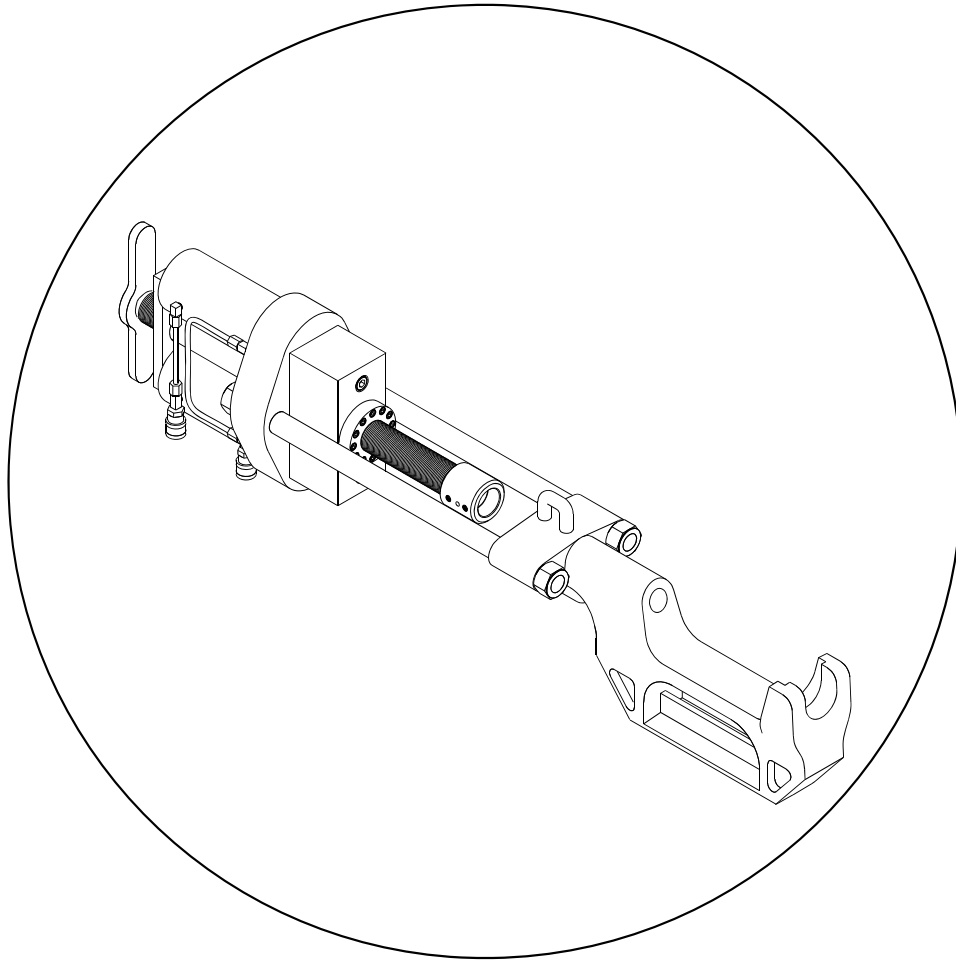


M P P 1 0 0

1 0 0 T o n P o r t a b l e P i n P r e s s



Machinery, LLC

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MANUFACTURERS/BENEFICIARY'S WARRANTY CERTIFICATE WTC MACHINERY, LLC WARRANTY

WTC MACHINERY, LLC warrants its products to be free from defects in material and workmanship under normal use and service for a period of twelve (12) months after date of shipment. WTC MACHINERY, LLC undertakes to be responsible for any defect that may arise due to faulty raw materials, design, workmanship and defective parts and to replace them without extra cost. Our warranty is not transferable.

WTC MACHINERY, LLC shall have the option of requiring the return of all parts claimed defective. Parts proved to be defective, due to defect in workmanship and/or material, shall be either repaired or replaced free of charge, F.O.B. our designated factory. All parts warranty claims are subject to inspection by WTC MACHINERY, LLC and acceptance at the factory

Our warranty does not obligate us to bear the cost of labor or transportation charges in connection with the replacement or repair of defective parts and the removal and/or remounting of the parts repaired or replaced under this warranty, unless specifically authorized in writing by WTC MACHINERY, LLC. All parts returned to the factory must be shipped freight prepaid; no collect freight will be accepted by the factory. Forms authorizing such returns for inspection must accompany all returns.

This warranty shall not apply to products not manufactured by WTC MACHINERY, LLC. Outside purchased equipment and accessories (not of WTC manufacture) are warranted only to the extent of the original equipment manufacturer's warranty and subject to their allowance to WTC MACHINERY, LLC. In this respect, our warranty obligations must conform and be limited to the warranty extended to WTC MACHINERY, LLC by its suppliers as extended to the customer.

We shall, in no event, be liable for consequential damages or contingent liability arising out of the failure of any unit or part to operate properly, or that is subject to:

- Ordinary operating wear, abuse, misuse, or overloading;
- Repairs or alterations by parties other than WTC MACHINERY, LLC;
- The use of improper fluids, contaminated fluids or improper filtering;
- The use of improper voltage hookup in the electrical connections of any equipment;
- Negligence, accident or damages due to deterioration during periods of storage by the purchaser prior to installation and operation;
- Damages occurred in shipment after leaving factory en route to customers' delivery point, as title to equipment passes to customer when loaded onboard for shipment, f.o.b. factory, and customer must place his own claim against damaged goods directly to the shipping company and not against WTC MACHINERY, LLC, its factory, or any of its personnel.
- Damages due to circumstances beyond the control of WTC MACHINERY, LLC and in connection with fulfilling any obligation under this warranty.

This warranty is exclusive and is in lieu of all other expressed and implied warranties, including but not limited to implied warranties or merchantability and fitness for a particular purpose. WTC MACHINERY, LLC shall not be subject to any other obligations or liabilities whatsoever with respect to equipment manufactured or supplied by WTC MACHINERY, LLC, or services rendered to it.

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SECTION 1 - INTRODUCTION

This Manual covers installing, using and maintaining the Model MPP100 100-Ton Portable Pin Press.

Description

The MPP100 100-Ton Portable Pin Press provides a portable means for disassembling and reassembling crawler track chain links and related pressing jobs.

The MPP100 uses hydraulic power, and versions of the MPP100 are available with hand-powered, compressed air-powered and electrically-powered hydraulic power supplies (also know as pumps). The MPP100 is also available without a hydraulic power supply, for use with an existing pump.

Safety Statements

There are three different categories of safety statements throughout this manual -

- DANGER!** - Information about risks to life
- WARNING!** - Information about risks of injury
- CAUTION!** - Information about risks of damage to equipment.

It is the responsibility of the operator, but also of the management and supervisors, to read and understand ways to safely get the most from the MPP100 Portable Pin Press.

Cleanliness

Cleaning is component of long term maintenance of the MPP100 Portable Pin Press.

A clean piece of equipment reduces the risk of oil contamination, is more pleasant to operate, safer and easier to maintain.



WARNING!

