-0520 Driver Group)

156-8166 Metric Tap

SMCS Code: 3253-006
Model: 797 Off-Highway Trucks
Essential Tool



Size	M22 x 1.5
Flutes	4
Type	plug
Tap limits	D6
Material	high speed steel

- Used to recondition bolt hole threads in drive shaft yoke
- Used with straight or T-handle tap wrench
- Non-standard tap quickly restores damaged or dirty threads to a like-new condition

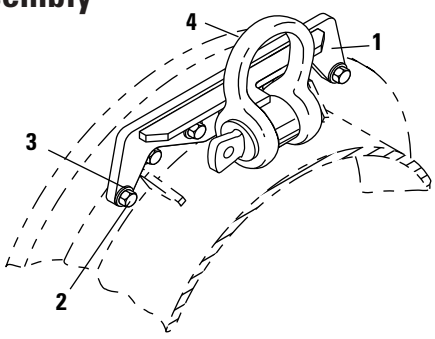
169-3687 Transmission Removal and Installation Bracket Assembly

SMCS Code: 3030-010, 3400-010
Model: 797 Off-Highway Trucks
Essential Tool

Maximum capacity	6350 kg (14,000 lbs)

CE Compliant

- Used to remove and install transmission with body attached
- Used with mobile cranes



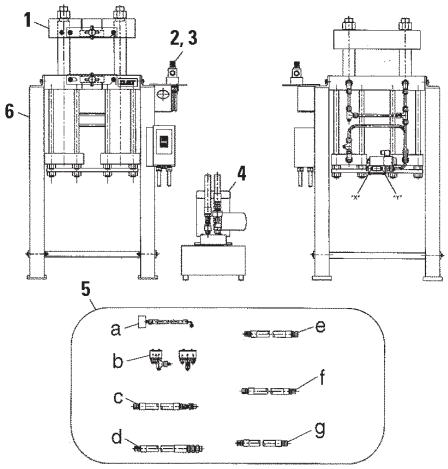
Item	Part No.	Description
1	169-3687	Transmission Removal and Installation Bracket Assembly
2	8T-0283	Hex Head Bolt
3	9X-8258	Hard Washer
	193-5475	Shackle

Lightweight Combination Hose Machine for Use on Service Trucks

SMCS Code: 0684

- Used to crimp -3 through -32 size hoses and all XT hoses
- Designed to be used in smaller, light-duty service trucks
- Stand assembly, cap end cylinder plate, and rod end cylinder plate are made from lightweight aluminum
- Approximately half the weight of standard combination hose machine
- Assembly required
- Supply voltage: 230 volt, 50 Hz, 1 phase

Item	Part No.	Description
1	168-8556	Cylinder Group
2	165-4215	Valve Group
3	165-4214	Directional Valve (part of 165-4215)
4	155-8532	Power Supply Group
5	168-8557	Hose Group
6	152-3914	Stand Assembly
Service Parts		
	155-8533	Power Supply
	152-8331	Cylinder Assembly
	165-4214	Directional Valve
	165-6055	Foot Switch
	165-6056	Directional Valve
	166-0655	Solenoid Valve



Hose	Hose size	Hose Installation Location Left Side	Hose Installation Location Right Side
Hose 5a	1.22 m (4 ft)	—	To tee on pressure port of subplate for directional valve
Plate 5b[1]	—	—	—
Hose 5c	1.83 m (6 ft), -8 DIN	To pressure port of subplate for directional valve	To pressure port of power supply
Hose 5d	1.83 m (6 ft), -8 1E0716	To "Y" side of tee on tank port of dump valve subplate	To filter on power supply
Hose 5e	1.22 m (4 ft), -8 DIN	To "B" port on subplate for directional valve	To tee on top end of cylinders
Hose 5f	1.22 m (4 ft), -8 DIN	To "A" port on subplate for directional valve	To tee on bottom end of cylinders
Hose 5g	1.22 m (4 ft), -8 1E0716	To "X" side of tee on tank port of dump valve subplate	To tank port of subplate for directional valve

[1] Subplate for directional valve

Reference

NEHS0726 Tool Operating Manual

150-2568 Hydraulic Hose Machine Group

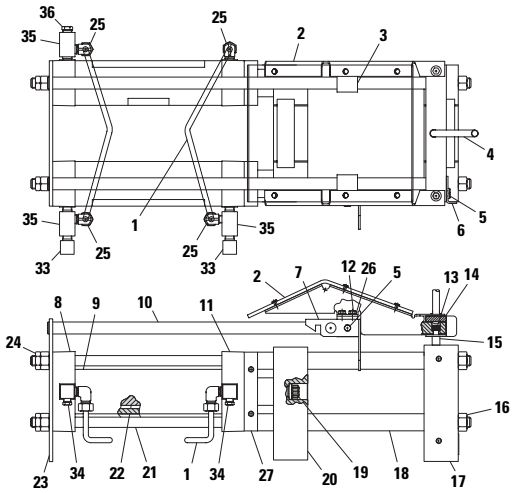
SMCS Code: 0684

Model: All XT-3, XT-5, and XT-6 Caterpillar hydraulic hose with reusable couplings. Caterpillar hydraulic hose with permanent couplings; some size limitations on permanent couplings

- Used to assemble and disassemble all sizes of XT-3, XT-5, and XT-6 reusable couplings
- Also crimps Caterpillar permanent couplings with additional 136-3642 Crimp Tool Group and appropriate crimp dies and spacer rings
- Capable of crimping 1/4 inch through 1 1/4 inch low and medium pressure hoses

Crimping Capabilities (hose diameter in inches)	
716	1/4 to 1 1/4
1E294	1/4 to 1 1/4
1E844	3/4 to 1 1/4
1E1028	3/16 to 3/4
1E2760	1/4 to 1/2
1E1543[1]	3/8 to 3/4
1E1956	3/8 to 3/4
XT-3	3/8 to 3/4
XT-5	3/4
XT-6	3/8 to 3/4

[1] 1E1543 hose is not measured by hose I.D.



Recommended Power Supplies	
1U-5555	115V, 50/60 Hz
1U-5565	230V, 50/60 Hz
4C-5080	230V, 60 Hz
171-5397	230V, 50 Hz (CE)

NOTE: A foot switch is included with each power supply listed above.

Reference

NEEG2746 Crimp Diameters Chart

NEHS0745 Assembling Reusable Couplings In the 150-2568, 150-2568, and 173-9805 XT Hose Machines

NEHS0748 Crimping Permanent Couplings Using the 136-3642 Crimp Tool Group

NEHS0749 Crimping 1E1028 Thermoplastic Hose and 1E1543 Air Conditioning Hose

NEHS0750 Comprehensive Tooling List for Assembling and Disassembling Reusable Couplings

NEHS0768 General Information for Hose Assembly

SEBF8176 Guideline for Reusable Parts and Salvage Operation: Reusable Couplings for Caterpillar XT-3, XT-5, and XT-6 Hose

Item	Part No.	Description	Qty
1	6V-4973	Oil Tube	2
2	191-6671	Shield	1
3	4C-9837	Block	2
4	1U-9681	Clamping Screw	1
5	4C-9835	Screw	2
6	4C-9834	Stop	1
7	195-3457	Latch	1
8	191-6668	Piston End Cap	2
9	191-6670	Cylinder Barrel	2
10	4C-9833	Rail	2
11	191-6667	Rod End Cap	2
12	0S-1614	Hex Head Bolt	6
13	5S-2586	Hex Stock Head Bolt	2
14	6V-4914	Clamp Bar	1
15	4C-9836	Spacer	2
16	6B-6682	Full Nut	8
17	173-9807	Front Bolster	1
18	150-2566	Spacer	4
19	1S-3794	Bolt	2

Item	Part No.	Description	Qty
20	150-2567	Rear Bolster	1
21	4C-6074	Tie Rod	4
22	191-6665	Piston Rod	2
23	4C-6079	Plate	1
24	1D-5120	Jam Nut	4
25	5P-4720	Fitting	4
26	5P-0537	Hard Washer	6
27	178-6918	Cylinder Flange	2
28	NEHS0745	Manual	1
29	NEHS0748	Manual	1
30	NEHS0749	Manual	1
31	NEHS0745	Manual	1
32	NEHS0768	Manual	1
33	135-2535	Adapter Fitting	2
34	168-3349	Pipe Plug	2
35	136-2062	Fitting Adapter	3
36	3J-5390	Pipe Plug	1
Not shown	2P-5480	Seal Kit	

1 1/2 and 2 Inch I.D. Hose Plate Selection					
DVDT	**0.00**	**2.28**	**2.64**	**3.04**	**7.93**
Pusher	134-9582	134-9582	134-9582	134-9582	134-9582
Color	BLACK	BLACK	BLACK	BLACK	BLACK
Spacer		135-4288	135-4289	135-4291	135-4290
Color		YELLOW	GREEN	RED	BLUE

Die Group and Spacer Rings for 150-2568, 7S-1100, 150-2568 and 6V-4900 Hose Machines

Crimping Die Group and DVDT Selection Chart

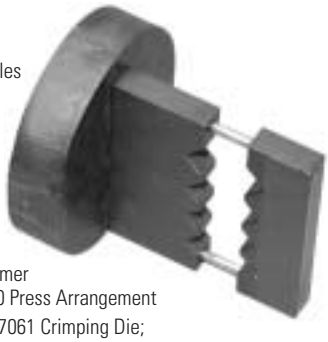
	Hose ID (mm)	**6.35**		**7.94**		**9.53**		**12.70**	
	Hose ID (in)	**1/4**		**5/16**		**3/8**		**1/2**	
	Dash No.	**-4**		**-5**		**-6**		**-8**	
	Color	**RED**		**PURPLE**		**YELLOW**		**BLUE**	
Hose Type	**Lay Line Color Type Color**	**Die Group**	**DVDT**	**Die Group**	**DVDT**	**Die Group**	**DVDT**	**Die Group**	**DVDT**
1E294	PINK BLUE	130-2185	Varies	130-2186 PINK	Varies	130-2187	Varies	130-2188	Varies
1E716	BLUE BLUE	130-2185	Varies	N.A.	N.A.	130-2187	Varies	130-2188	Varies
1E844	ORANGE BLUE	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1E1956	GREEN GREEN	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1E736 (XT-3)	YELLOW YELLOW	N.A.	N.A.	N.A.	N.A.	130-5381	0	130-5382	0
1E1036 (XT-5)	RED RED	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1E1136 (XT-6)	WHITE WHITE	N.A.	N.A.	N.A.	N.A.	130-5388	0	130-5389	0
	Hose ID (mm)	**15.88**		**19.05**		**25.4**		**31.75**	
	Hose ID (in)	**5/8**		**3/4**		**1**		**1 1/4**	
	Dash No.	**-10**		**-12**		**-16**		**-20**	
	Color	**ORANGE**		**GREEN**		**BLACK**		**WHITE**	
Hose Type	**Lay Line Color Type Color**	**Die Group**	**DVDT**	**Die Group**	**DVDT**	**Die Group**	**DVDT**	**Die Group**	**DVDT**
1E294	PINK BLUE	130-2189	Varies	130-2190	Varies	130-2191	Varies	130-2192	Varies
1E716	BLUE BLUE	130-2189	Varies	130-2190	Varies	130-2191	Varies	130-2192	Varies
1E844	ORANGE BLUE	N.A.	N.A.	130-2190	6.6	130-2191	5.4	130-2192	2.2
1E1956	GREEN GREEN	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1E736 (XT-3)	YELLOW YELLOW	130-5383	0	130-5384	0	N.A.	N.A.	N.A.	N.A.
1E1036 (XT-5)	RED RED	N.A.	N.A.	130-5386	0	N.A.	N.A.	N.A.	N.A.
1E1136 (XT-6)	WHITE WHITE	N.A.	N.A.	N.A.	N.A.	N.A	N.A.	N.A.	N.A.

Spacer Rings Selection Chart for Hose Up to 1.25 Inch I.D.

DVDT	**-0.4**	**0**	**+0.4**	**+1.4**	**+1.8**	**+2.2**	**+2.6**	**+3**	**+3.4**
Upper									134-9578
Color									RED
Lower	134-2787	134-9572	134-2788	134-9573	134-9574	134-9575	134-9576	134-9577	134-9573
Color	PURPLE	BLACK	GRAY	RED	ORANGE	YELLOW	GREEN	BLUE	RED
DVDT	**+5**	**+5.4**	**+5.8**	**+6.2**	**+6.6**	**+7**			
Upper	134-9578	134-9580	134-9580	134-9580	134-9580	134-9580			
Color	RED	YELLOW	YELLOW	YELLOW	YELLOW	YELLOW			
Lower	134-9577	134-9573	134-9574	134-9575	134-9576	134-9577			
Color	BLUE	RED	ORANGE	YELLOW	GREEN	BLUE			

6V-7061 Battery Cable Crimping Die

SMCS Code: 0684
Model: 1/0, 2/0, 3/0 and 4/0 Cable Sizes



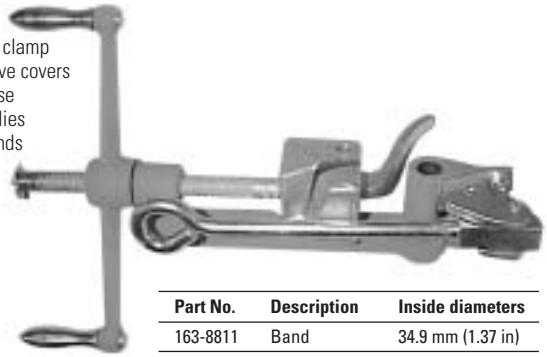
- Used with 6V-4880 Hose Press for fabrication and repair of battery cables
- Has 4 slots for crimping battery and cable terminals within size range of 1/0-4/0; each slot sized to provide proper compression when die halves are fully closed
- Can only be used in 6V-4880 Hose Press, part of 6V-4900 Hose Press Arrangement; cannot be used in former 5S-2801 Hose Press, part of 7S-1100 Press Arrangement
- 6V-7062 Repair Kit available for 6V-7061 Crimping Die; kit includes sliding die half, springs and shoulder bolts

Reference

SMHS8281 Special Instruction

166-5853 Banding Tool

SMCS Code: 0684
Warranty: Manufacturer's



- Used to clamp protective covers with hose assemblies over bands

Part No.	Description	Inside diameters
163-8811	Band	34.9 mm (1.37 in)
163-8812	Band	50.8 mm (2.00 in)
163-8813	Band	76.2 mm (3.00 in)
163-8814	Band	101.6 mm (4.00 in)

189-0990 Crimping Die Set

SMCS Code: 0684-016
Model: Current and Non-Current Caterpillar Hose Assembly Machines

- Used to crimp couplings onto 3/4 inch, dash 14 air conditioning hose
- Used with various hose machines

Material	Steel
Height	69.9 mm (2.75 in)
Diameter	102 mm (4.0 in)
Weight	2.3 kg (5 lbs)

Reference

NEHS0792 Tool Operating Manual

2P-5571 Guard Kit

SMCS Code: 0684
Model: 5S-2801 Hydraulic Hose Press Group and 7S-1100 Press Arrangement

- Replaces 1P-1850 Guard Kit
- For use with discontinued 5S-2801 Hydraulic Hose Press Group used with former 7S-1100 Press Arrangement

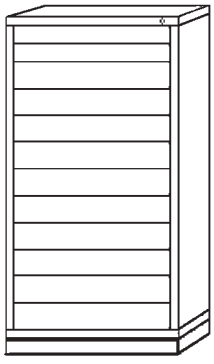
Reference

GMG00438, installation procedure

Cabinets for Low and Medium Pressure and XT Couplings

SMCS Code: 0684
Warranty: Manufacturer's (see below)

- Used to provide organized storage for hose couplings
- 12 drawer storage capacity with layout kit (provides individual pockets for each coupling size)
- Provides efficient storage and retrieval of couplings
- Overall size (w x h x d): 76 x 150 x 71 cm (30 x 59 x 28 in)
- Approximate weight: 329 kg (725 lbs)



Typical Storage Cabinet

193-4630 Cabinet Assembly (LM)

- Stores low and medium pressure couplings

193-4633 Cabinet Assembly (XT)

- Stores XT couplings

Warranty

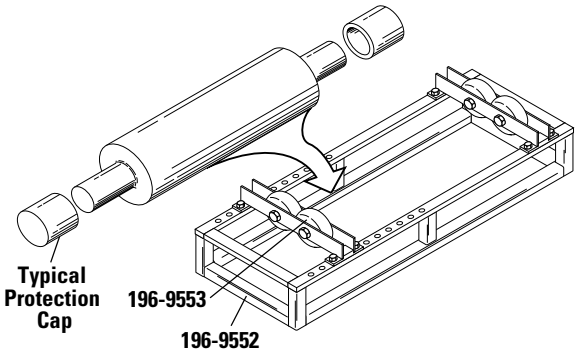
Lyon Modular Drawer Cabinets are warranted against defect in materials and workmanship for the life of the product when used in accordance with the manufacturer's specifications and operating instructions.

196-9552 Frame Assembly

Protection Caps

SMCS Code: 4158, 4159
Model: All track-type machines with idler and rollers

- Used to recondition seal ramps on inverted style roller and idler shafts to regain surface finish
- Used with protection caps and gravity fed blast machine or pressure blasting system
- Saves money—recondition rather than replace shaft
- Reconditions smooth surface to help prevent toric ring slip
- Helps prevent oil leaks which can lead to component failure
- Protection caps protect shaft's thrust face and bearing surface from blasting overspray
- Replaceable 196-9553 Wheels can be ordered separately



Part No.	Sleeve diameter	Idler	Roller
196-9554	45 mm	D4, D5H	D4, D5H, 939, 943, 953
196-9555	100 mm	D10L, D11R/N	N/A
196-9556	74 mm	D9L, D10N/R, 589	D10L, D11R/N
196-9557	68 mm	D8R/N/L, D9R/N, 578	D9L, D10N/R, 589
196-9558	58 mm	D5H, D6H/R/N, D7H/R/N, D8R/N/L, 517, 527	D6H, D7H, D9N/R 578, 579, 963, 973
196-9559	114.5 mm	N/A	D7H, D8R/N/L, D9N/R, 578, 579, 973
197-8122	96 mm	D4H, D5H	D4H, D5H, 939, 943, 953
197-8123	108 mm	D5H, D6H/R/N, 517, 527	D6H, 963
197-8124	127 mm	D7R/N/H, D8L/R/N, D9R/N, 578	D9L, D10R/L, 589
197-8125	136 mm	D9L, D10R/N, 589	D10L, D11N/R
197-8126	163 mm	D10L, D11N/R	N/A

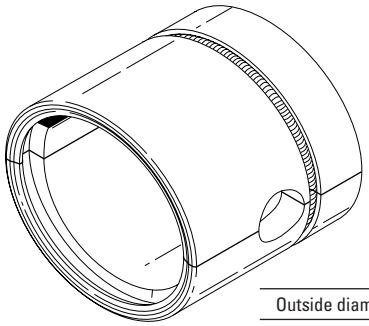
Reference

SEBF8597 Reconditioning Procedure

129-1340 Duo-Cone Seal Installer Assembly

SMCS Code: 4150-012
Model: D10N and D10R Track-Type Tractors

- Used to install Duo-Cone seal in track idler (used with 107-9621 and 125-3677 Seal Groups used in special application machines)
- Installer makes installation faster and easier, while helping to prevent seal damage (uses a 130-8364 Extension Spring to hold the two halves together)
- Using installer prevents rolling and twisting of rubber toric ring during installation



Reference

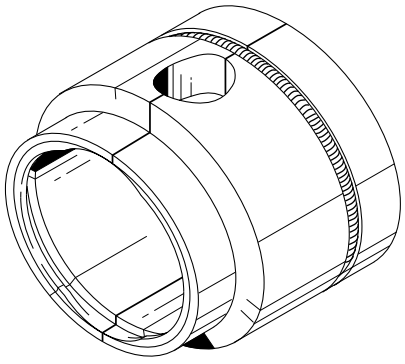
SEHS8364 Special Instruction

Outside diameter of installer	114.30 mm (4.500 in)
Outside diameter of seal	109.52 mm (4.312 in)
Overall length	102.00 mm (4.016 in)
Extension spring	130-8364

159-9843 Duo-Cone Seal Installer Assembly

SMCS Code: 4150-012
Model: Certain D11N and D11R Track-Type Tractors
Essential Tool

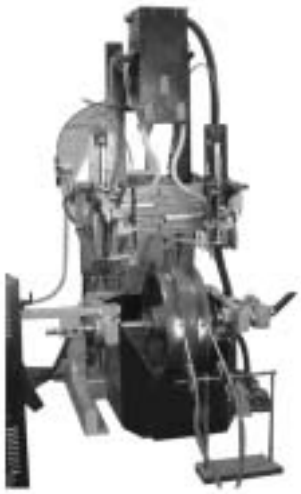
- Used to install 155-9879 Seal Group used on certain D11N and D11R Track Idler Groups
- Makes installation faster and easier
- Helps to eliminate damage, twisting, or rotation during installation



Seal diameter	137.57 mm (5.416 in)
Overall OD	158 mm (6.2 in)
Length	102 mm (4.0 in)
Shoulder OD	137.25 mm (5.404 in)

Caterpillar Idler/Roller Welder

SMCS Code: 4150
Model: All Caterpillar roller models



- Automated submerged-arc welding machine for resurfacing track idlers, rollers, and railroad rims
- Each weld head uses a dedicated power supply and automatic welder
- Three flux delivery options are available
- Chiller system for water-cooled roller welding is available separately
- Accommodates D3 through D11 idlers and rollers and 508 mm (23 in) wide railroad rims
- PLC program controls weld head motion
- 432 cm/min (170 in/min) maximum recommended wire feed rate increases production rate
- Direct drive motor/gearbox
- 45 degree yoke tilt allows flange welding
- Designed and supported exclusively by Caterpillar Service Technology Group
- Offered in any configuration of 380/460/575 Volts and 50/60 Hz

Related tooling sold separately	
Part No.	**Description**
227-1414	Track Lube Vacuum Unit
170-5664	Test and Fill Machine
Water cooling adapters for roller welding: 6V-6140 6V-6163 1U-5530	 for D9L, D10, D10N, D11N for D7H, D8N, D8L, D9N for D4H, D5H, D6H, 943-973
	Caterpillar Roller Assembly Machine (Hydraulic press for roller shaft and collar disassembly and assembly)

Ordering Information

Contact Caterpillar Dealer Service Tools Division for quotations and specifications. This product is purchased outside of the Caterpillar parts network via a Purchase Order. See Contact Information.

Reference

NEHP6023 Welding Consumables

SEBF8507-03 Undercarriage Reconditioning Guide/Water-cooled Welding

8T-3054 Disc
8T-3055 Mandrel

SMCS Code: 0674
Model: Most Caterpillar Track-type Machines

- Used to remove residual dirt and rust from track roller thread surface and flange after rollers have been cleaned in 6V-4945 Roller Buffer
- Can also be used to remove contaminants from other components such as idlers, links and roller frames
- Works faster than buffing with wire wheel
- Made of non-woven synthetic fiber impregnated with abrasive
- Should be used in pairs for greater efficiency
- Fastened to air-powered (or electric power) tool with 8T-3055 Mandrel
- Best results obtained by applying moderate pressure at speeds of 1700 to 4000 rpm

⚠ WARNING

Do not use the discs at speeds faster than 4000 rpm. The discs can break up during use. Flying pieces can cause injury. Always wear protective clothing, a face shield and gloves.

Depth Gauge Modification

SMCS Code: 4150-040
Model: Most Caterpillar Track-type Machines

- To help eliminate problems during field use of discontinued 6V-0012 and 6V-6190 Depth Gauges, use 6V-9411 Plunger and 4B-2049 Nut
- 6V-6190 Depth Gauge requires 19 plungers and nuts; 6V-0012 Depth Gauge requires 16 plungers and nuts

Item	Part No.	Description
1	6V-9411	Plunger
2	4B-2049	Nut

Application Procedure

1. Remove plastic set screws and springs from the depth gauges.
2. Place probe through vertical hole. (Probes can be easily pushed into the holes if ends are rounded.)
3. Screw 6V-9411 Plunger into threaded hole on side of gauge. Adjust plunger to the point where probe fits snug but is free to move.
4. Tighten 4B-2049 Nut over 6V-9411 Plunger while holding the plunger with a screwdriver to prevent it from turning. Probe should be able to be removed and installed without further adjustment.

10.25 Inch Pitch Tracks									
Qty.	Description RH Link	D10N PPR 7T-0715	D10, 591 PPR 9W-5933	D9H, 594 S&LT 9S-1927	D10N S&LT 9W-5265	D10 S&LT 9G-5507	D10 S&LT 9W-5723	D9, 245 Sealed 9S-1927	375 Sealed 6Y-6721
1	Saddle	9U-7768	9U-7768	9U-7768	9U-7768	9U-7768	9U-7768	206-3087	9U-7768
2	Pin As. Base	9U-7580	9U-7580	9U-7581	9U-7582	9U-7583	9U-7583	9U-7584	9U-7581
2	Pin As. Body	9U-7585	9U-7585	9U-7585	9U-7585	9U-7585	9U-7585	9U-7585	9U-7585
1	Pin As. Plunger[1]	9U-7578	9U-7578	9U-7578	9U-7578	9U-7578	9U-7578	9U-7578	9U-7578
1	Pin As. Plunger[2]	9U-7579	9U-7579	9U-7579	9U-7579	9U-7579	9U-7579	9U-7579	9U-7579
2	Bush As. Base	9U-7575	9U-7575	9U-7576	9U-7575	9U-7575	9U-7575	9U-7575	9U-7575
2	Bush As. Body	9U-7577	9U-7577	9U-7577	9U-7577	9U-7577	9U-7577	9U-7577	9U-7577
2	Bush As. Plunger	9U-7572	9U-7573	9U-7574	9U-7572	9U-7573	9U-7573	9U-7574	9U-7574
2	Pin Disassembly	9U-7779	9U-7779	9U-7779	9U-7779	9U-7779	9U-7779	9U-7779	9U-7779
2	Bush Disassembly	9U-7780	9U-7780	9U-7780	9U-7780	9U-7780	9U-7780	9U-7780	9U-7780
2	Extruder Assembly	198-5342	198-5342	—	—	—	—	—	—
2	Anvil Assembly	8T-3216	8T-3216	—	—	—	—	—	—
2	Stud	1U-6257	1U-6257	—	—	—	—	—	
2	Handle Assembly	8T-3211	8T-3211	—	—	—	—	—	—
1	S.R. Master Adapter	—	—	—	9U-7781	9U-7781	9U-7781	—	—
1	Link Spacer	—	—	—	—	—	—	9U-7795	9U-7794
8	Socket Head Screw	9F-5975	9F-5975	9F-5975	9F-5975	9F-5975	9F-5975	9F-5975	9F-5975
4	Jam Nut (100/Pkg)	1B-2578	1B-2578	1B-2578	1B-2578	1B-2578	1B-2578	1B-2578	1B-2578
4	Spring	9U-7746	9U-7746	9U-7746	9U-7746	9U-7746	9U-7746	9U-7746	9U-7746
4	Set Screw	5B-0448	5B-0448	5B-0448	5B-0448	5B-0448	5B-0448	5B-0448	5B-0448
1	Spacer Group	126-4041	126-4041	126-4041	126-4041	126-4041	126-4041	126-4041	126-4041
2	Unloading Pin	157-8547	157-8547	—	—	—	—	—	—

[1] First Assembly Side

[2] Other Side

9.45 Inch Pitch Tracks			
Qty.	Description R.H. Link	D9N PPR 7T-2275	DD9N S&LT 9W-2743
1	Saddle	9U—7769	9U-7769
2	Pin As. Base	9U-7830	9U-7600
2	Pin As. Body	9U-7605	9U-7605
1	Pin As. Plunger[1]	9U-7595	9U-7595
1	Pin As. Plunger[2]	9U-7596	9U-7596
2	Bush As. Base	9U-7592	9U-7592
2	Bush As. Body	9U-7594	9U-7594
2	Bush As. Plunger	9U-7589	9U-7589
2	Pin Disassembly	9U-7782	9U-7782
2	Bush Disas.	9U-7783	9U-7783
2	Extruder Assembly	198-5343	—

9.45 Inch Pitch Tracks			
Qty.	Description R.H. Link	D9N PPR 7T-2275	DD9N S&LT 9W-2743
2	Anvil Assembly	8T-3216	—
2	Stud	1U-6257	—
2	Handle Assembly	8T-3211	—
1	S.R. Master Adapter	—	9U-7784
8	Socket Head Screw	9F-5975	9F-5975
4	Jam Nut (100/pkg.)	1B-2578	1B-2578
4	Spring	9U-7746	9U-7746
4	Set Screw	5B-0448	5B-0448
1	Spacer Group	126-4041	126-4041
2	Unloading Pin	157-8547	—

[1] First assembly side

[2] Other side

Clamps for Shipping and Storage of Track Assemblies

SMCS Code: 0661
Model: See Chart

- 8 clamps (10 on track groups for D10 and D11N Tractors) are equally spaced in sets of 2 around rolled track groups to keep them together during shipping and storage
- Use chart to find correct size and length of threaded rod to use with each clamp and track shoe width; order two clamps for each set required; threaded rod, nuts, and washers not included