*Altering any part of the MPP100 Portable Pin Press or its components,
or using the MPP100 Portable Pin Press in a manner other than described in this manual is at the operator's own risk.
Such alterations or uses will void the warranty against the MPP100 Portable Pin Press.*



SECTION 2 – MPP100 Portable Pin Press Specifications

DIMENSIONS

Weight (less Hydraulic Power Supply) 700 lbs (465 kg)

Width 14 inches (0,81 m)

Length..... 80 inches (2,76 m)

Height 18 inches (1,32 m)

PRESSING CAPACITY 100 Short Tons (90,9 tonnes)

CYLINDER STROKE 5 inches (127 mm) with Adjustable Screw Makeup

THROAT DIMENSIONS

Throat Width 14" (355 mm)

Throat Depth 3.4" (86 mm)

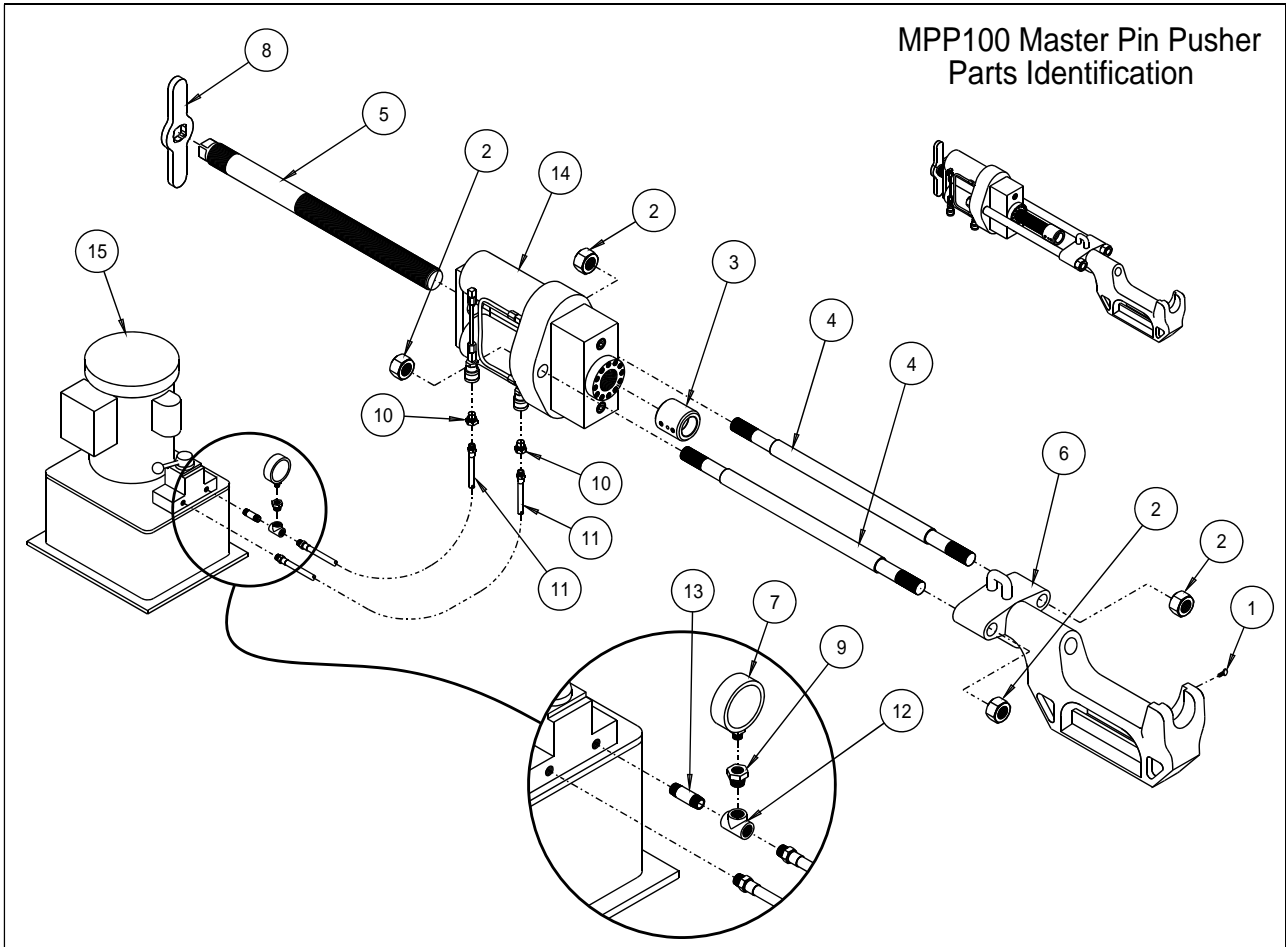
HYDRAULIC POWER SUPPLIES

Maximum Pressure (all units)..... 10,000 p.s.i. (690 bar)

	Compressed Air Power	Electric* Power	Gasoline Power	Hand Power
MPP100 Model	MPP100-A	MPP100-E	MPP100-G	MPP100
Reservoir Capacity	2 gal (7,6 l)	2 gal (7,6 l)	2 gal (7,6 l)	2¼ gal (8,5 l)
Flow @ 150 psi (10,3 bar)	480 in ³ /min (7,8 lpm)	560 in ³ /min (9,1 lpm)	560 in ³ /min (9,1 lpm)	145 in ³ /min (2,4 lpm)**
Flow @ 10000 psi (690 bar)	45 in ³ /min (0,7 lpm)	40 in ³ /min (0,6 lpm)	40 in ³ /min (0,6 lpm)	5 in ³ /min (0,08 lpm)**
Power	4 Hp (3,0 kW)	1½ Hp (1,1 kW)	3¾ Hp (2,8 kW)	-
Power Supply	62 SCFM @ 100 psi 1,8 m ³ /min @ 6,9 bar)	17 A @ 115 V 60Hz 9.0 A @ 220 V 50/60HZ	4-Cycle Petrol Engine	-
Width	12.8" (325 mm)	12.8" (325 mm)	12.8" (325 mm)	25.0" (635 mm)
Length	16.5" (419 mm)	16.5" (419 mm)	16.5" (419 mm)	11.2" (284 mm)
Height	12.3" (312 mm)	16.0" (406 mm)	18.4" (467 mm)	14.1" (358 mm)
Dry Weight	80 lb (36 kg)	96 lb (44 kg)	96 lb (44 kg)	71 lb (32 kg)

- - Also available: 10.0 Amps, 230V 60Hz, 1 Phase (MPP100-220DOM)
10.0 Amps, 220V 50Hz, 1 Phase (MPP100-220-50 and MPP100-220CE)

** - Flow based on 20 strokes per minute



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

MPP100 Models –

- 1643 – MPP100 less Hydraulics
 - Includes items 1 to 6 and item 8 (above)
- 1643A – MPP100 with Cylinder, less Pump
 - Includes items 1 to 6, item 8 and item 14
- MPP100 – MPP100 with Hand Pump
 - Includes items 1 to 14 and Hand Pump (item 15)
- MPP100-A – MPP100 with Compressed Air Powered Pump
 - Includes items 1 to 14 and Compressed Air Powered Pump (item 15)
- MPP100-E – MPP100 with 115 V Electric Powered Pump
 - Includes items 1 to 14 and 115 Volt 60 Hertz Electric Powered Pump (item 15)
- MPP100-220 – MPP100 with 220V 50Hz Powered Electric Pump (Outside North America)
 - Includes items 1 to 14 and 220 Volt 50 Hertz Electric Powered Pump (item 15)
- MPP100-220 – MPP100 with 220V 60Hz Electric Powered Pump (Inside North America)
 - Includes items 1 to 14 and 220 Volt 60 Hertz Electric Powered Pump (item 15)
- MPP100-G – MPP100 with Gasoline (Petrol) Powered Pump
 - Includes items 1 to 14 and Gasoline Powered Pump (item 15)



MPP100 Part Listing – Item Numbers Refer to Parts Identification Drawing (page 3)