Typical Track Clamp

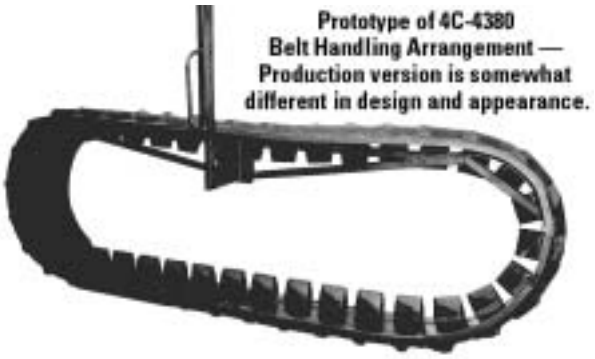
Machine Model	Standard Track Shoe Width	Threaded Rod Length	Rod Diameter	Clamp[1]
D11N	711 mm (28 in)	457 mm (18 in)	20 mm (.750 in)	9A-0436
D10N	610 mm (24 in)	356 mm (14 in)	20 mm (.750 in)	9A-0436
D10	711 mm (28 in)	457 mm (18 in)	20 mm (.750 in)	9A-0436
D9N	610 mm (24 in)	356 mm (14 in)	20 mm (.750 in)	9A-0436
D9L	610 mm (24 in)	356 mm (14 in)	20 mm (.750 in)	9A-0436
D9H	610 mm (24 in)	356 mm (14 in)	20 mm (.750 in)	9A-0436
D8N	559 mm (22 in)	381 mm (15 in)	20 mm (.750 in)	9A-0437
D8L	559 mm (22 in)	381 mm (15 in)	20 mm (.750 in)	9A-0437
D8K	559 mm (22 in)	381 mm (15 in)	20 mm (.750 in)	9A-0437
D7H	559 mm (22 in)	381 mm (15 in)	20 mm (.750 in)	9A-0437
D7G	508 mm (20 in)	305 mm (12 in)	16 mm (.625 in)	9A-1541
D6H	559 mm (22 in)	381 mm (15 in)	20 mm (.750 in)	9A-0437
D6D	457 mm (18 in)	254 mm (10 in)	16 mm (.625 in)	9A-1541
D5H	406 mm (16 in)	305 mm (12 in)	16 mm (.625 in)	9A-1542
D5B	406 mm (16 in)	305 mm (12 in)	16 mm (.625 in)	9A-1542
D4H	356 mm (14 in)	254 mm (10 in)	20 mm (.750 in)	9A-1542
D4E	406 mm (16 in)	305 mm (12 in)	16 mm (.625 in)	9A-1542
D3B	305 mm (12 in)	203 mm (8 in)	16 mm (.625 in)	9A-1542
227	711 mm (28 in)	508 mm (20 in)	16 mm (.625 in)	9A-1541
245	762 mm (30 in)	508 mm (20 in)	20 mm (.750 in)	9A-0436
235	762 mm (30 in)	559 mm (22 in)	16 mm (.625 in)	9A-1541
225	559 mm (22 in)	457 mm (18 in)	16 mm (.625 in)	9A-1542
215	508 mm (20 in)	406 mm (16 in)	16 mm (.625 in)	9A-1542
973	508 mm (20 in)	305 mm (12 in)	20 mm (.750 in)	9A-1541
963	457 mm (18 in)	254 mm (10 in)	20 mm (.750 in)	9A-1541
953	381 mm (15 in)	279 mm (11 in)	20 mm (.750 in)	9A-1542
943	356 mm (14 in)	254 mm (10 in)	20 mm (.750 in)	9A-1542
931B	305 mm (12 in)	203 mm (8 in)	20 mm (.750 in)	9A-1542

[1] Order 2 clamps for each set required.

4C-4380 Belt Handling Arrangement

SMCS Code: 4198-010
Model: Challenger 65, 75 and 85 Tractors

- Primary use is to remove and install rubber belted track; secondary use is to remove and install outer drive and idler wheels; only C-hook portion of tool, along with an included adapter, is required for latter operation
- One-man operation
- Can be disassembled for easy transportation and storage
- Height of machine off ground not critical



Prototype of 4C-4380 Belt Handling Arrangement — Production version is somewhat different in design and appearance.

Hydrostatic Pump and Track Installation Tools

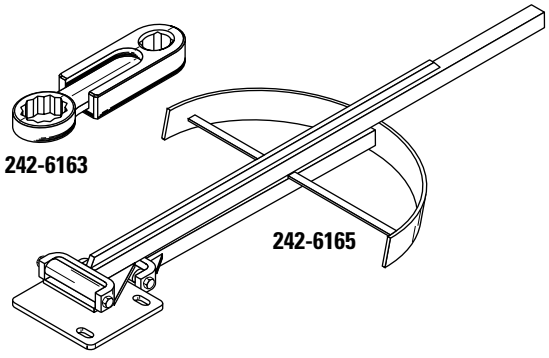
SMCS Code: 4198-012
Model: 287 and 287B Multi-Terrain Loader

242-6163 Hex (Extension) Wrench

- Used to remove hydrostatic pump assembly mounting bolts
- 24 mm hex end wrench with 1/2 inch square drive
- 76.2 mm (3.00 in) center-to-center distance from drive to socket

242-6165 Track Installer Assembly

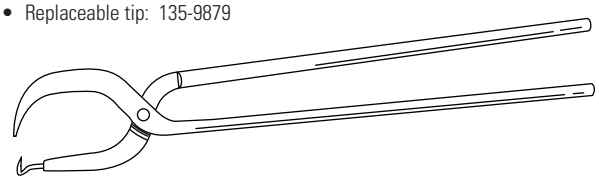
- Used to install rubber tracks
- Significantly reduces installation time and effort



135-9811 Brake Spring Pliers

SMCS Code: 4253-010
Model: M312 Wheeled Excavators

- Used to remove and install extra-heavy brake springs
- Replaceable tip ensures long tool life
- Overall length: 66 cm (26.0 in)
- Replaceable tip: 135-9879



9S-9149 Bleeder Wrench

SMCS Code: 1006-010, 3258-010, 4254-010, 4256-010, 4258-010, 7051-029
Model: 920, 930 Wheel Loaders

- Used to bleed wheel brake hydraulic system

Steering Lines Adapter Tools

SMCS Code: 4302-552
Model: 631B, 641, 651 and 657 Tractors

- Used on tractors with steering swivel joints
- Makes it possible to tow a tractor-scraper unit with tractor wheels on lowboy and scraper wheels on the ground
- A junction block (part of steering lines adapter group) is bolted to swivel joint with steering cylinder lines bolted to junction block; junction block permits hydraulic steering oil to flow freely between steering cylinders

Part No.	Description	Quantity
1B-5174	Plug	
4J-7570	Block	
4F-7226	Bolt	4
3B-4507	Lockwasher	8
3H-5368	Bolt	4
3H-5368	Bolt	4
4J-0522	Seal (Not shown)	4

8S-3612 Thread Protector

SMCS Code: 4329-011
Model: 769 Truck

- Used to unseat ball stud tapers when removing tie rod from steering arms
- With protector installed, hammer can be used against protector to unseat ball stud tapers

5P-0167 Brake Spring Tool

SMCS Code: 4253-010, 4261-010, 5052-017
Model: 621E, 623B, 627E,631D, 631E, 633D, 637D, 651E

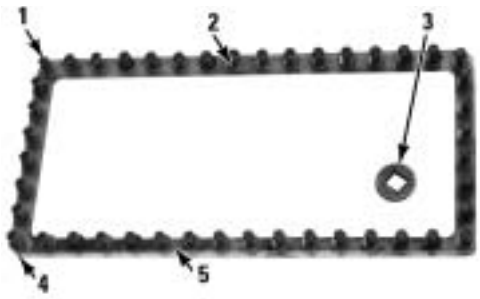
- Easy, safe device for installing brake springs on wheel tractor-scrapers
- Socket end used for spring removal; hook end used for spring installation

1P-3519 Transparent Cover

SMCS Code: 5056-036
Model: 955K, 977K, or 983 Traxcavators

- Clear plastic cover useful in determining source of leaks in hydraulic tanks

Item	Part No.	Description
1	0S-1591	Bolt (44 required)
2	5M-2894	Washer (44 required)
3	4B-2363 6F-4868	Plug Gasket
4	5J-5160	Gasket
5	1P-3519	Cover



Fittings for 7/8 inch J.I.C. Connectors

SMCS Code: 5086-036
Model: Wain-Roy Backhoe

- 9S-0176 Tee and 9S-0177 Union used for tapping into 7/8 inch J.I.C. connectors on Wain-Roy Backhoes to check pressure relief valve settings

Item	Part No.	Description
1	9S-0177	Union
2	9S-0176	Tee

Portable Hydraulic Tester

SMCS Code: 3000-032, 5000-032
Model: All Models Including E and MS Series Excavators
Warranty: Manufacturer's

- Used to test hydraulic flow, pressure, and temperature in any hydraulic system (used in field or shop by simulating system working conditions)
- Range and versatility extended with use of externally connected flow meters (coupled with 4C-9438 Cable)
- Troubleshoot or adjust hydraulic circuits at low or high flows ("Interpass" protection prevents dangerous external oil spray in event of over-pressure)
- Unit is self contained and bi-directional (easily installed into hydraulic circuit using hoses and quick disconnects)
- Uses 6V-3136 Photo Pickup and 6V-2198 Cable, saving tool accessory costs
- Uses standard batteries with automatic power-off feature
- Use 9U-5229 Adapter or 9U-5228 Adapter to reduce ports to 1 5/8 inch or 1 5/16 inch STOR (Straight Thread O-Ring) respectively [makes a close-coupled connection with 41 000 kPa (6000 PSI) pressure rating]

4C-9910 Portable Hydraulic Tester	
Flow Range	13 to 475 L/min (3.5 to 125 gpm)
Digital readout scales	metric, U.S. or British
Accuracy	±1% full scale over normal range
Analog output	0 to 1.5 Volt DC = 0 to 475 L/min (0 to 125 gpm)
External input socket for flow meters	0.2 to 795 L/min (0.05 to 210 gpm) range
Continuous working pressure (analog readout)	0 to 500 Bar (0-6800 PSI)
Pressure accuracy	±1.6% full scale
Temperature (analog readout)	10 to 120°C (50 to 250°F)
Temperature accuracy	±1°C (±2°F)
Speed	0 to 6000 rpm (digital readout)
Accuracy	±1% full scale
Ports	1 7/8-12 UNF SAE O-ring
4C-9911 Flowmeter (typical)	
Flow accuracy	±1% full scale of normal range; ±2% full scale of extended range
Temperature	10 to 120°C (50 to 250°F)
Temperature accuracy	±1°C (±2°F)

Hydraulic Implement System — C							
Machine Model	C-1	C-2	C-3	C-4	C-5	C-6	C-7
D3		1			1		
D7G		1					
D8K		1					
D9H		1					
D10L		1					
814		1					
815		1					
816		1					
824		1					
825B		1					
826B		1					
834		1					
835		1					
931					1		
941		1					
943,953						1	1
951		1					
955		1					
977		1		[1]			

Hydraulic Implement System — C							
Machine Model	C-1	C-2	C-3	C-4	C-5	C-6	C-7
983		1					
518		1					
528		1					
910					1		
920		1					
930		1					
950		1					
966		1	[1]				
980		1					
988	[1]	1					
992	[1]	1					
120G		1					
130G		1					
140G		1					
12G		1					
14G		1					
16G		1					
215							1
245		1					

[1] Required on early machines without "Tee Taps."

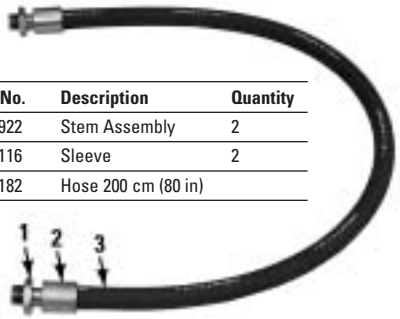
Steering Systems — A-1 thru A-11					
Machine Model	A-1	A-2	A-4	A-7	A-11
920		1			
930		1			
966		1			
988	1				
992C				1	
814		1			
815		1			
816		1			
621B					1
623B					1
627B					1
631D					1
633D	1				
637D					1
528			1		

Steering Systems — B thru C			
Machine Model	B-6	B-9	C-2
920	1		1
930	1		1
966	1		1
988	1		1
992C	1		
814			1
815			1
816			1
621B	1		
623B	1		
627B	1		
631D	1		
633D	1		
637D	1		
528		1	1

2P-2349 Hose Assembly

SMCS Code: 5050-038
Model: See Tee Test Tool Charts

- Has nearly doubled pressure capability of 8B-2496 Hose Assembly which it replaced
- Used to make up connecting hose assemblies as indicated in Tee Test Tool Chart; can be assembled from components listed



Item	Part No.	Description	Quantity
1	2P-0922	Stem Assembly	2
2	3S-7116	Sleeve	2
3	5P-0182	Hose 200 cm (80 in)	

2P-2337 Large Box
2P-2339 Tee Test Tool Kit

SMCS Code: 0784
Model: Most Caterpillar Models
Warranty: One Year

- Smaller 2P-2339 Box has polyethylene inserts with contours to closely contain 9S-2000 Flow Meter, tachometer drives, blocking plate assemblies and tool bits
- Larger 2P-2337 Box designed to hold all recommended pump supply line adapters, connecting hose assemblies and return line assemblies for Caterpillar flow meters
- Handles provided on both boxes to facilitate carrying
- Boxes sealed against dirt entry

242-7135 Test Kit

SMCS Code: 5050-081, 5050-038, 7562-082, 1000-036, 4250-081, 4300-036, 4250-038, 4300-038, 5301-010, 4250-032
Model: All Caterpillar Oil Coolers
Essential Tool

- Used to test all Caterpillar oil coolers for leaks
- Prevents unnecessary oil cooler replacement

Part No.	Description
210-6990	Digital Pressure Gauge
4C-7056	Hose
4C-8858	Coupler
6V-7145	Case
1P-3703	Seal, 38.66 mm outside diameter
1P-3704	Seal, 44.75 mm outside diameter
1P-3708	Seal, 64.2 mm outside diameter
8T-2885	Seal, 83.4 mm outside diameter
NEEG2976	Decal

Reference

REHS1758 Test Procedure

6V-0102 Flushing Adapter

SMCS Code: 5050-046
Model: 245 Excavator

- Required for flushing stick cylinder
- Has 3 interconnecting ports so that a loop of 3 hoses can be connected to the three ports on stick cylinder

Flowmeters

SMCS Code: 5050-082, 3150-038, 5050-038
Model: Most Caterpillar Models

- Low cost flowmeters for measuring hydraulic flow in applications within their capacities
- Similar to 6V-7788 Flowmeter; all 3 flowmeters incorporate a variable orifice which measures line flow with less restriction (pressure drop) than 5P-3600 Flowmeter
- Can be installed in any position and are not affected by shock or vibration

Part No.	Description	Range	Maximum Pressure	Length	Inlet/outlet Connections
8T-0454	Flowmeter	20 to 200 liters/min (5 to 50 GPM)	20 700 kPa (3000 PSI)	approx. 300 mm (12 in)	1 1/4 inch NPT
8T-0456	Flowmeter	50 to 550 liters/min (10 to 150 GPM)	20 700 kPa (3000 PSI)	approx. 300 mm (12 in)	1 1/4 inch NPT

Tools needed for checking transmission cooler flow on 943, 953, 963 and 973 Track-Type Loaders

Item	Part No.	Description
1	8T-0454	Flowmeter
2	1P-5598	Pipe Nipple, 1 1/4 inch NPT
3	1Y-7453	Tee
4	9B-3523	Reducing Bushing
5	6V-3966	Nipple
6	6V-4144	Coupler
7	8T-0854	Gauge 9-1000 kPa (1-150 PSI)
8	8F-8306	Reducing Bushing, 1 1/4 inch NPT to 3/4 inch NPT (2)
9	4S-6678	Flared Connector, 37° (2)[1]
10	9D-9262	Hose[1]
11	6K-3459	Flared Connector, 37° (2)[2]
12	134-8416	Hose[2]

[1] Use for 943 and 953
[2] Use for 963 and 973

1U-5525 Attachment Group for Discontinued 1U-5000 Auxiliary Power Unit

SMCS Code: 1401-045, 7000-552, 7000-555
Model: 785, 789 Off-Highway Trucks
Warranty:

- Contains all hydraulic fittings, hoses, and electrical cables to connect 1U-5000 to either the 785 or 789

Reference

SEHS8880 Special Instruction

Service Parts		
Part No.	**Description**	**Quantity**
1U-5484	Hose Assembly	1
1U-5485	Hose Assembly	2
1U-5486	Connector Assembly	1
1U-5489	Plug Assembly	1
1U-8331	Conversion Group	1
1U-8330	Hose Assembly	1
1U-5772	Gauge Assembly	1
1U-5552	Shipping Case	1
8S-2632	Battery Connection Cable Plug Assembly	1

4C-4441 Relief Valve Tester

SMCS Code: 0784
Model: Most Caterpillar Models

- Used to test hydraulic cartridge relief valves for proper cracking pressure
- If valve is in normal working order, it can be adjusted to specifications
- Do not provide full flow testing, but do provide excellent system for determining pressure setting of cartridge relief valves
- 4C-4441 Relief Valve Tester can be connected to 208, 220, 380, 440, 575 or 600 volt 3 phase 50-60 Hz electrical power
- Power source must be able to operate 3-horsepower electric motor
- Hydraulic reservoir requires 5 gallons of Mobile DTE11 to simulate hot run conditions in vehicle
- Self-contained unit with high pressure hydraulic pump capable of 7200 PSI
- 0-500 PSI differential pressure gauge used to indicate flow; 7500 PSI pressure gauge used to indicate actual set point of relief valve being tested; adjustable relief valve used to provide different pressures needed to test each relief valve
- Relief valve tester uses several different manifolds, depending on relief valve; 1U-9887 Nipple used to connect manifold to tester; manifolds and nipples not provided with relief valve tester

Reference

NEHT6031 Test Procedure, test procedures and specifications for 1U-8900 Relief Valve Tester

Part No.	Description
1U-7770 Manifold	
9T-1430	Relief Valve
9T-5364	Relief Valve
9T-3541	Relief Valve
9T-1043	Relief Valve
9T-1466	Relief Valve
1U-5216 Manifold	
9T-0704	Relief Valve
9T-0705	Relief Valve
9T-1465	Relief Valve
9T-1466	Relief Valve

Part No.	Description
1U-9353 Manifold	
4T-1039	Relief Valve
4T-0947	Relief Valve
9T-0491	Relief Valve
1U-9354 Manifold	
9T-5880	Relief Valve
9T-5911	Relief Valve
9T-5572	Relief Valve
1U-9355 Manifold	
4T-6067	Relief Valve
4T-7599	Relief Valve
4T-4740	Relief Valve
4T-9949	Relief Valve

Part No.	Description
1U-9356 Manifold	
4T-7290	Relief Valve
9T-4111	Relief Valve
1U-9357 Manifold	
9T-0121	Relief Valve
9T-9011	Relief Valve
1U-9358 Manifold	
4T-2531	Relief Valve
4T-2742	Relief Valve
4T-4935	Relief Valve, H-Series

Relief Valve Manifolds

SMCS Code: 4322-025, 5117-036
Model: Challenger 65, 65B, and 75 and D8N Track-Type Tractor

- Used to test and adjust cartridge type relief valves
- Used with 1U-8900 Cartridge Relief Valve Tester and 4C-4441 Cartridge Relief Valve Tester
- Greatly simplifies testing—significantly reduces time spent testing each relief valve
- Each manifold has two separate ports; both ports have independent pump and tank connections
- Length x Width x Height: 127 mm (5.0 in) x 50 mm (2.0 in) x 101 mm (4.0 in)
- Weight: 5 kg (11.0 lbs.)

Typical Relief Valve Manifold

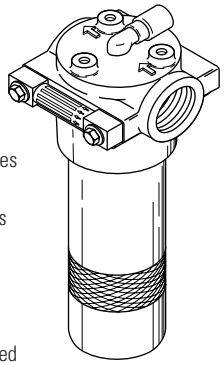
Reference

NEHT6031 Test Procedure

9U-5785 Relief Valve Manifold	
One port tests	9T-4892 High Pressure Relief Valves used in the differential steering pump on Challenger 65, 65B, and 75
Other port tests	Pump-mounted 9T-4893 Charge Pressure Relief Valves on Challenger 65
9U-5829 Relief Valve Manifold	
One port tests	6E-3578 Steering Pump Charge Pressure Relief Valves used in Challenger 65B and 75
Other port tests	Pump-mounted 6E-4346 Cross Over Relief Valves in the differential steering pump on D8N Track-Type Tractors

192-6432 Filter

SMCS Code: 5068
Model: All Caterpillar Service Vehicles
Warranty: Manufacturer's



- Used to filter oil in high-volume applications
- Provides extended time between element changes
- Uses synthetic fiber filter elements
- Filter head is made of cast aluminum and bowl is made of steel for strength and durability
- Visual dirty element indicator shows when to change element
- Elements contain no metal
- Elements can be incinerated, crushed, or shredded

Working pressure	9650 kPa (1400 PSI)
Burst pressure	27573 kPa (4000 PSI)
Nominal flow	64 lpm (17 gpm)
In/out ports	SAE #12
Dirty element indicator	pop-up style
Material	aluminum head, steel housing with 3 micron cellulose media
Overall dimension	239 x 89 mm (9.4 x 3.5 in)
Weight	1.4 kg (3.0 lb)
Body-style	canister

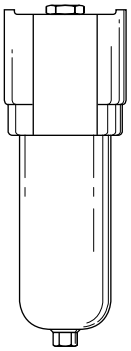
Cartridge Elements for 192-6432 Filter Group

Nominal Micron Rating	Media Material	Dirt Holding Capacity	Height and Diameter	Part No.
3	Cellulose	10.5 grams	6 inch (150 mm) 2 inch (50 mm)	192-6433
5	Cellulose	12 grams	6 inch (150 mm) 2 inch (50 mm)	226-5492
10	Cellulose	14 grams	6 inch (150 mm) 2 inch (50 mm)	226-5493

249-2931 Filter Housing and Elements

SMCS Code: 5068
Model: All Caterpillar Service Vehicles

- Used to provide no-bypass filtering of hydraulic oils
- Used in service bays with drop-down oil lines or any other application requiring filtered, petroleum-based oil
- Non-collapsible filter elements work well with higher viscous hydraulic oils
- Filter head is made of cast aluminum with steel bowl for strength and durability



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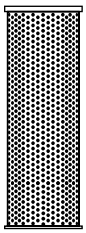

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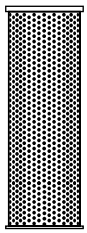


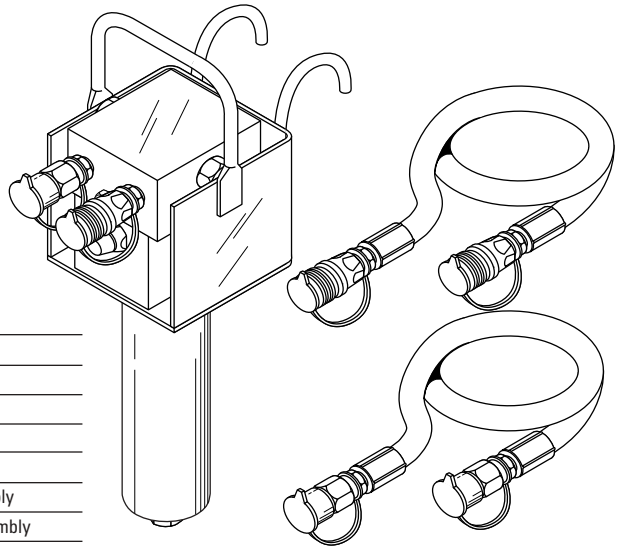
249-2933

Filter Head	
Body-style	canister
Mounting holes	5/16-18
Inlet and outlet ports	3/4 NPT
Operating temperature range	-29 to 107°C (-20 to 225°F)
Material	aluminum head with steel housing
Overall size	90 mm (3.5 in) square x 238 mm (9.4 in) long
Filter Elements	
249-2932 Filter Element	10 micron
249-2933 Filter Element	24 micron
Filter media	synthetic
Overall size	50 mm (2.0 in) diameter by 150 mm (6.0 in) long
Collapse rating	206.8 BAR (3000 PSI)

Kidney Loop Group for Mini Hydraulic Excavator

SMCS Code: 5050, 5095
Model: Mini Hydraulic Excavators

- Used to kidney loop a hydraulic system
- Also used to filter hydraulic oil returning from detachable work tools
- Hoses attach to a rectifier head which allows input flow from either port
- Hoses are equipped with either two 6W-2888 or two 6W-2889 Quick-Disconnect Couplings on each hose
- Designed with a handle for easy carrying; hooks make it easy to hang filter on a machine near work area
- Comes with 225-3116 Filter Element (3 micron)
- Optional 225-3115 Filter Element (6 micron) can be purchased separately



Weight of filter unit	16.78 kg (37 lbs)
Weight of hose assembly (each)	3.54 kg (7.8 lbs)
Hose lengths	122 cm (48 in)
Maximum working pressure rating	41,368 kPa (6000 PSI)
Maximum flow rating	181.7 L/min (48 gpm) at 248 kPa (36 PSI)

Part No.	Description
225-3114	Filter Group
225-3115	Filter Element
225-3116	Filter Element
Service Parts	
6W-2888	Nipple Assembly
6W-2889	Coupling Assembly
6V-0408	Bonded Seal
225-3115	Filter Element (3 micron)
225-3116	Filter Element (6 micron)

Piston Spanner Assemblies

SMCS Code: 7201-017, 4303-017
Model: D25C and D, D30C and D, D35C and HP, D40D, D44B, D250B, D300B and D, D350C and D, D400, D400D, D550B Articulated Trucks

- Used to remove and install pistons on cylinder rods
- Used with 3/4 inch square drive torque wrench, ratchet, or breaker bar
- Quick and easy assembly and disassembly
- Maintains positive engagement and eliminates damage to rod surface
- Saves part replacement costs by eliminating damage by destructive methods such as cutting torch or welding

9U-6110 and 9U-6111 Spanner Wrenches

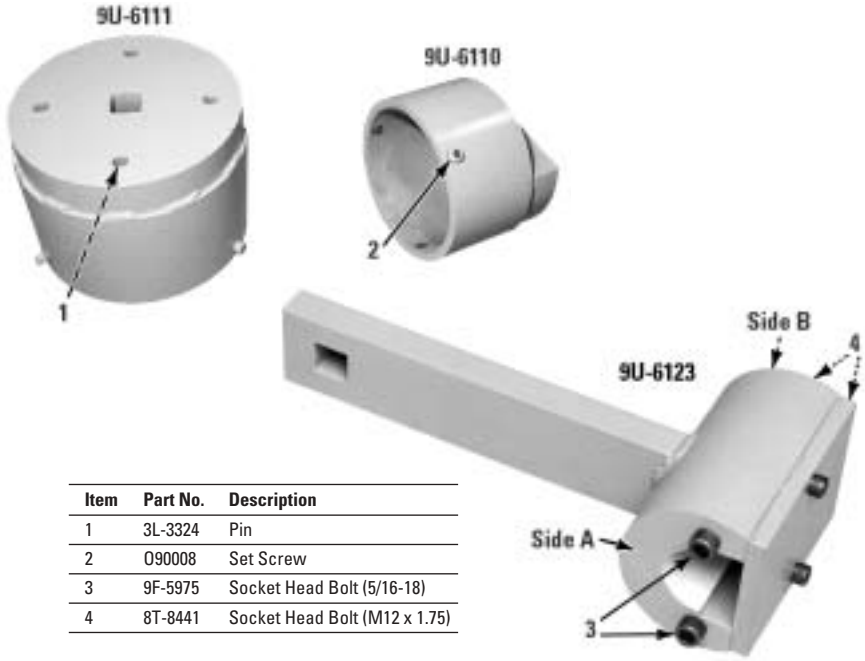
- Used to remove and install threaded pistons in 6U-3247 and 5U-6864 Suspension Cylinders
- Pins inside of tool provide positive non-slip engagement during torqing (using standard adjustable-type spanner is ineffective and usually results in damaged rod or piston)
- "Tubular" design provides slip fit around piston; three set screws also provide assurance wrench will not become disengaged during tightening or loosening

9U-6123 Spanner Wrench

- Used to remove and install threaded pistons in 6U-7243 and 7U-8421 Steering Cylinders
- Fits pistons with spanner holes on "board" side (facing rod eye)—these pistons are very difficult to service with standard adjustable type spanner wrenches
- C-type design fits around cylinder rod and is held in place with cover plate
- Inside surfaces covered with non-metallic covering to protect 50 mm (2.0 in) cylinder rod during rotation
- Spanner pins on each end provide service for two different pistons having different spanner requirements (Side A for 7U-8421 Piston and Side B for 6U-7243 Piston)
- When assembled onto cylinder rod, bearing-type design of inside diameter virtually eliminates chance of disengagement

Part No.	Description	Inside Diameter	Depth	Width	Length (to end of handle)	Number of Pins	Pin Size	Bolt Circle of Pins	Weight	Square Drive Size
9U-6110	Spanner	101.6 mm (4.00 in)	61 mm (2.4 in)	—	—	2	3L-3324 Pin; 9.50 mm (.375 in)	72.00 mm (2.834 in)	2 kg (4.5 lbs.)	3/4 in
9U-6111	Spanner	139.7 mm (5.50 in)	84 mm (3.1 in)	—	—	4	3L-3324 Pin; 9.50 mm (.375 in)	106.00 mm (4.173 in)	5 kg (11.5 lbs.)	3/4 in
9U-6123	Spanner	cylinder rod size, 50.8 mm (2.00 in)	—	152 mm (6.0 in)	400.0 mm (15.75 in)	two per side	9F-5975 (Side A) 12.0 mm (.47 in) 8T-8441 (Side B) 18.0 mm (.71 in)	(Side A) 77.00 mm (3.031 in) (Side B) 78.00 mm (3.071 in)	—	—

Spanner Wrench Usage Chart			
Spanner Wrench Part	9U-6110	9U-6111	9U-6123
Piston Serviced	6U-3247	5U-6864 7U-8421	6U-7243
Type Cylinder	Susp.	Susp.	Steering
Vehicle Models	D250B D35C D25C		
	D300B D300D	D35HP D40D	D25D D250B
		D44B D550B	D30C D30D D300B
			D300D D35C D35HP
			D350C D350D D40D
			D400 D400D



Item	Part No.	Description
1	3L-3324	Pin
2	O90008	Set Screw
3	9F-5975	Socket Head Bolt (5/16-18)
4	8T-8441	Socket Head Bolt (M12 x 1.75)