Item No.	Part Number	Description	No Pump			Hand Pump		Electric Pump - 120 V 60 Hz			Electric Pump - 220 V 50 Hz		Electric Pump - 220 V 60 Hz	Compressed Air Powered	Gasoline Powered
			1643	1643A	1643ASPX	MPP100	MPP100-SPX	MPP100-E	MPP100-ESPX	MPP100-ESPX2	MPP100-220	MPP100-220 CE	MPP100-220DOM	MPP100-A	MPP100-G
1	017010	Thumb Screw	1	1	1	1	1	1	1	1	1	1	1	1	1
2	024021	Tie Rod Nut	4	4	4	4	4	4	4	4	4	4	4	4	4
3	025545	Screw Coupling	1	1	1	1	1	1	1	1	1	1	1	1	1
4	031781	Tie Rod	2	2	2	2	2	2	2	2	2	2	2	2	2
5	032699	Ram Screw	1	1	1	1	1	1	1	1	1	1	1	1	1
6	050499-WH2-1	"C" Frame	1	1	1	1	1	1	1	1	1	1	1	1	1
7	10492	Pressure Gauge	-	-	-	1	1	1	1	1	1	1	1	1	1
8	303785	Ram Screw Crank	1	1	1	1	1	1	1	1	1	1	1	1	1
9	34-1210	Hydraulic Fitting	-	-	-	1	1	1	1	1	1	1	1	1	1
10	34-2003	Hydraulic Coupling	-	-	-	2	2	2	2	2	2	2	2	2	2
11	34-2004	Hydraulic Hose	-	-	-	2	2	2	2	2	2	2	2	2	2
12	34-2006	Tee Fitting	-	-	-	1	1	1	1	1	1	1	1	1	1
13	34-2007	Pipe Nipple	-	-	-	1	1	1	1	1	1	1	1	1	1
14	B2857	Hydraulic Cylinder	-	1	-	1	-	1	1	-	1	1	1	1	1
	RT1004	SPX Hydraulic Cylinder	-	-	1	-	1	-	-	1	-	-	-	-	-
15	34-2012	Pump Base - Hand Pump	-	-	-	1	-	-	-	-	-	-	-	-	-
	P460D	SPX Pump Base - Hand Pump	-	-	-	-	1	-	-	-	-	-	-	-	-
	34-2214	Pump Base - 120 V 60 Hz	-	-	-	-	-	1	-	-	-	-	-	-	-
	PE554	SPX Pump Base - 120V 60 Hz	-	-	-	-	-	-	1	1	-	-	-	-	-
	34-2008-220-60	Pump Base - 220 V 60 Hz	-	-	-	-	-	-	-	-	-	1	-	-	-
	34-2074	Pump Base - 220 V 50 Hz CE	-	-	-	-	-	-	-	-	1	-	-	-	-
	34-2085	Pump Base - 220 V 50 Hz	-	-	-	-	-	-	-	1	-	-	-	-	-
	34-2174MPP	Pump Base - Air Powered	-	-	-	-	-	-	-	-	-	-	-	1	-
34-2192-MPP	Pump Base - Gasoline Powered	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Rev C – 10.07.14 – Add MPP100-G

SECTION 3 - SETUP -

A) Assembly

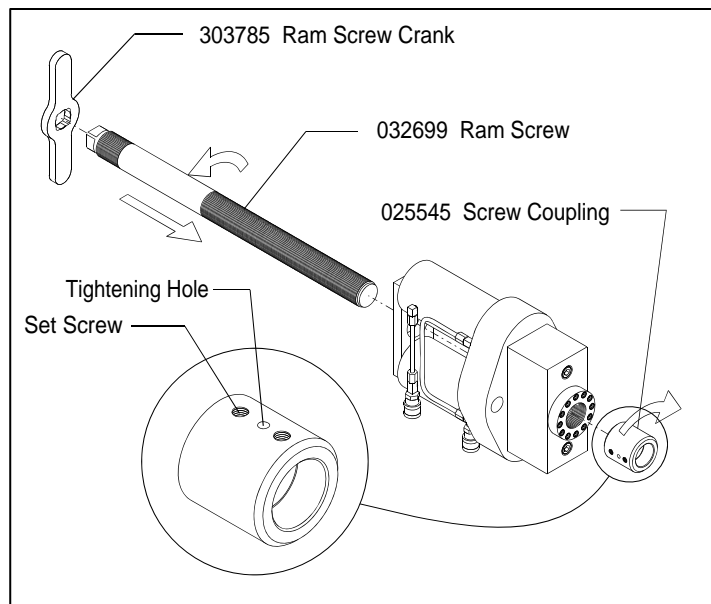
! WARNING!

*Individual parts of the MPP100 are heavy -
The B2857 Hydraulic Cylinder weighs 315 lbs (144 kg) and the 050499-WH2-1 "C Frame weighs 175 lbs (80 kg)
To avoid injury, do not lift by hand - use properly rated lifting gear to position MPP100 parts.
Always remain clear of suspended parts to avoid the risk of injury from falling parts.*

The MPP100 Portable Pin Press is disassembled for shipping. Unpack and inspect the MPP100 parts - report missing or damages parts immediately. Locate the tools needed to assemble the MPP100 –

- 2¼" wrench or 2¼" Socket and Socket Wrench
- 5/16" Hex Key (Allen wrench)
- Lifting gear rated for 800 lbs (360 kg)

Locate the B2857 Hydraulic Cylinder, the 032699 Ram Screw, the 303785 Ram Screw Crank and the 025545 Screw Coupling.

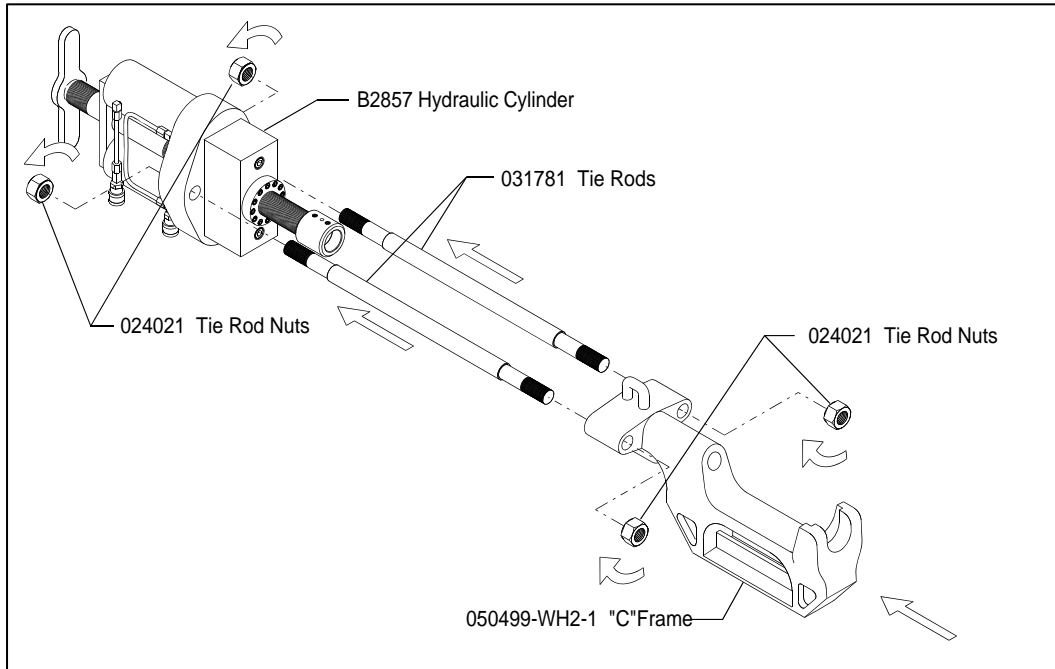


Insert the 032699 Ram Screw into the B2857 Hydraulic Cylinder, and thread into the Cylinder, using the 303785 Ram Screw Crank.