Reference

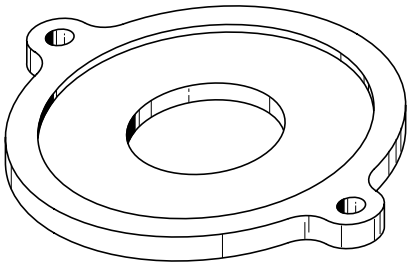
SENR8220 Service Manual; D300D Vehicle Systems Disassembly and Assembly

Plate Assemblies

SMCS Code: 5070-016
Model: Caterpillar Designed Hydraulic Piston Pumps

- Plate assembly holds rotating group, swashplate, and shaft together as one unit while removing or installing this assembly from/into the pump housing
- Bolt plate assembly in place using two customer-supplied bolts and washers

Part No.	Description	Application	Center Distance Between Bolt Holes
129-1027	Plate Assembly	180 cc pump	172.0 mm (6.77 in)
129-1028	Plate Assembly	250 cc pump	188.7 mm (7.42 in)



5P-2390 Gauge Tool Group

SMCS Code: 3108-017, 3108-025, 4150-010, 4150-012, 3108-016, 3103-017, 3100-017
Model: 225 and 235 Excavators

- Used with 8S-2328 Dial Test Indicator Group to set pump drive bearing clearance to an accuracy of ±0.03 mm (±0.0001 in)
- Fits directly into all 3 gears of 225 Excavator pump drive and center gear of 235 Excavator pump drive
- Can also be adapted to outer two gears of 235 Excavator pump drive, which have larger splines, by using 38 mm (1.5 in) length piece of 25 mm (1.0 in) internal diameter XT-3 Hose which has been cut through on one side
- When used in outer gears of 235 Excavator pump drive, dial indicator stylus must be placed directly on gear hub, rather than the end of tool group, to achieve desired accuracy

Item	Part No.	Description
1	1K-6872	Locknut
	5H-6554	Setscrew
	1B-4330	Nut

Timing Tools for Scrap Shear Rotators

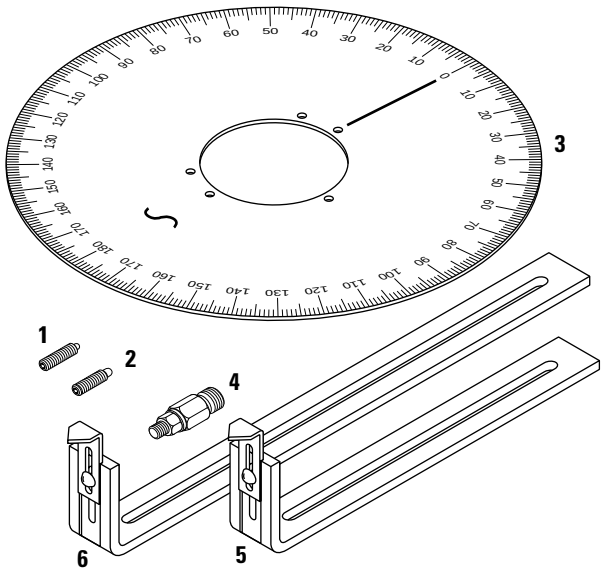
SMCS Code: 6700-531
Model: All Scrap Shears
Essential Tool

- Used to provide accurate timing of 190 degree rotating scrap shears after repair
- Two spiral gears are timed to obtain 95 degree rotation from zero in each direction
- Makes installation and timing process quicker and easier
- Use 170-0545 Degree Wheel and 170-0552 Alignment Stud Group on all models
- Use locator screws, timing ring assemblies, and pointer groups on specific models only
- Tools serviced separately to help lower dealer cost

Reference

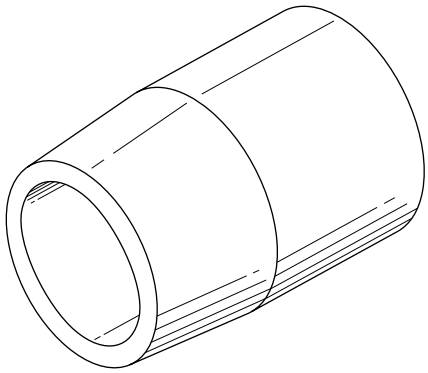
RENR4423 Service Manual, Scrap Shear Rotators

Item	Part No.	Description	Models
1	170-0542	Locator Screw	S25, S30, S40, S50, S130, S225, S230, S240, S250, S2130
2	170-0544	Locator Screw	S80, S90, S280, S290
3	170-0545	Degree Wheel	All Models
4	170-0552	Alignment Stud Group (2 required)	All Models
5	170-0553	Pointer Group	S25, S50, S130, S225, S250, S2130
6	170-0554	Pointer Group	S40, S80, S90, S240,S280, S290



226-5756 Seal Guide

SMCS Code: 5107-017
Model: 740 Ejector Articulated Truck and D400E Articulated Truck



- Used to cover threads on end of rod assembly during assembly process
- Protect seals from damage as rod assembly is pushed through gland (improves quality of service repair)
- Made of light-weight nylon for faster, easier assembly
- Resists nicks and scratches better than steel guides, providing extended tool life

Reference

RENR5176, 740 Load Ejector Machine System (Supplement)

Cylinder Spanner Wrenches

SMCS Code: 5102-017
Model: 769C, 771C, 773B, 775B, 776B, 777C, 777B, 785, 785B, 789, 789B, 793, 793B Off-Highway Trucks

- Used to remove and install intermediate cylinder heads in off-highway truck lift cylinders
- Used with 1 1/2 inch socket and ratchet, breaker bar, or torque wrench
- Each wrench fits a specific cylinder head
- Piloting tube provides positive, non-slip, spanner pin engagement
- Designed with replaceable spanner pins — light press fit enables replacement if required

Item	Part No.	Description	Number of Pins	Pin Diameter	Pin Spacing	Pilot Tube Outside Diameter	Head Part Number	Model
1	9U-7431	Cylinder Spanner Wrench	2	6.19 mm (.250 in)	140.0 mm (5.51 in)	101.06 mm (3.979 in)	9T-6879	769C and 771C
2	9U-7432	Cylinder Spanner Wrench	2	6.19 mm (.250 in)	162.0 mm (6.38 in)	126.43 mm (4.978 in)	9T-6882	773B and 775B
3	9U-7433	Cylinder Spanner Wrench	4	9.37 mm (.375 in)	176.0 mm (6.93 in)	139.13 mm (5.478 in)	9T-6885	776B, 777B, and 777C
4	9U-7434	Cylinder Spanner Wrench	4	9.37 mm (.375 in)	222.25 mm (8.750 in)	183.58 mm (7.228 in)	6E-6444 and 6E-6485	785, 785B, 789, and 789B
	9U-7435	Cylinder Spanner Wrench	4	6.19 mm (.250 in)	222.25 mm (8.750 in)	183.58 mm (7.228 in)	9T-6351	785 and 789
5	9U-7436	Cylinder Spanner Wrench	4	9.37 mm (.375 in)	262.0 mm (10.31 in)	221.68 mm (8.728 in)	6E-6609	793 and 793B
	9U-7437	Cylinder Spanner Wrench	4	6.19 mm (.250 in)	262.0 mm (10.31 in)	221.68 mm (8.728 in)	6E-0054	793
Service Parts								
	3H-0703	Dowel, 6.19 mm diameter (1/4 in)						
	5B-5821	Pin, 9.37 mm diameter (3/8 in)						

1U-7042 Locknut Spanner Wrench

SMCS Code: 5050-010
Model: 140G Motor Grader

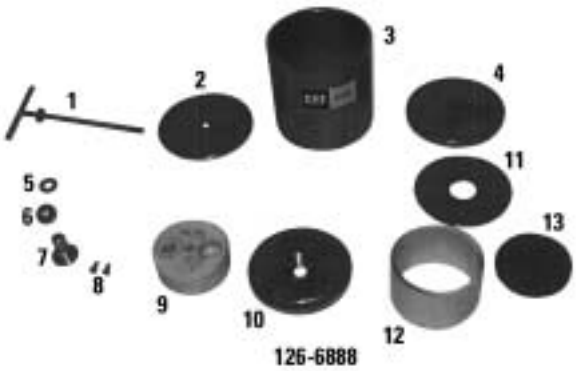
- Required to adjust 5T-1428 Bearing Locknut [136.5 mm (5 3/8 inch) outside diameter] during assembly of optional front wheel drive hydraulic motors
- Has 12.7 mm (1/2 inch) square drive; can be used with 9S-7353 or 6V-7915 Torque Wrenches
- Slide rule type torque computer, SEHS7150, can be used to determine torque wrench reading for different extensions
- Service Part: 1J-2198 Pin

126-6888 Measuring Tool Group
126-6901 Bearing Nut Spanner Wrench

SMCS Code: 5070-025, 0602, 0766
Model: 330, 330B, and 330B LL Excavators

126-6888 Measuring Tool Group

- Used to determine correct spacer thickness — when servicing rotating group, lift-off separation between barrel and port plate is critical and must be limited to prevent internal leakage at high pressure
- Lift-off separation is controlled by installing a spacer (thickness is determined using this tooling) into rotating group
- A gauge ball is also included to make sure measuring accuracy of tooling is maintained



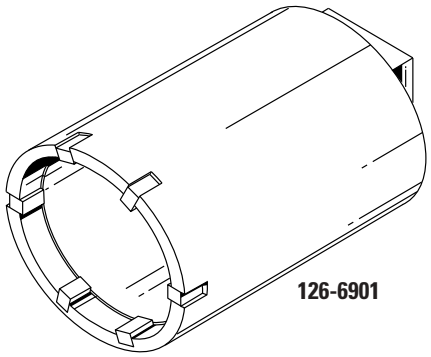
126-6888

Item	Part No.	Description
1	126-6898	Handle Assembly
2	126-6889	Cover Plate (top)
3	126-6896	Cylinder
4	126-6897	Cover Plate (bottom)
5	126-6900	Spacer
6	126-6899	Gauge Ball
7	126-6894	Gauge Pin
8	8T-9003	Socket Head Bolt
9	126-6891	Insert, Lower
10	126-6890	Support
11	126-6893	Centering Disc
12	126-6895	Spacer Tube
13	126-6892	Insert, Upper

126-6901 Bearing Nut Spanner Wrench

- Used to remove and install 5I-4479 Nut used to preload bearings in rotating group
- Used with torque wrench to obtain specified torque
- Provides best method of tightening nut
- Greatly decreases chance of wrench slipping off of nut and damaging nut and/or other pump components

126-6888 Measuring Tool Group	
Overall height	226 mm (8.9 in)
Overall diameter	152 mm (6.0 in)
126-6901 Bearing Nut Spanner Wrench	
Outside diameter	95.3 mm (3.75 in)
Overall length	219 mm (8.6 in)
Socket depth	200 mm (7.9 in)
Square drive	3/4 inch
Number of teeth	6
Tooth width	6.4 mm (.25 in)
Width between teeth	73.3 mm (2.89 in


126-6901

Reference

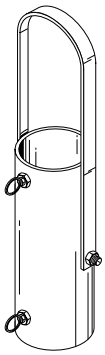
SEPD0269 Service Magazine Article, August 28, 1995

131-5121 Lifting Tool

SMCS Code: 5070-017
Model: 375, 990, 5080, 5110, 5130, 5230 Excavators

- Used to remove rotating group of Rexroth pump from pump housing
- Used with suitable hoist-type lifting device
- Tool easily attaches to pump shaft with spring-loaded plungers (plungers provide visual indication of whether tool is properly installed, and seated before lifting)
- One tool handles two sizes of pump shafts (swivel bail allows tool to be quickly changed to accept both pump shaft sizes)

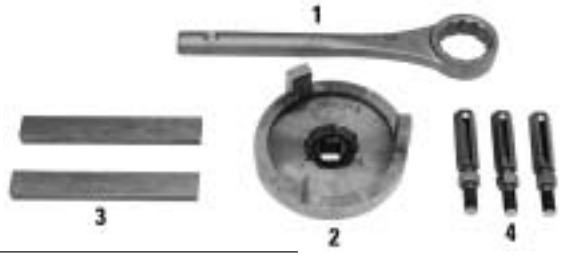
Pump shaft size (40 mm)	375, 890, and 5080
Pump shaft pump size (42 mm)	5080, 5110, 5130, 5230, and some 375
Working load limit	57 kg (125 lbs)
Bore size	40 mm (1.6 in) and 42 mm (1.7 in)
Overall length	165 mm (6.5 in)



Tools for 55, 56, 57, 58 and 59 Towing Winches

SMCS Code: 5163-016
Model: 55, 56, 57, 58 and 59 Towing Winches

- Four special tools for assembly operations on Caterpillar towing winches — 2 available from Parts Department, 2 fabricated



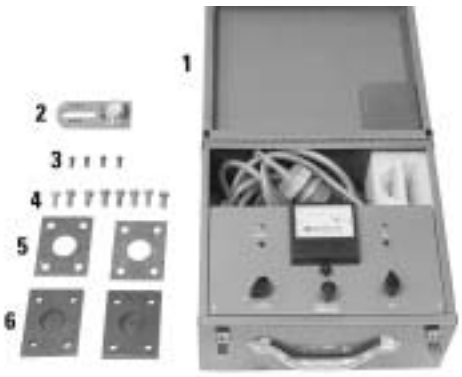
Item	Part No.	Description	No. Req'd	Winch Models	Use
1	6V-9454	Wrench	1	All	Tighten Winch mounting stud nuts
2	2P-2345	Spanner Wrench	1	57, 58, 59	Tighten Drum Shaft Nuts
3	FT1037	Gauging Bar	2	57, 58, 59	Sets and measures distance between bevel gears on directional clutch shaft
4	FT1068	Jack Assemblies	3	55, 56	Sets distance between bevel gears on directional clutch shaft

2P-8330 Blade Control Test Group

Discontinued — Service Parts Available

6D-6680 Tool Group

Discontinued — Service Parts Available



Item	Part No.	Description	Quantity
1	2P-8330	Test Group	
2	5P-4147 3P-1529 6D-3032 7D-7451	Level Assembly[1] Level[2] Screw[2] Screw[2]	
3	5S-2671	Screw[1]	4
4	4M-0061	Bolt[1]	8
5	8D-4002	Cover[1]	2
6	8D-4178	Gasket[1]	2

[1] Part of 6D-6680 Tool Group

[2] Part of 5P-4147

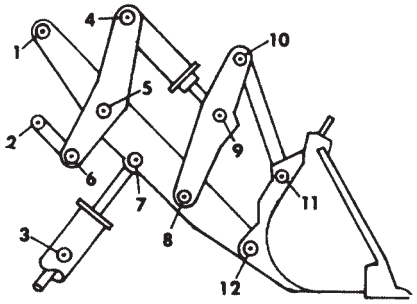
Reference

GEG02370 Special Instruction (testing and calibrating 2P-8330 Group)
FEG00020-30 Methods and Equipment bulletin, dated 2-75

Tools for Cable Controls

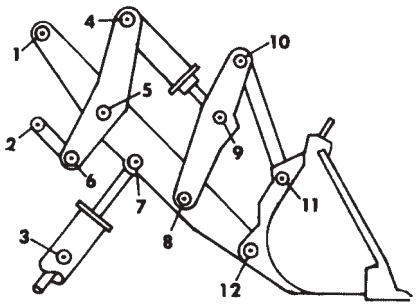
SMCS Code: 5150-011
Model: No. 21, 23, 25 and 27 Cable Controls

Item	Part No.	Description	Use
1	2H-6026	Puller Ring	Used with 2H-6021 Puller Adapter and 2H-6024 Spacer to remove drum on No. 25 and No. 27 Cable Controls
2	2H-6025	Puller Ring	Used with 2H-6024 Spacer to remove drum on No. 21 and No. 23 Cable Controls
3	2H-6024	Puller Spacer	Used with other tools to remove drum on No. 21, No. 23, No. 25, and No. 27 Cable Controls



977 Pin Removal (Pin Location)													
Part No.	**Tools Required**	**1L**	**1R**	**2**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
6V-3160	Puller (30 Ton)[1]								1		1	1	1
5H-6167	Pin	1				1							
6V-3170	Puller (50 Ton)[1]		1	1	1		1	1		1			
9S-8901	Cylinder (90 Ton In)[1]	1				1							
6H-4158	Pin	2				2							
7M-9772	Pin	1				1							
7M-9774	Adapter	1				1							
8S-6377	Lock	1				1							
9S-5431	Sleeve Assembly	1				1							
9S-5433	Adapter	1				1							
9S-5556	Adapter (1 1/2 in-12)	1											
1P-3044	Tap (1 1/2 in-12)	1											
9S-5557	Adapter (2 in-12)					1							
1P-7422	Tap (2 in-12)					1							
4C-9634	Stud (1 1/4 in-12)		1	1	1		1	1		1			
1P-3042	Tap (1 1/4 in-12)		1	1	1		1	1		1			
—	Stud (1 in-14)								1		1	1	1
1P-7421	Tap (1 in-14)								1		1	1	1
9S-5564	Sleeve Assembly		1	1	1		1	1		1			
9S-5565	Sleeve Assembly								1		1	1	1
1P-0543	Nut-Fast Runner								1		1	1	1
9U-6832	Nut-Fast Runner		1	1	1		1	1		1			

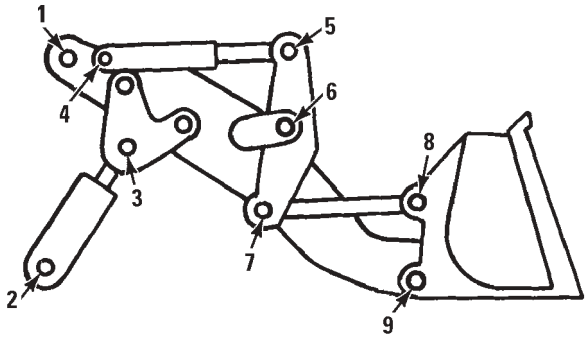
[1] Also requires one of the following pumps: 3S-6224 (115V), 8S-8033 (230V), 4C-4865



950 Pin Removal (Pin Location)													
Part No.	**Tools Required**	**1**	**2**	**4**	**5**	**6L**	**6R**	**7**	**8**	**9**	**10**	**11**	**12**
8B-7548	Push-Puller						1						
8B-7563	Handle						1						
6V-3160	Puller (30 Ton)[1]		1	1		1		1	1	1	1	1	1
6V-3170	Puller (50 Ton)[1]	1			1								
8H-0684	Wrench-Ratchet						1						
8S-6586	Screw, Forcing (1 in-14)						1						
5P-6581	Adapter (7/8 in-14)						1						
4C-9634	Stud (1 1/4 in-12)	1			1								
1P-3042	Tap (1 1/4 in-12)	1			1								
—	Stud (1 in-14)		1	1		1		1	1	1	1	1	1
1P-7421	Tap (1 in-14)		1	1		1		1	1	1	1	1	1
9S-5564	Sleeve Assembly	1		1									
9S-5565	Sleeve Assembly	1		1		1		1	1	1	1	1	1
1P-0543	Nut-Fast Runner		1	1		1		1	1	1	1	1	1
9U-6832	Nut-Fast Runner	1			1								

[1] Also requires one of the following pumps: 3S-6224 (115V), 8S-8033 (230V), 4C-4865

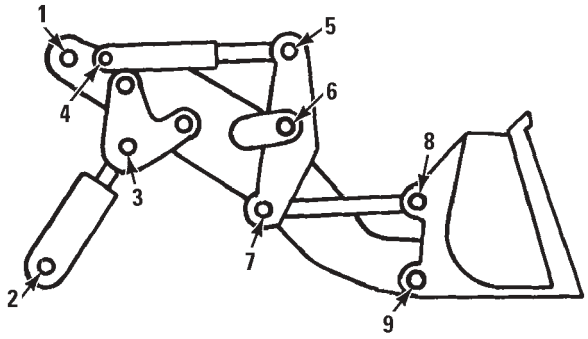
Servicing 992C Loader Linkage Pins and Collets



Collet Removal[1] (Pin Location)					
Part No.	**Tools Required**	**1**	**7**	**8**	**9**
5P-8715	Forcing Bolt	3	3	4	4
6V-0014	Cylinder[2]	1	1	1	1
6V-2072	Sleeve Assembly	1	1	1	1
6V-2073	Bushing	1	1	1	1
6V-2074	Stud	1	1	1	1
8H-3390	Nut	1	1	1	1

[1] Collets normally can be removed with forcing bolts. If, for some reason, the collets at locations 3, 8 and 9 cannot be removed with forcing bolts, use the other tools with hydraulic force.

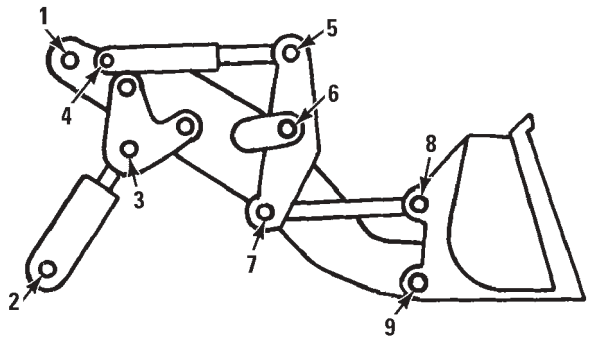
[2] One of the hydraulic pumps which follow is necessary: 5P-3100, 3S-6224 (115V) or 8S-8033 (230V).



Pin Removal[1] (Pin Location)				
Part No.	**Tools Required**	**3**	**8**	**9**
6V-0014	Cylinder[2]	1	1	1
8T-5270	Adapter	1	1	1
6V-2072	Sleeve Assembly	1	1	1
6V-2073	Bushing	1	1	1
6V-2074	Stud	1	1	1
8H-3390	Nut	1	1	1

[1] The pin at location 9 can be manually removed if the collets at both ends are first removed.

[2] One of the hydraulic pumps which follow is necessary: 5P-3100, 3S-6224 (115V) or 8S-8033 (230V).



Pin and Collet Installation (Pin Location)										
Part No.	**Tools Required**	**1**	**2**	**3**	**4**	**5**	**5[1]**	**6**	**7**	**9**
4K-0684	Flat Washer	1	1			1		1	1	1
7H-7539	Nut				1[2]				1	
4K-0684	Washer				1[2]					
9U-6832	Nut Assembly	1	1	1	1	1	1	1	1	1
6V-0113	Cylinder[3]	1	1	1	1	1	1	1	1	1
5P-8623	Coupler	1	1		1	1	1	1	1	1
5P-8712	Bushing	1	1	1	1	1	1	1	1	1
5P-8713	Plate			1						
5P-8714	Stud	1	1		1		1	1	1	1
5P-8716	Pin Handler	1	1	1	1	1	1	1	1	1
4C-9634	Stud	1	1	1		1		1		1
4V-3241	Rod				1[2]					
5P-4184	Stud						1		1	

[1] Serial numbers 42X804-Up, on right side

[2] Part is a component of the linkage

[3] One of the hydraulic pumps which follow is necessary: 5P-3100, 3S-6224 (115V) or 8S-8033 (230V).

5P-2963 Charging Adapter

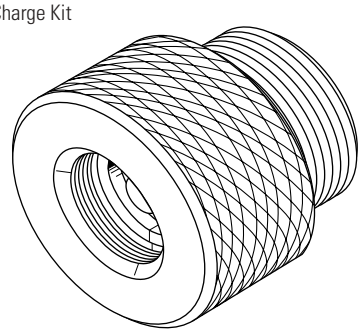
SMCS Code: 5163-081, 6305-081, 7336-045
Model: 528, 633D, 776, 777, 777B, 785
Warranty: One Year

- Used with 175-5507 Nitrogen Charging Group to pressure check and charge accumulator for 8D-8920 Bostrom-Norseman Suspension Seat Group used on Caterpillar Wheel Tractor-Scrapers
- .311 in-32 Thd x .500 in-20 Thd
- Service part: 4J-7533 Seal

209-2112 Nitrogen Adapter

Model: MT735, MT745, MT765, MT835, MT855, and MT865 GEN 111 Challenger Tractor

- Used to provide required connection between charging kit and accumulator
- Used with 152-2023 Nitrogen Charge Kit

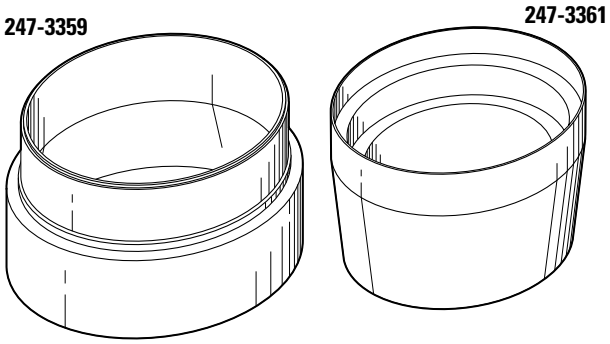


247-3359 Accumulator Piston Installer
247-3361 Accumulator Seal Installer

SMCS Code: 7201-010
Model: 797B Off Highway Truck
Essential Tool
Warranty: None

- Used to assemble piston into steering accumulator without damaging new seals
- Seal installer makes seal installation onto piston much easier and prevents damage
- Piston installer is placed into accumulator and piston is pressed through installer—prevents seal damage by accumulator threads

Reference
797B Service Manual

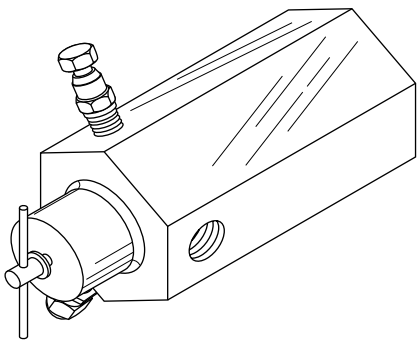


150-2332 Charging Adapter

SMCS Code: 5077
Model: 785, 789, and 793 Off-Highway Trucks
Essential Tool

- Used to charge or check charge pressure on Greer accumulators with Schrader valve
- Used with 8T-0859 Pressure Gauge with 0 to 3600 PSI range and 175-5507 Nitrogen Charging Group
- Thread engages accumulator body instead of Schrader valve
- T-handle depresses Schrader valve on accumulator
- Adapter has bleed valve and Schrader valve connection for charging group

Body size	38.1 mm (1.50 in) hex
Overall length (without handle)	92.0 mm (3.6 in)
Body thread size	7/8-14
Pressure gauge thread size	1/4-18 NPTF



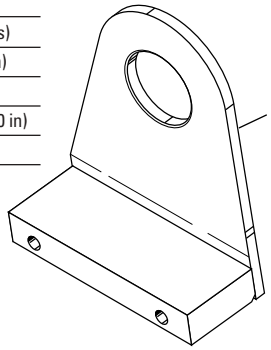
Cab Removal and Installation Tools

SMCS Code: 7301-010
Model: 416C, 426C, 428C, 436C, and 438C Backhoe Loaders

133-9873 Bracket Assembly

- Used to remove and install cab on all C-Series backhoe loaders (two required)
- Used with 133-9874 Spreader Bar Assembly
- Attaches to existing holes in top frame rail of cab, using M10 x 1.5 bolt
- Provides lift point at each rear corner of cab
- Large hole in bracket allows use of nylon sling or chain hook
- Prevents damage to cab roof panel

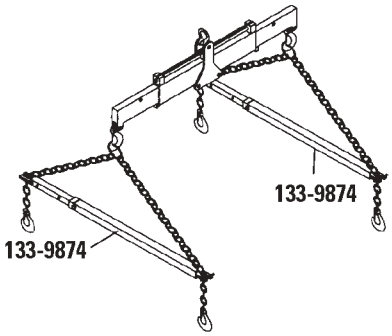
Lifting capacity (WLL)	227 kg (500 lbs)
Length	140 mm (5.5 in)
Width	57 mm (2.2 in)
Height	178.0 mm (7.00 in)
Hole diameter	50 mm (1.9 in)



133-9874 Spreader Bar Assembly

- Used with 133-9873 Bracket Assembly to prevent damage to cab roof panel during removal/installation (two required)
- Requires double chain sling with 1/2 inch chain and 6V-3145 Load Leveler (not supplied with tool)
- Adjustable length from 1067 mm (42.0 in) to 1677 mm (66.0 in) in increments of 76 mm (3.0 in)
- Used with a double sling chain to lift cab vertically at attach points eliminates side loading
- End pin keeps chain from becoming disengaged when device is being used

Lifting capacity (WLL)	454 kg (1000 lbs)
Adjustable length	1067 mm (42.0 in) to 1677 mm (66.0 in)
Incremental adjustment	76 mm (3.0 in)
Tube size (external)	44.5 mm (1.75 in)
Tube size (internal)	38.1 mm (1.50 in)



Reference

SENR1206 Service Manual, Disassembly and Assembly - 416C, 426C, 428C, 436C, and 438C Backhoe Loaders Power Train

5P-7323 Bearing Nut Spanner Wrench

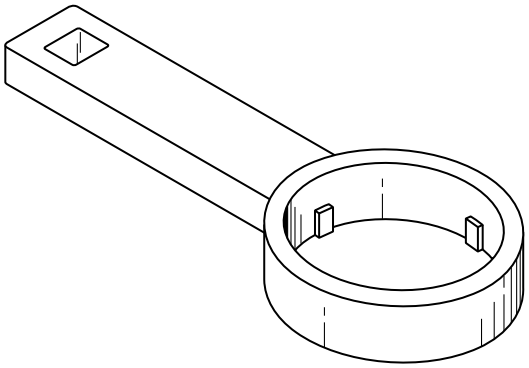
SMCS Code: 3108-010
Model: 988B

- Used to remove and install spanner nut which retains bearing in implement pump drive on 988B Wheel Loaders

219-0476 Spanner Wrench

SMCS Code: 7057-029, 7116-010
Model: 570B and 580B Harvesters

- Used to remove and install 161-5560 Spanner Nut (articulation hitch)
- Used with 3/4 inch drive torque wrench
- Effective torque wrench adapter length is 200 mm (7.87 in.)
  [Example: If required torque is 500 N·m (369 ft-lb) and if 9U-5007 Torque Wrench is used, dial reading should be 420 N·m (310 ft-lb).]