Thread the 025545 Screw Coupling onto the Ram Screw –a small rod passed through the Screw Coupling tightening hole can make tightening easier. Use a 5/16" hex key to tighten the Screw Coupling set screw, locking the Screw Coupling to the Ram Screw.

A) Assembly (continued)

Now locate the 050499-WH2-1 "C" Frame, the two 031781 Tie Rods, and the four 024021 Tie Rod Nuts.

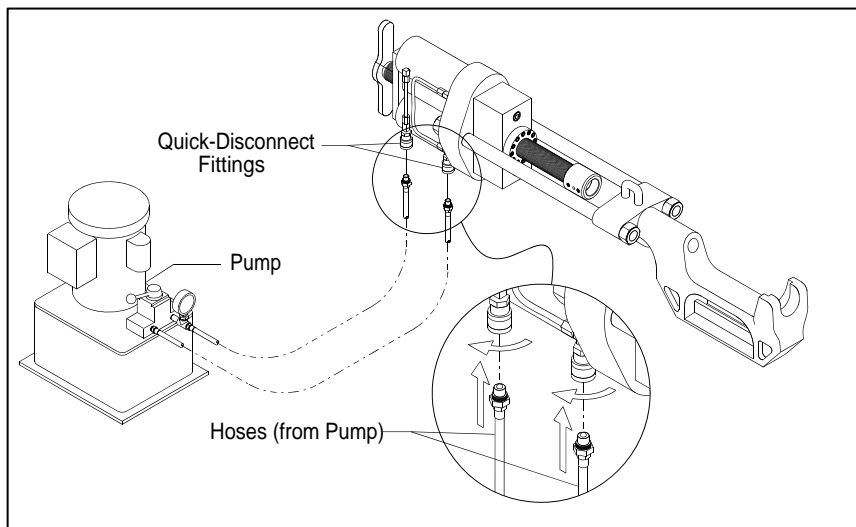


Insert the Tie Rods into the holes of the Hydraulic Cylinder. Thread two of the Tie Rod Nuts onto the Tie Rods. Insert the other end of the Tie Rods in the holes of the 050499-WH2-1 "C" Frame, and thread on the remaining two Tie Rod Nuts onto the Tie Rods. Using a 2¼" wrench or 2¼" socket and socket wrench, tighten the four Tie Rod Nuts to a minimum torque of 300 ft-lb (410 N-m.)

B) PUMP CONNECTIONS

Place the hydraulic power supply (or pump) near the assembled MPP100. Unpack the two hydraulic hoses from the pump. Connect the hose ends to the quick-disconnect fittings on the MPP100 Hydraulic Cylinder, as shown below. The hose attached to the pump's Pressure Gauge connects to the back Hydraulic Cylinder extend fitting (the fitting farthest from the "C" Frame.)

Insert the hose ends into the quick-disconnect fittings, and turn the knurled cases of the quick-disconnect fittings until they are completely tight.



WARNING!

To avoid the risk of trapped oil and excessive pressure, always check that both of the Hydraulic Cylinder quick-disconnect fittings are completely tightened before using the MPP100.

C) HYDRAULIC OIL

Fill the pump reservoir of the MPP100 Portable Pin Press. The hand pump reservoir holds 2¼ gallons (8,5 liters) of hydraulic fluid. The reservoirs of electrically powered pump and air powered pump holds 2 gallons (7,6 liters.)

The recommended hydraulic fluid is HA57, available from WTC Machinery. Comparable hydraulic fluids have a viscosity that meets ISO 68, or an SUS from 290 to 350 at 100°F.

The oil should withstand pressures to 10,000 p.s.i. and contain anti-wear, anti-corrosion, and anti-foam additives suitable for use with hydraulic pumps.

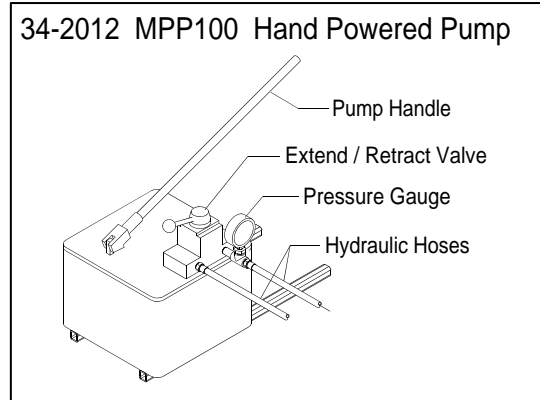
Some brands to use as a guide are:

Manufacturer	Name of Fluid	Product Code
Conoco	Super Hydraulic 46	47450
Mobil	DTE Excel 68	603936
Shell	Tellus Plus 68	65211
Std. Oil	Chevron Clarity AW ISO 68	230340
Texaco	Rando HD68	1659

D) CONNECTING PUMPS

Hand Pump –

The hand pump version of the MPP100 requires no power connection.



Electrically Powered Pumps –

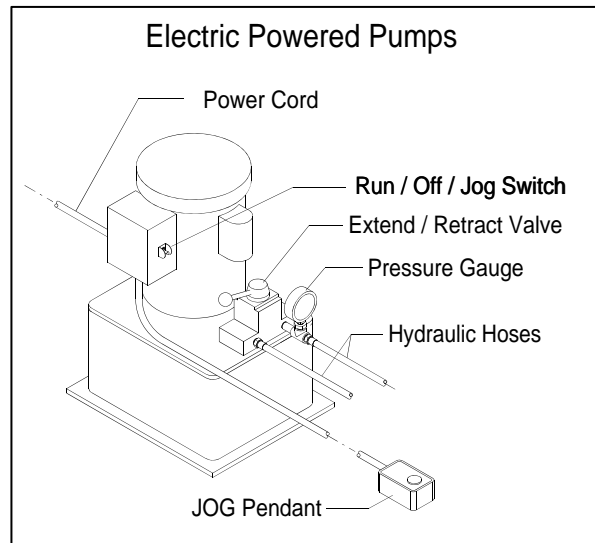


Electricity kills! All electrical work should only be done by qualified personnel. All electrical connections must be made in accordance with the U.S.A. National Electrical Codes. Outside the U.S.A., local codes and ordinances must be followed and adhered to. Always follow company Lockout/Tagout Program. If none exists, we recommend starting one.

The electrically powered pump needs a source of electrical power - if electrical codes permit, connect the pump to the electrical supply using a flexible cable, plug and socket. This allows the MPP100 to be easily disconnected for storage when not in use.

The electrical supply to the MPP100 should have a lockable disconnect (usually a shutoff or a plug and socket set) and over-current protection (usually fuses or circuit breakers.) These devices should be sized for the voltage and current supplied to the Portable Pin Press pump.

Verify the voltage, frequency and current of the supply match the voltage, frequency and current draw of the MPP100, as shown on the tag attached to the pump power cable.



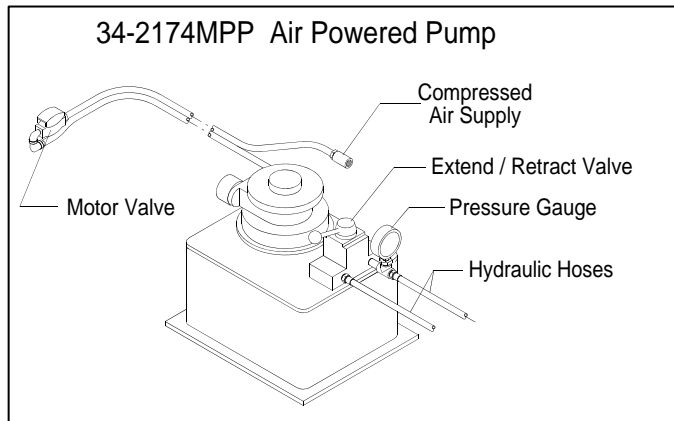
MPP100 Model	Voltage	Frequency	Current
MPP100-E	120 Volts	60 Hz	25 Amperes
MPP100-ESPX2	120 Volts	60 Hz	25 Amperes
MPP100-220	220 Volts	50 Hz	13 Amperes
MPP100-220CE	220 Volts	50 Hz	13 Amperes
MPP100-220DOM	220 Volts	60 Hz	13 Amperes

C) CONNECTING PUMPS (CONTINUED)

Air Powered Pump –

The air powered MPP100 (MPP100-A) needs a supply of compressed air – the supply should have a minimum pressure of 100 psi (6,9 bar) and a minimum flow of 62 SCFM (1,8 m³/min). The supply should include a water trap, filter and oil lubricator.

Connect the air supply to the 3/8" NPT Compressed Air Supply fitting.



E) STARTING THE HYDRAULIC PUMP

Hand Pump –

Once the pump is connected to the Hydraulic Cylinder and the reservoir is filled, move the Extend / Retract Valve to the Extend position, and pump the Pump Handle to fully extend the Hydraulic Cylinder. Shift the Extend / Retract Valve to the retract position and pump the Pump Handle to fully retract the Hydraulic Cylinder. Again extend and retract the Hydraulic Cylinder to remove all trapped air from the MPP100 hydraulic system.

Electrical Powered Pumps –

Once all electrical connections are complete, and the reservoir is full, shift the Extend / Retract Valve to the center position. Locate the Start push button on the Jog Pendant. Jog the motor by briefly pressing the START push button. Continue to jog the motor until the pump fills with oil (the noise of the pump will become lower pitched and less loud.)

Move the Extend / Retract Valve to the Extend position. Press and hold the START button to fully extend the Hydraulic Cylinder. Shift the Extend / Retract Valve to the retract position and fully retract the Hydraulic Cylinder. Again extend and retract the Hydraulic Cylinder to remove all trapped air from the MPP100 hydraulic system.

Air Powered Pump –

Once compressed air connections are made and the reservoir is full, shift the Extend / Retract Valve to the center position. Locate the Motor Valve. Jog the motor by pressing and releasing the Motor Valve. Continue to jog the motor until the pump fills with oil (the noise of the pump will become lower pitched and less loud.)

Move the Extend / Retract Valve to the Extend position. Press and hold the Motor Valve and fully extend the Hydraulic Cylinder. Shift the Extend / Retract Valve to the retract position and fully retract the Hydraulic Cylinder. Again extend and retract the Hydraulic Cylinder to remove all trapped air from the MPP100 hydraulic system.

Once all air is removed from the hydraulic system, check the fluid level of the reservoir. If needed, add hydraulic fluid. The MPP100 Portable Pin Press is ready for operation.

SECTION 4 - USING THE MPP100 Portable Pin Press

! WARNING!

The MPP100 Portable Pin Press uses high pressure hydraulics, which present the risk of flying debris and oil injection. Before using the MPP100, always inspect hydraulic components (especially the hydraulic cylinder tubes) for leaks, bends, breaks, wear spots or other damage. Always replace damaged or worn parts with original manufacturer parts.

! WARNING!

The MPP100 Portable Pin Press generates high forces, which present a risk of crush damage and flying debris. The MPP100 Portable Pin Press should be used only by a trained operator familiar with the equipment and its use. Always align the MPP100 and tooling so the pressing force is centered and in line with and track components. Always wear eye protection and avoid loose clothing when operating the MPP100. Always keep clear of moving parts when the MPP100 is in use.

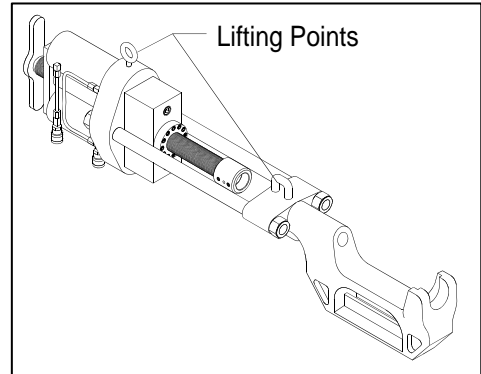
A) LIFTING THE MPP100

! WARNING!

Always use lifting gear rated for the applied load. Inspect lifting gear before use and replace damaged gear. Always remain clear of lifted loads to avoid the risk of being trapped by falling or shifting loads.

The MPP100 is lifted into position to work in the track chain. This is usually done with a service truck jib crane, or service shop overhead crane, and lifting chain or wire rope with hook ends. The crane and all lifting gear should be rated for a minimum load of 1000 lbs (455 kg.)

Suspend the chain or wire rope from the crane, and attach the end hooks to the MPP100's lifting points. Lift and level the MPP100.



B) TRACK CHAIN PREPARATION

Move the track chain to a position where the Master Pin has adequate clearance. There should be enough open space under the master pin for the MPP100 "C" Frame assembly, and the space between the inboard end of the Master Pin and the crawler should be at least the length of the Master Pin plus 4 inches (102 mm).

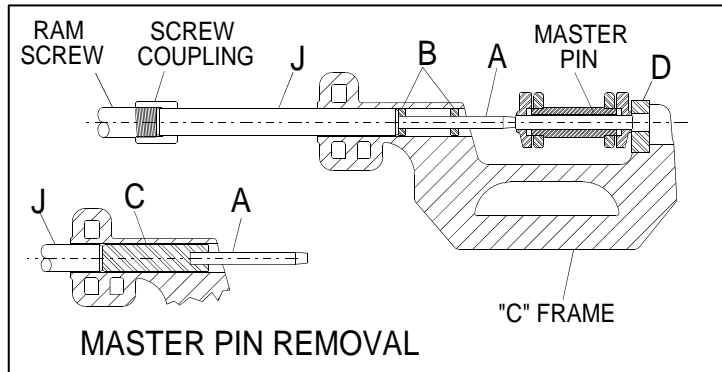
Once the Master Pin is located, remove tension from the track chain, and support the track chain on either side of the master link, so it doesn't unexpectedly drop when the Master Pin is removed.

C) MASTER PIN REMOVAL

! WARNING!

The MPP100 Portable Pin Press generates high forces, which present a risk of crush damage and flying debris. Always wear eye protection and avoid loose clothing when operating the MPP100. Always keep clear of moving parts when the MPP100 is in use.

NOTE: Refer to the tooling charts to find the tooling for each specific track chain. Refer to drawing (below) for tool components listed in the tooling charts.



1. Install the Aligning Adapter (D) into the "C" Frame and secure with the thumb screw.
2. Install the appropriate Rear Forcing Pin (J) into the bore of the Screw Coupling.
3. If listed, install the Pilot Pin (C) into the "C" Frame bore against the Rear Forcing Pin (J). Install the Forcing Pin (A) into the Pilot Pin bore, with the long taper directed to the Master Pin.

If the Pilot Pin is not listed, place the Forcing Pin (A) into the Aligning Bushings (B), and insert this into the bore of the "C" Frame until it butts against the Rear Forcing Pin (J).

! CAUTION!

To help prevent damage to the master links, always place the Forcing Pin's long taper towards the Master Pin.

4. Position the MPP100 Portable Pin Press on the track chain, in line with the Master Pin.
5. Turn the Ram Screw Crank until the Forcing Pin (A) touches the outboard end of the Master Pin, and the Aligning Adapter (D) touches the inboard Master Link.