References

RENR6145 Service Manual, Machine Systems Disassembly and Assembly

SENR8203 Service Manual, Vehicle Systems Disassembly and Assembly, D400D

990 Articulation Hitch Pin Pulling Tools

SMCS Code: 7051-776, 7051-777
Model: 990 Wheel Loader

- Used to pull articulation hitch pins and bearings — saves time and eliminates damage to pin
- Used with 6V-0014 Cylinder and 9U-6810 Speed Nut
- Hydraulic removal of pin is preferred over other methods, such as burning, cutting, or drilling
- M48 threads provide a maximum of 890 kN (100 tons) of hydraulic pulling force
- All plates and sleeves serviced separately

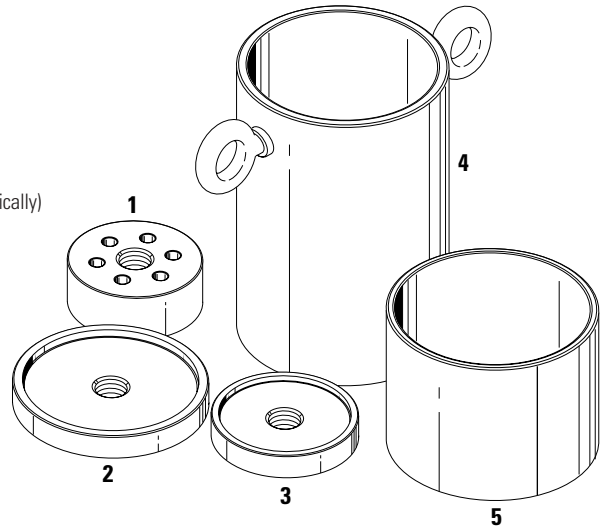
124-4637 Adapter Plate
- Used to remove 4E-8152 Top Hitch Pin on early 990's (no puller hole for removing the pin hydraulically)
- Later models, with pin puller hole, do not require this adapter plate

124-4638 Bearing Puller Plate
- Used to remove the top articulation hitch pin bearing

124-4639 Bearing Puller Plate
- Used to remove the bottom articulation hitch pin bearing

124-4640 Receiving Sleeve Assembly
- Used to remove the top and bottom articulation hitch pins

124-4641 Receiving Sleeve
- Used to remove the top and bottom articulation hitch pin bearings



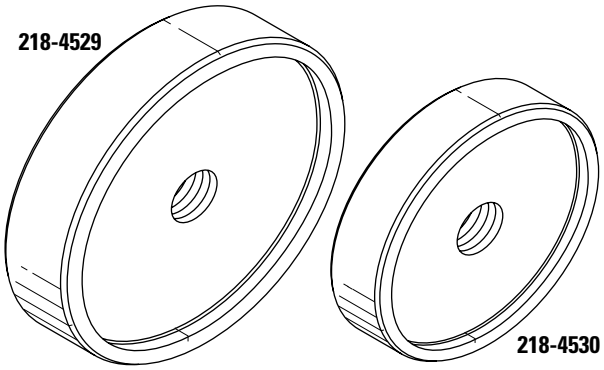
Item	Part No.	Description	Recess Diameter	Inside Diameter	Overall Diameter	Outside Diameter	Thickness	Puller Hole Thread	Rated Capacity	Lifting Eyes	Overall Length
1	124-4637	Adapter Plate	—	—	177.8 mm (7.00 in)	—	76.2 mm (3.00 in)	M48 X 5	890 kN (100 tons)	—	—
2	124-4638	Bearing Puller Plate (upper bearing)	214 mm (8.43 in)	—	251 mm (9.88 in)	—	38 mm (1.5 in)	M48 X 5	—	—	—
3	124-4639	Bearing Puller Plate (lower bearing)	174.0 mm (6.85 in)	—	193.5 mm (7.62 in)	—	38 mm (1.5 in)	M48 X 5	—	—	—
4	124-4640	Receiving Sleeve Assembly (pin removal)	—	254 mm (10.0 in)		279.4 mm (11.00 in)	—	—	890 kN (100 tons)	2	450 mm (17.7 in)
5	124-4641	Receiving Sleeve (bearing removal)	—	265.0 mm (10.43 in)		279.4 mm (11.00 in)	—	—	890 kN (100 tons)	—	216 mm (8.5 in)

218-4529 Bearing Puller Plate
218-4530 Bearing Puller Plate

SMCS Code: 7054, 7117, 7551-011
Model: 950G and 962G Series I and II Wheel Loaders; IT62G Series I and II Integrated Toolcarrier

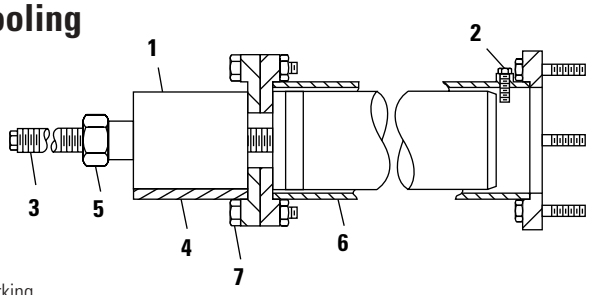
- Used to remove both bearing cups and cones from lower and upper hitch articulation joints
- Used with 6V-3160 Double Acting Hydraulic Cylinder and 9U-5345 Fast Runner Nut Assembly (M24 x 3.0)
- Use 218-4529 for lower hitch articulation joint and 218-4530 for upper joint
- Hydraulic removal of bearings is preferred over other methods, such as burning, cutting, or drilling

Threaded hole	M24 x 3.0
Maximum pulling force	267 kN (30 tons)
Outside diameter (218-4529)	136.0 mm (5.35 in)
Outside diameter (218-4530)	106.0 mm (4.17 in)



5130 Mining Excavator Pin Removal/Installation Tooling

SMCS Code: 5456, 5457, 5458, 6108, 6500, 6502, 6503, 6512-010
Model: 5130 Mining Excavators (Front Shovel and Backhoe Styles)



Typical pin installer and cradle assembly

Item	Description
1	Hydraulic Cylinder
2	Square Head Setscrew (locking stud)
3	Threaded puller rod
4	Cradle assembly
5	Fast runner nut
6	Pin installer
7	Bolt Washer Nut

Pin Pullers

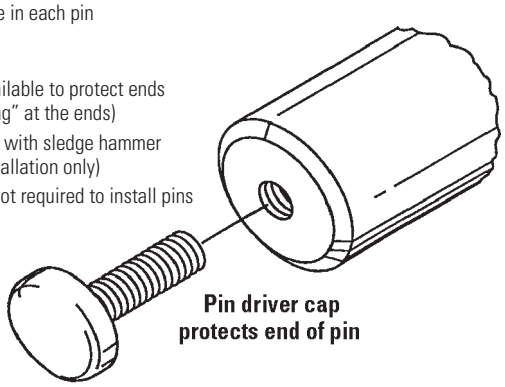
- Used to remove and install boom to frame pin, stick to boom pin, bucket to stick pin, and all related cylinder pins — tooling is essential to properly handle large pins without damage
- Used with general tooling listed below in "General Tooling Used for All Pins"
- A locking stud is designed into each pin installer to lock pin inside installer (essential when working overhead)
- Each pin installer should be fitted with the correct cradle assembly to hold hydraulic cylinder in place

Threaded Puller Rods and Fast Runner Nuts

- Threaded rods, in various lengths, used to pull pins into or out of pin bore
- Fast runner nuts are used with threaded rod to make removal of pins faster and easier
- Puller rods screw into threaded hole in each pin

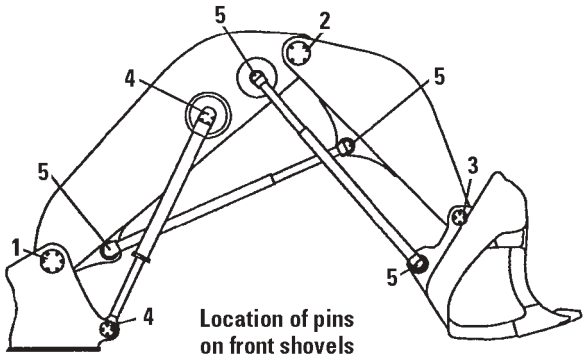
Pin Driver Caps

- Two sizes of pin driver caps are available to protect ends of pin (keeps pin from "mushrooming" at the ends)
- When installed, the caps can be hit with sledge hammer to drive pins into bore (used for installation only)
- Used only when hydraulic force is not required to install pins



Pin driver cap protects end of pin

5130 Front Shovel Tooling Usage



Location of pins on front shovels

Item	Description
1	Boom to swing frame pin
2	Stick to boom pin
3	Bucket pin
4	Cylinder pins
5	Cylinder pins

General Tooling Used for All Pins	
Part No.	**Description**
9U-6702	Threaded Puller Rod, 2.6 m (8.5 ft) long with M64 thread (1)
9U-6800	Fast Runner Nut with M64 thread (1)
5P-5201	Hydraulic Cylinder with 150 ton capacity (1)
3S-6224 8S-8033	Hydraulic Pump — 115 VAC (1) Hydraulic Pump — 230 VAC (1)
6D-7726	Hydraulic Hose (2)

Part No.	Description
Pin No. 1 (boom to swing frame)	
Removal	
1U-6213	Boom Pin Tube Assembly[1]
9U-6798	Hydraulic Cylinder Plate Assembly[1]
Installation	
4C-9544	Pin Driver Cap
Pin No. 2 (stick to boom)	
Removal	
161-1783	Receiver Sleeve
9U-6798	Hydraulic Cylinder Plate Assembly[1]
Installation	
9U-6798	Hydraulic Cylinder Plate Assembly[1]
Pin No. 3 (bucket pin)	
Removal	
9U-6792	Pin Puller Assembly
Installation	
1U-6211	Bucket Pin Installer Assembly

Part No.	Description
Pin No. 4 (cylinder pin)	
Removal/Installation	
9U-6706	Cylinder Pin Puller Assembly
4C-6504	Threaded Puller Rod, M64 thread x 1.2 m (4.0 ft) long[2]
4C-9544	Pin Driver Cap (installation only)
Pin No. 5 (cylinder pin)	
Removal/Installation	
9U-6706	Cylinder Pin Puller Assembly
9U-6814	Threaded Puller Rod, M48 thread x 1.2 m (4.0 ft) long[2]
9U-6903	Fast Runner Nut, M48[2]
9U-6758	Pin Driver Cap (installation only)

[1] Part of 9U-6791 Pin Installer Group; 9U-6791 contains the basic group of tools for removing pins (Group includes: 1U-6213, 9U-6798, 2H-3889, 6V-8237, 8T-0363, and 8T-4001).

[2] DO NOT USE similar tool from general tooling list.

PTO Component Tools

SMCS Code: 3107-010, 012, 015
Model: Challenger 35, 45 and 55

- Used to remove, install, assemble, and disassemble components of PTO

1U-9059 Bracket

- Used to lift PTO during removal and installation (holds PTO assembly in a horizontal position)
- Used with overhead lifting device
- Attaches to PTO housing cylinder bracket for three point hitch

1U-9066 PTO Hub Puller

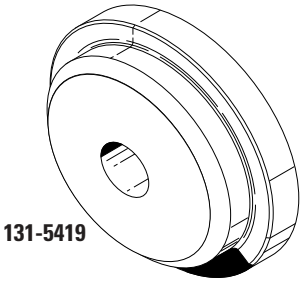
- Used to remove PTO clutch housing assembly (hub)
- Used with 8B-7548 Push/Puller Group

131-5419 PTO Installer

- Used to install 112-8695 Seal for PTO output shaft and 112-8436 Seal for rock shaft
- Handle can be attached to installer and seals are then driven into place
- Installer provides additional protection to seal during installation

Reference

SENR8300 Service Manual



131-5419 PTO Installer	
Outside diameter	92.0 mm (3.62 in)
Pilot diameter	74.3 mm (2.93 in)
Diameter of center hole	6.63 mm (.26 in)

Front and Rear Stand Group

SMCS Code: 7051-010
Model: Challenger 35, 45 and 55

- Used to support engine and front frame when splitting t~ractor to remove transmission or other driveline components
- Bolts directly to frame using counterweight bolt holes
- Both supports can be adjusted for height (adjustments should not be made when supports are holding full load of tractor)
- Front support bolts into front counterweight bolt holes — two rear supports bolt into counterweight bolt holes in side of frame
- Rear supports bolt on with 0S-1626 Bolts and 2J-3506 Nuts — front support uses counterweight mounting bolts

Reference

SENR8300 Service Manual

1U-9074 Front Stand Group		
Item	Part No.	Description
1	1U-9076	Front Stand Assembly
2	1U-9077	Leg Assembly
3	5F-7366	Screw
4	1A-1935	Nut (two required)
Not shown	5F-7353	Thrust Washer

Front and Rear Stand Groups Installed

1U-9073 Rear Stand Group		
Item	Part No.	Description
1	1U-9077	Leg Assembly
2	1A-1935	Nut (two required)
3	5F-7366	Screw
4	1U-9075	Rear Stand Assembly
5	5F-7353	Thrust Washer

1U-9832 Drive Shaft

SMCS Code: 0784
Model: Most Caterpillar models

- Universal Drive Shaft Size 27 (Aidco, Wolff, Schroder Standard Shaft)
- Also allows Caterpillar 1U-9400 Test Bench owners to run smaller components with small drive shaft (requires 4C-4336 Adapter)

Reference

NEHT5000 Bench Testing Hydraulic Components—complete listing of general test bench tooling

Motor Stall Adapters

SMCS Code: 0784
Model: Most Caterpillar Models

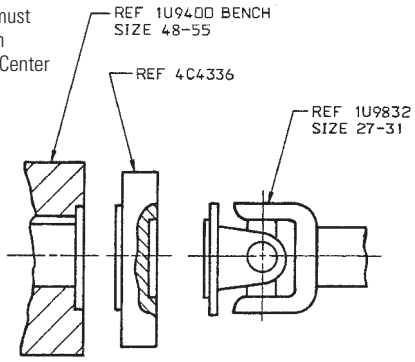
- Used to stall test hydraulic fluid motors

Part No.	Spline
4C-4679	32T-16/32 External
4C-4680	19T-16/32 Internal
4C-4681	13T-8/16 Internal

4C-4336 Drive Shaft Adapter

SMCS Code: 0784
Model: Most Caterpillar Models

- Allows 1U-9400 Hydraulic Test Center owners to install optional 1U-9832 Drive Shaft to drive hub on test center
- When bench testing small pumps and motors on 1U-9400, a smaller drive shaft is required due to the mass of standard drive shaft; if any misalignment occurs during pump installation, large shaft could overwhelm small component splined shaft causing vibration and severely loading component shaft bearing; smaller, optional 1U-9832 Drive Shaft corrects this situation but 4C-4336 Adapter plate must be used to couple it with 1U-9400 Hydraulic Test Center
- Plate adapts from SAE size 55 drive shaft configuration to SAE size 27 pattern



Bench Testing Hydraulic Components Fittings and Drive Connections

SMCS Code: 0784
Model: Most Caterpillar Models

- General oil connection fittings used while testing hydraulic pumps, motors, and transmissions
- Used when testing variety of Caterpillar and competitive hydraulic components
- Good low to medium pressure base to support test bench needs