Attach the hydraulic pump, and advance the ram to remove the master pin. As the master pin begins to push out, be sure it is centered on the Aligning Adapter (D), and that it clears the center of the Aligning Adapter.

If Aligning Bushings (B) are used on the Forcing Pin (A), remove the Aligning Bushings (B) before they are trapped between the Rear Forcing Pin (J) and the Master Link.

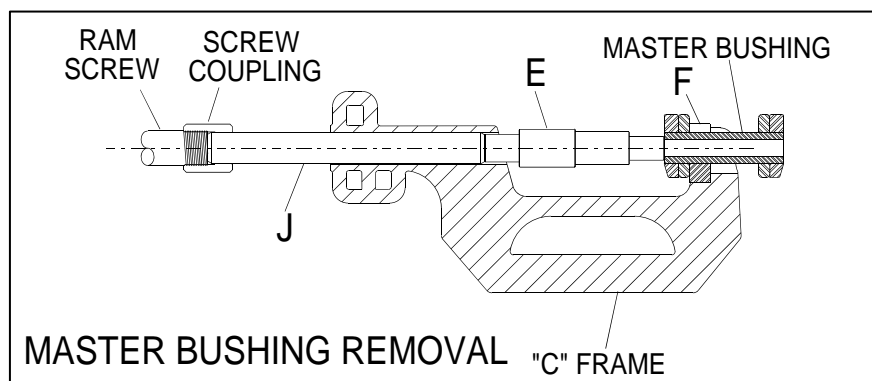
! CAUTION!

To help prevent the risk of damage to the master links, always remove the Aligning Bushings (B) before the final push is made.

D) MASTER BUSHING REMOVAL**WARNING!**

*The MPP100 Portable Pin Press generates high forces, which present a risk of crush damage and flying debris.
Always wear eye protection when operating the MPP100.
Always keep clear of moving parts when the MPP100 is in use.*

NOTE: Refer to the tooling charts to find the tooling needed for your specific application. Refer to drawing (below) for tool components listed in the tooling charts.



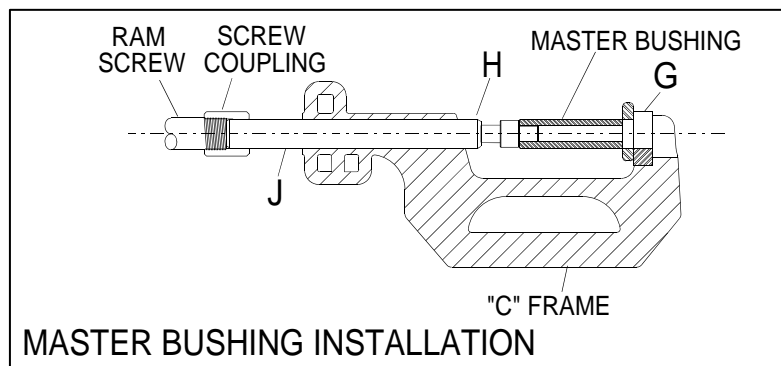
1. Install the Bushing Adapter (F) into the "C" Frame and secure with the thumb screw.
2. Use the same Rear Forcing Pin (J) as used on the Master Pin removal, in the Screw Coupling.
3. Position the MPP100 Portable Pin Press so the Bushing Adapter (F) is between the Master Links, and the Master Bushing fits into the Bushing Adapter (F).
4. Insert the Bushing Pusher (E) into the bore of the Master Bushing.
Note: Each end of the Bushing Pusher (E) has a different diameter.
Insert the end of the Bushing Pusher (E) that provides the closest fit in the Master Bushing.
5. Turn the Ram Screw Crank until the Rear Forcing Pin (J) touches the outboard end of the Bushing Pusher (E), and the Bushing Adapter (F) touches the outboard Master Link.

Attach the hydraulic pump, and advance the ram to press the Master Link off of the Master Bushing.
6. Reposition the MPP100 on the other side of the track chain, and repeat Steps 3 through 5 to press off the second Master Link.

E) MASTER BUSHING INSTALLATION**WARNING!**

*The MPP100 Portable Pin Press generates high forces, which present a risk of crush damage and flying debris.
Always wear eye protection when operating the MPP100.
Always keep clear of moving parts when the MPP100 is in use.*

NOTE: Refer to the tooling charts to find the tooling needed for your specific application. Refer to drawing (below) for tool components listed in the tooling charts.



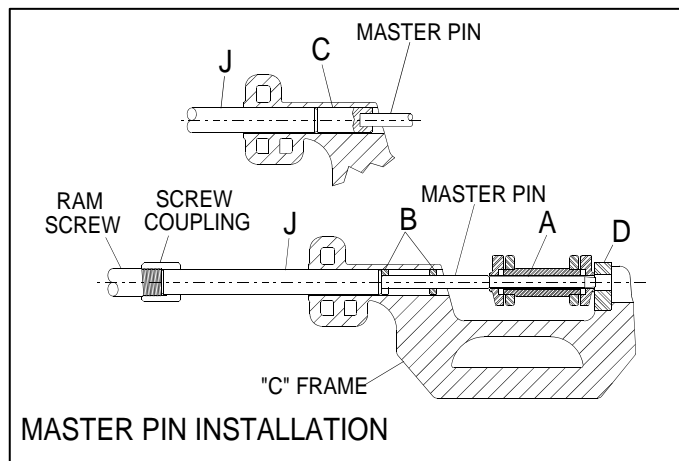
1. Install the Rear Bushing Assembly Plate (G) into the "C" Frame and secure with the thumb screw.
2. Use the same Rear Forcing Pin (J) as used on the Master Pin removal, in the Screw Coupling.
3. Position the Master Bushing and one of the Master Links, as shown above.
4. Insert the Bushing Installer (H) into the Master Bushing.
Note: Each end of the Bushing Installer (H) has a different diameter.
Insert the end of the Bushing Installer (H) that gives the closest fit in the Master Bushing.
5. Turn the Ram Screw Crank until the Rear Forcing Pin (J) touches the outboard end of the Bushing Installer (H), and the Rear Bushing Assembly Plate (G) touches the Master Link.
6. Attach the hydraulic pump, and advance the ram to press the Master Bushing into the Master Link.
7. Position the MPP100 Portable Pin Press on the other side of the track. Place the other Master Link against the Master Bushing, and press onto the Master Bushing.

Important: The two Master Links must be aligned with each other before pressing onto the Master Bushing. The Master Links can be aligned by inserting the listed Forcing Pin (A) in the pin end of the Master Links.

F) MASTER PIN INSTALLATION**WARNING!**

The MPP100 Portable Pin Press generates high forces, which present a risk of crush damage and flying debris. Always wear eye protection when operating the MPP100. Always keep clear of moving parts when the MPP100 is in use.

NOTE: Refer to the tooling charts to find the tooling needed for your specific application. Refer to drawing (below) for tool components listed in the tooling charts.



1. Position the track chain on the tractor. Slip the listed Forcing Pin (A) into the track's master joint to hold the track together temporarily.
2. Install the Aligning Adapter (D) into the "C" Frame and secure with the thumb screw.
3. Use the same Rear Forcing Pin (J) as used on the Master Pin removal, in the Screw Coupling.
4. Install the Master Pin with the Pilot Pin (C) or the Aligning Bushings (B) into the "C" Frame.
5. Position the MPP100 Portable Pin Press on the the track chain.
6. Turn the Ram Screw Crank until the Master Pin touches the outboard Master Link, and the Aligning Adapter (D) touches the inboard Master Link.

Attach the hydraulic pump, and advance the ram to install the Master Pin. As the Master Pin begins to enter the inboard Master Link, be sure it is centered on the link bore.

If Aligning Bushings (B) are used on the Master Pin, remove the Aligning Bushings (B) before they are trapped between the Rear Forcing Pin (J) and the Master Link.

**CAUTION!**

To help prevent the risk of damage to the master links, always remove the Aligning Bushings (B) before the final push is made.

7. Continue pressing until the Master Pin is completely installed.

SECTION 5 - PREVENTATIVE MAINTENANCE

Hydraulic Oil and Filters-

The pump's hydraulic fluid should be changed regularly. A reasonable plan is to schedule a fluid change once every twelve months, although the oil should be checked occasionally before this. If the hydraulic fluid shows dirt, moisture or discoloration, changing more often is a good idea.

To drain the hydraulic fluid, place a 3 gallon (11 liter) drain pan or other collection device beneath the pump's Hydraulic Reservoir's drain plug and remove the drain plug. While the hydraulic fluid drains, inspect the drain plug for metal fragments and clean if needed.

Once all of the hydraulic fluid has drained, remove the cover from the Hydraulic Reservoir, and thoroughly clean the inside of the reservoir. Inspect the inlet strainer for any tears or holes – replace the strainer if damaged, or clean the existing strainer.

With the drain plug, strainer and cover re-installed, fill the hydraulic reservoir with fresh hydraulic fluid to the top of the sight gauge (see page 5 for hydraulic fluid recommendations.)

Hydraulic Fittings and Equipment -

Look for loose, worn, damaged or leaking parts. Check all hydraulic fittings for tightness at regular intervals. Inspect hydraulic equipment for leaks, and loose mounting hardware. Replace any damaged parts

Hydraulic Hoses -

Occasionally inspect the hydraulic hoses for leaks, kinks, frays or cracks. Replace damaged hoses.

“C”-Frame -

Regularly inspect the “C” Frame for cracks, bends or mutilation. Replace it if damaged.

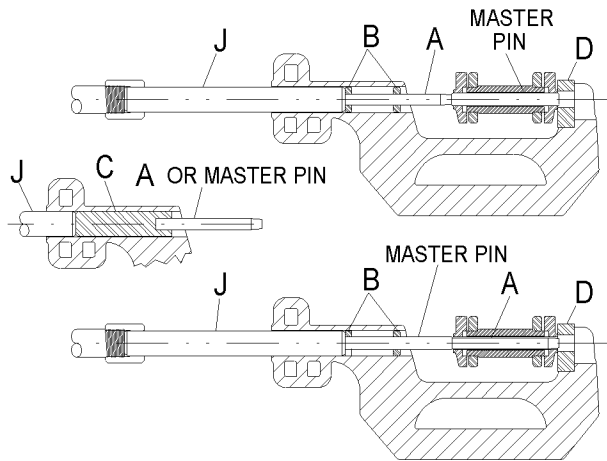
Tie Rods and Tie Rod Nuts –

Regularly inspect the Tie Rods for bends, cracks or other damage. Replace damaged Tie Rods. Also regularly inspect the Tie Rod Nuts for tightness. Tighten loose Tie Rod Nuts to a minimum torque of 300 ft-lb (410 N-m.)

Tooling –

Inspect all tooling for cracks, bends, mushrooming or other damage before use.
Replace damaged tooling

MASTER PIN REMOVAL

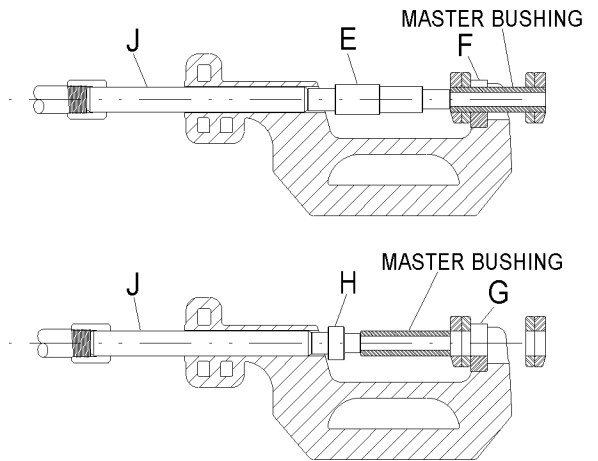


MASTER PIN INSTALLATION

⚠ WARNING: To help prevent personal injury, do not use this tooling beyond its maximum working force of 100 tons (90.9 tonnes)

IMPORTANT: To help prevent equipment damage, remove aligning bushings ("B") if used, BEFORE the final push is made.

MASTER BUSHING REMOVAL



MASTER BUSHING INSTALLATION

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WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CASE	200		5.875	5.220	0.992	200281	Not Req'd	Not Req'd	25505
CASE	300		5.875	5.220	0.992	200281	Not Req'd	Not Req'd	25505
CASE	310		5.875	5.220	0.992	200281	Not Req'd	Not Req'd	25505
CASE	320		5.875	5.220	0.992	200281	Not Req'd	Not Req'd	25505
CASE	350		5.875	5.22	0.993	200281	Not Req'd	Not Req'd	25505
CASE	350		5.875	5.220	0.992	200281	Not Req'd	Not Req'd	25505
CASE	400		5.875	5.220	0.992	200281	Not Req'd	Not Req'd	25505
CASE	420		5.875	5.220	0.992	200281	Not Req'd	Not Req'd	25505
CASE	450		5.75	5.38	1.187	25498	Not Req'd	Not Req'd	25504
CASE	450		5.875	5.375	1.058	200281	Not Req'd	Not Req'd	25505
CASE	500		5.875	5.220	0.992	200281	Not Req'd	Not Req'd	25505
CASE	520		5.875	5.220	0.992	200281	Not Req'd	Not Req'd	25505
CASE	550		6.29	6.575	1.129	200281	Not Req'd	Not Req'd	25504
CASE	600		5.875	5.375	1.063	200281	Not Req'd	Not Req'd	25505
CASE	600		5.875	5.375	1.058	200281	Not Req'd	Not Req'd	25505
CASE	650		6.735	7.224	1.318	25499	Not Req'd	Not Req'd	25502

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
200	32435	1.005	1.500	35199	32437	N/A	35204	33934	None
300	32435	1.005	1.500	35199	32437	N/A	35204	33934	None
310	32435	1.005	1.500	35199	32437	N/A	35204	33934	None
320	32435	1.005	1.500	35199	32437	N/A	35204	33934	None
350	32435	N/A	1.5	35199	32437	35202	35204	33934	None
350	32435	1.005	1.500	35199	32437	N/A	35204	33934	None
400	32435	1.005	1.500	35199	32437	N/A	35204	33934	None
420	32435	1.005	1.500	35199	32437	N/A	35204	33934	None
450	32435	N/A	1.75	35199	33471	35202	EITHER	33934	None
450	32435	1.078	1.625	35199	33471	N/A	35204	33934	None
500	32435	1.005	1.500	35199	32437	N/A	35204	33934	None
520	32435	1.005	1.500	35199	32437	N/A	35204	33934	None
550	32435	N/A	1.966	35199	35205	35202	EITHER	33934	None
600	32435	N/A	1.625	35199	33471	35202	35204	33934	None
600	32435	1.078	1.625	35199	33471	N/A	35204	33934	None
650	22471	N/A	2.119	35199	35205	25562	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CASE	650		6.735	7.224	1.318	25499	Not Req'd	Not Req'd	25502
CASE	750		6.25	6.94	1.374	25499	Not Req'd	Not Req'd	25502
CASE	750	LDR	6.250	6.940	1.370	25499	Not Req'd	Not Req'd	25502
CASE	800		6.25	6.5	1.248	25498	Not Req'd	Not Req'd	25504
CASE	850		6.25	6.94	1.374	25499	Not Req'd	Not Req'd	25502
CASE	850		6.250	6.940	1.370	25499	Not Req'd	Not Req'd	25502
CASE	1000		6.25	6.5	1.248	25498	Not Req'd	Not Req'd	25504
CASE	1150	Recessed	6.25	6.94	1.374	25499	Not Req'd	Not Req'd	25502
CASE	1150	Sealed	6.25	6.94	1.374	25499	Not Req'd	Not Req'd	25502
CASE	1150		6.250	6.940	1.370	25499	Not Req'd	Not Req'd	25502
CASE	1450	Sealed	8.02	9.06	1.753	25548	22777	22751	Not Req'd
CASE	1450		8.020	9.250	1.752	25548	22777	22751	Not Req'd
CASE	1550		8.02	9.06	1.753	25548	22777	22751	Not Req'd
CASE	1000D		6.250	6.940	1.370	25499	Not Req'd	Not Req'd	25502
CASE	1000HD		6.25	6.94	1.374	25499	Not Req'd	Not Req'd	25502
CASE	1000HD		6.250	6.940	1.370	25499	Not Req'd	Not Req'd	25502