Item	Part No.	Description
1		2-Bolt Flanges (BHC = Bolt Hole Center)
	1U-9849	Flange 1/2 in Pipe X 1-7/8 in BHC
	1U-9850	Flange 1 in Pipe X 2-1/2 in BHC
	1U-9851	Flange 1 in Pipe X 1 in BHC
	1U-9852	Flange 1 in Pipe X 2-1/2 in BHC
	1U-9853	Flange 1 in Pipe X 2-5/8 in BHC
	1U-9854	Flange 1 in Pipe X 2-3/4 in BHC
	1U-9855	Flange 1 in Pipe X 2-7/8 in BHC
	1U-9856	Flange 1 in Pipe X 3 in BHC
	1U-9858	Flange 1 in Pipe X 3-1/4 in BHC
	1U-9859	Flange 1 in Pipe X 3-3/7 in BHC
	1U-9860	Flange 1 in Pipe X 3-5/8 in BHC
	1U-9862	Flange 1 in Pipe X 3-3/4 in BHC
	1U-9864	Flange 1 in Pipe X 4-1/2 in BHC
	1U-9857	Flange 1 in 1/2 Pipe X 3 in BHC
	1U-9861	Flange 2 in Pipe X 3-5/8 in BHC
	1U-9863	Flange 2 in Pipe X 4 in BHC
	1U-9865	Flange 2-1/2 in Pipe X 4-1/2 in BHC

Item	Part No.	Description
2		4-Bolt Flanges
	1U-9871	Flange 3/4 in Pipe
	1U-9872	Flange 1 in Pipe
	1U-9869	Flange 1-1/4 in Pipe
	1U-9870	Flange 1-1/2 in Pipe
	1U-9873	Flange 2 in Pipe
	1U-9874	Flange 2-1/2 in Pipe
	1U-9866	Flange 3 in Pipe
	1U-9867	Flange 3-1/2 in Pipe
	1U-9868	Flange 4 in Pipe
3		Camlock Fittings
	1U-9879	Adapter 3 in X 3 in FPT Adapter
	1U-9880	Adapter 4 in X 4 in FPT Adapter
4		Suction Hose and Fittings
	1U-9875	Coupler 3 in X 3 in Hose Barb
	1U-9876	Coupler 4 in X 4 in Hose Barb
	1U-9881	Hose 3 in ID. X 12 ft (not shown)
	1U-9882	Hose 4 in ID. X 12 ft (not shown)
5		Camlock Fittings
	1U-9877	Adapter 3 inch Coup. X 4 inch NIP
	1U-9878	Adapter 3 inch NIP. X 4 inch Coup. (not shown)

MIG/TIG Flowmeter Regulators

- Construction incorporates regulator and flowmeter into one compact unit.
- Flow to 70 S.C.F.H.
- Strong easy-to-read Lexan flow tube and cover
- Flow tube is easily changed for different gases.
- Dual calibration on argon/carbon dioxide flow tube
- Regulator is pre-set at 50 P.S.I.G.
- Flowmeter is not affected by downstream pressure variations.
- Sensitive needle valve for fingertip control
- U.L. listed

Gas	Part No.	Flow Capacity (SCFH)	Cylinder Connection	Delivery Rate (SCFH)
Argon	4C-4125	0-70	580	70
Carbon Dioxide	4C-4126	0-70	320	70

MIG/TIG Flowgauge Regulators

- For accurate measurement of gas flow to 40 S.C.F.H.
- Sensitive brass adjusting key provides smooth action, and fingertip control.
- Lightweight, rugged design
- Easy-to-read gauges
- U.L. listed

Gas	Part No.	Flow Capacity (SCFH)	Cylinder Connection	Delivery Rate (SCFH)
Argon	4C-4123	0-40	580	40
Carbon dioxide	4C-4124	0-40	320	40

Welding Hose

Part No.	Description	Dimensions
1U-8215	Twin Welding Hose	4.76 mm x 3.66 m (3/16 in x 12 ft)
1U-8217	Twin Welding Hose	6.35 mm x 6.1 m (1/4 in x 20 ft)
1U-8218	Twin Welding Hose	6.35 mm x 15.25 m (1/4 in x 50 ft)

Check Valves

- External type for easy inspection
- For use on any torch with "B" hose connections (9/16 inch-18 threads)
- Stops reverse flow of gas

Oxygen or Fuel Gas Inlet	
Part No.	Description
1U-6465	Fuel Gas
1U-6466	Oxygen

1U-6573 Circle Cutting Attachment

- For cutting circles up to 762 mm (30 in) in diameter as well as straight line burning
- A swivel nut permits circle cutting without tangling hoses.
- Wheels are adjustable for individual torch height.
- Makes better quality cuts possible with hand torches

Industrial Duty, Cold Water, Electric-Powered Pressure Washers (Portable)

CE Compliant (237-9168, 237-9169)

- Rugged roll cage and chassis made of 31.75 mm (1 1/4 inch) steel powder-coated with an epoxy finish for all-weather protection
- Totally enclosed, OSHA-compliant, high-impact polyethylene belt guard and easy-to-adjust belt tension device
- Industrial-grade, tri-plunger, oil-bath Legacy high pressure pump with forged brass head and three ceramic pistons; backed by a 5-year Legacy warranty
- Safety thermal pump saver valve protects against hot water damage by venting recirculated water
- Easy-to-attach downstream detergent injector with brass soap nozzle
- Inlet strainer protects pump from debris in the water source
- Insulated trigger gun for hours of fatigue-free cleaning
- Durable wire braid hose rated for up to 345 Bar (5000 PSI) with swivel crimp fitting for tangle-free washing
- Insulated, stainless steel wand with quick-couple connectors for easy attachment of high-pressure nozzles
- Five conveniently mounted, quick-couple, high-pressure spray nozzles for varying fan spray
- 33 cm (13 inch) tubed pneumatic tires with steel wheels for easy maneuvering on all terrains and vibration absorption
- Rubber feet to absorb vibration and keep the unit from "walking"
- Notched V-belts and cast iron pulleys reduce belt slippage and provide longer pump life
- Warning and operating instructions visible on unit
- Industrial-duty Baldor motor with 3 m (10 ft) electrical cord and Ground Fault Circuit Interrupter (GFCI) for operator protection
- Heavy-duty lifting beam for ease in loading and transporting

Cat Part No.	235-3047	235-3046	237-9169	235-3049	235-3048	237-9168
Pressure	138 Bar (2000 PSI)	138 Bar (2000 PSI)	138 Bar (2000 PSI)	207 Bar (3000 PSI)	207 Bar (3000 PSI)	207 Bar (3000 PSI)
Volume	16 l/min (4.2 gpm)	16 l/min (4.2 gpm)	16 l/min (4.2 gpm)	18 l/min (4.8 gpm)	18 l/min (4.8 gpm)	18 l/min (4.8 gpm)
Pump	Belt	Belt	Belt	Belt	Belt	Belt
Horsepower	6 HP electric motor	6 HP electric motor	6 HP electric motor	10 HP electric motor	10 HP electric motor	10 HP electric motor
Volts/Hz/ph	230/50/3	230/50/3	230/50/3	230/1/60	220/1/50	230/50/3
Amps	29	30	30	29	24	24
Soap control	Low pressure	Low pressure	Low pressure	Low pressure	Low pressure	Low pressure
Hose length, diameter	15.25 m x 9.53 mm (50 ft x 0.375 in)	15.25 m x 9.53 mm (50 ft x 0.375 in)	15.25 m x 9.53 mm (50 ft x 0.375 in)	15.25 m x 9.53 mm (50 ft x 0.375 in)	15.25 m x 9.53 mm (50 ft x 0.375 in)	15.25 m x 9.53 mm (50 ft x 0.375 in)
Gun type	Trigger shutoff	Trigger shutoff	Trigger shutoff	Trigger shutoff	Trigger shutoff	Trigger shutoff
Tip type	Multi jet	Multi jet	Multi jet	Multi jet	Multi jet	Multi jet
Adjustable pressure	Standard	Standard	Standard	Standard	Standard	Standard
Shipping weight	68 kg (150 lbs)	68 kg (150 lbs)	136 kg (3000 lbs)	78 kg (170 lbs)	78 kg (170 lbs)	104 kg (230 lbs)
Replacement tip kit	235-3109	235-3110	235-3110	235-3109	235-3109	235-3109
Replacement hose	235-3120	235-3118	235-3118	235-3120	235-3120	235-3120
Replacement spray gun	235-3126	235-3126	235-3126	235-3126	235-3126	235-3126
Replacement wand group	235-3129	235-3129	235-3129	235-3129	235-3129	235-3129
Dimensions (L x W x H)	1067 x 737 x 737 mm (42 x 29 x 29 in)	1067 x 737 x 737 mm (42 x 29 x 29 in)	965.2 x 762 x 762 mm (38 x 30 x 30 in)	1067 x 737 x 737 mm (42 x 29 x 29 in)	1067 x 737 x 737 mm (42 x 29 x 29 in)	965.2 x 762 x 762 mm (38 x 30 x 30 in)

Multi-Reg Kits

Warranty: Manufacturer's

- Allows you to adjust both pressure and spray pattern
- You can select high or low pressure by pushing forward or pulling backward
- You can select spray pattern from 0 to 60 degrees by turning nozzle
- Operates up to 20670 kPa (3000 PSI)

Machine Use	
4C-6028 #4 Multi-Reg Kit	1000 PSI @ 2.0-2.2 gpm
4C-6029 #5 Multi-Reg Kit	1500 PSI @ 3.0-3.5 gpm
164-2465 #6 Multi-Reg Kit	2000 PSI @ 4.0-4.5 gpm

Field Attachable Ground Fault Circuit Interrupter

Warranty: Manufacturer's

- Ground Fault Circuit Interrupter (G.F.C.I.) plug provides protection from dangerous ground fault hazards
- Handles wire sizes from 18 AWG to 12 AWG up to 10 amps

Part No.	Voltage
164-2466	110 Volt
164-2467	220 Volt

Medium and Heavy Duty Sand Blasters

Warranty: Manufacturer's

4C-6030 Medium Duty Sand Blaster

- Combines high pressure water with sand to remove graffiti, paint, baked on grease, rust, and much more
- Constructed of a bronze body, steel orifice, and a replaceable tungsten carbide tip
- Comes with sand blast head, hose, and probe with twist fast adapter to couple to end of wand
- For use up to 3500 PSI at 4.0 gpm

4C-6031 Heavy Duty Sand Blaster

- Combines high pressure water with sand to remove graffiti, paint, baked on grease, rust, and much more
- Constructed of an aluminum body, hardened stainless steel tip, and tungsten carbide sand nozzle
- Comes with sand blast head, hose, and probe with twist fast adapter to couple to end of wand
- For use up to 4000 PSI at up to 10.0 gpm

Quick Reference Replacement Parts

Warranty: Manufacturer's

Part No.	Description
4C-6011	#30 Gun (1000 to 1500 PSI)
4C-6012	3000 lb Gun (2000 to 4000 PSI)
4C-6013	Gun Repair Kit for 4C-6011
4C-6014	Gun Repair Kit for 4C-6012
4C-6016	1/4 inch Insulated Wand
4C-6017	20 ft Pressure Hose
4C-6018	40 ft Pressure Hose
4C-6019	50 ft x 3/16 in Hydraulic Hose
4C-6038	Twist Fast Plug x 1/4 Male
4C-6039	Twist Fast Plug x 1/8 Male
4C-6040	Twist Fast Plug x 1/4 Female
4C-6041	Twist Fast Socket x 1/4 Female

Part No.	Description
4C-6042	Twist Fast Socket x 1/8 Female
4C-6050	1/4 inch Quick Coupler Plug
4C-6051	1/4 inch Quick Coupler Socket
4C-6052	3/8 inch Quick Coupler Plug
4C-6053	3/8 inch Quick Coupler Socket
4C-6066	#4 Multi-Reg Tip
4C-6067	#5 Multi-Reg Tip
4C-6068	#4 Tip, 0° (1/4 inch)
4C-6069	#4 Tip, 15° (1/4 inch)
4C-6070	#6 Tip, 0° (1/4 inch)
4C-6071	#6 Tip, 15° (1/4 inch)
4C-6072	4030 Soap Tip, 1/4 inch

Diagnostic Tool Repair Program Policies and Procedures

Repair charge for:

1. Warranty repairs — must provide Repair Center with purchase order number to pay for repair and make warranty claim with Caterpillar. Call the CSTG Hotline for authorization number if claim is over $200.
2. Normal repairs — basic repair price. Please contact Repair Center for current basic repair prices.
3. Repairable components with major damage (major damage means replacement is needed for a major component such as a transducer, power cord, or pc board) — basic repair price does not apply; the Repair Center will contact owner with a separate repair quote.
4. Additional components (something which is not included is the standard Tool Group) — advise owner if extra charges will exceed U.S. $25.
5. Non repairable tools — The Repair Center will advise owner of condition and whether owner can obtain replacement from Caterpillar.

Freight/Shipping policy:

1. Owner pays shipping to the Repair Center. The Repair Center pays return shipping. This policy applies worldwide.
2. If you send tools not listed on the "Diagnostic Tool Repair List" sheet, you will be invoiced for the costs to return or reship the tools.

Instructions:

Documentation required when sending tools to Caterpillar Service Technology.

1. Sender's name, phone number, fax number and e-mail address.
2. Part number and name of each tool.
3. Brief description of problem.
4. Return shipping address of owner.
5. Billing address of owner.
6. Purchase order number is required (required for warranty also).
7. Owner outside the U.S. must specify what wording on customs declarations is required for the Repair Center to properly return the tool.

TESTO UNITED KINGDOM
3 Oriel Court
Omega Park
Alton, Hampshire GU34 2QE

01 420-544433
FAX 01 420-544434

United Kingdom

TESTO USA
35 Ironia Road
Flanders, NJ 07836

(973) 252-1720
FAX (973) 252-1729

T.I.F. INSTRUMENTS, INC.
Attn: Repair Dept.
9101 N.W. 7th Ave.
Miami, FL 33150

(305) 757-8811
(800) 327-5060

TORNADO
See Brewer Electric Mfg. Co. or call Caterpillar Service Technology for authorized service locations.

TRANSCAT
10 Vantage Point Drive
Suite 1
Rochester, NY 14624

(800) 828-1470
FAX (800) 395-0543

TRIANGLE TOOL COMPANY
Attn: Calibration
Cameron Road
Orangeburg, SC 29115

(803) 534-7010

TUXCO
4300 Grove Ave.
Gurnee, IL 60031

(708) 244-2220

Call before shipping

U.E. SYSTEMS, INC.
12 West Main St.
Elmsford, NY 10523

(914) 592-1220

WASHINGTON SCIENTIFIC INDUSTRIES, INC.
See ANACOMP Inc.

WEBSTER INSTRUMENTS
1331 E. Waterford Ave.
Milwaukee, WI 53207

(414) 769-6400

WUJA
Inside USA: See Carrier-Oehler

Outside USA:
Contact WIKA Distributor.

XIDEX-MIDO
857 W. State Street
Hartford, WI 53027

(800) 558-0180
FAX (414)-673-3564

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