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
650	22471	N/A	2.119	35199	35205	25562	25546	33936	None
750	33472	N/A	1.995	35199	35205	35202	25546	33934	None
750	32437	1.390	1.997	35199	35205	N/A	25546	33934	None
800	32435	N/A	1.871	35199	33471	35202	EITHER	33934	None
850	33472	N/A	2	35199	35205	25562	25546	33934	None
850	32437	1.390	1.997	35199	35205	N/A	25546	33934	None
1000	32435	N/A	1.871	35199	33471	35202	EITHER	33934	None
1150	33472	N/A	1.995	35199	35205	35202	25546	33934	None
1150	33472	N/A	2	35199	35205	25562	25546	33934	None
1150	32437	1.390	1.997	35199	35205	N/A	25546	33934	None
1450	32441	N/A	2.62	35199	22769	25562	25546	33934	None
1450	33471	1.776	2.619	32434	22769	25563	25546	33934	None
1550	32441	N/A	2.62	35199	22769	25562	25546	33934	None
1000D	32437	1.390	1.997	35199	35205	N/A	25546	33934	None
1000HD	33472	N/A	1.995	35199	35205	35202	25546	33934	None
1000HD	32437	1.390	1.997	35199	35205	N/A	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CASE	1150 B		6.680	8.100	1.495	25500	22779	22779	Not Req'd
CASE	1150B		6.678	8.1	1.5	25500	Not Req'd	22777	Not Req'd
CASE	1150D		6.678	8.11	1.44	25500	Not Req'd	22779	Not Req'd
CASE	1150E		6.678	8.11	1.44	25500	Not Req'd	22779	Not Req'd
CASE	1155D		6.678	8.11	1.44	25500	Not Req'd	22779	Not Req'd
CASE	1155E		6.678	8.11	1.44	25500	Not Req'd	22779	Not Req'd
CASE	1450B	Sealed	8.02	9.06	1.753	25548	22777	22751	Not Req'd
CASE	1450B	SALT	8.02	9.06	1.753	25548	22777	22751	Not Req'd
CASE	1455B	SALT	8.02	9.06	1.753	25548	22777	22751	Not Req'd
CASE	1455B	Sealed	8.02	9.06	1.753	25548	22777	22751	Not Req'd
CASE	310G		5.875	5.22	0.993	200281	Not Req'd	Not Req'd	25505
CASE	350B		5.875	5.219	0.994	200281	Not Req'd	Not Req'd	25505
CASE	450A		6	6.54	1.25	25498	Not Req'd	Not Req'd	25502
CASE	450B		6	6.54	1.25	25498	Not Req'd	Not Req'd	25502
CASE	450C	SALT	6	6.46	1.129	200281	Not Req'd	Not Req'd	25504
CASE	450C	Sealed	6	6.457	1.129	200281	Not Req'd	Not Req'd	25504

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
1150 B	32437	1.515	2.188	35199	35205	N/A	25546	33936	None
1150B	32437	N/A	2.185	35199	35205	25562	25546	33936	None
1150D	33472	N/A	2.314	35199	35205	25562	25546	33936	None
1150E	33472	N/A	2.314	35199	35205	25562	25546	33936	None
1155D	33472	N/A	2.314	35199	35205	25562	25546	33936	None
1155E	33472	N/A	2.314	35199	35205	25562	25546	33936	None
1450B	32441	N/A	2.62	35199	22769	25562	25546	33934	None
1450B	32441	N/A	2.62	35199	22769	25562	25546	33934	None
1455B	32441	N/A	2.62	35199	22769	25562	25546	33934	None
1455B	32441	N/A	2.62	35199	22769	25562	25546	33934	None
310G	32435	N/A	3.18	32434	22771	25561	25546	33934	None
350B	32435	N/A	3.359	32434	31658	25561	25546	33934	None
450A	32435	N/A	4.31	35199	Not Req'd	25561	25546	33934	None
450B	32435	N/A	4.31	35199	Not Req'd	25561	25546	33934	None
450C	32435	N/A	1.85	35199	33471	35202	EITHER	33934	None
450C	32435	N/A	1.85	35199	33471	35202	EITHER	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CASE	450HD		5.875	5.375	1.184	25498	Not Req'd	Not Req'd	25504
CASE	455C		6	6.46	1.129	200281	Not Req'd	Not Req'd	25504
CASE	550E		6.29	6.575	1.129	200281	Not Req'd	Not Req'd	25504
CASE	550G		6.29	6.575	1.129	200281	Not Req'd	Not Req'd	25504
CASE	850D		6.25	7.22	1.318	25499	Not Req'd	Not Req'd	25502
CASE	850D		6.735	7.224	1.318	25499	Not Req'd	Not Req'd	25502
CASE	850E		6.25	7.22	1.318	25499	Not Req'd	Not Req'd	25502
CASE	850E		6.735	7.224	1.318	25499	Not Req'd	Not Req'd	25502
CASE	850G		6.735	7.224	1.318	25499	Not Req'd	Not Req'd	25502
CASE	850H		6.735	7.224	1.318	25499	Not Req'd	Not Req'd	25502
CASE	850K		6.735	7.224	1.318	25499	Not Req'd	Not Req'd	25502
CASE	855D		6.25	7.22	1.318	25499	Not Req'd	Not Req'd	25502
CASE	855D		6.735	7.224	1.318	25499	Not Req'd	Not Req'd	25502
CASE	M3		5.875	5.220	0.992	200281	Not Req'd	Not Req'd	25505
CATERPILLAR	215	EXC (9/16" Bolt)	6.735	6.370	1.315	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	215	EXC (5/8" Bolt)	6.735	7.22	1.315	25499	Not Req'd	Not Req'd	25502

WTC Machinery
MPP 100 Tooling Chart

			BUSHING REMOVAL		BUSHING INSTALL				
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
450HD	32435	1.195	1.750	35199	33471	N/A	EITHER	33934	None
455C	32435	N/A	1.85	35199	33471	35202	EITHER	33934	None
550E	32435	N/A	1.996	35199	35205	35202	25546	33934	None
550G	32435	N/A	1.996	35199	35205	35202	25546	33934	None
850D	22471	N/A	1.995	35199	35205	35202	25546	33936	None
850D	22471	N/A	1.995	35199	35205	35202	25546	33936	None
850E	22471	N/A	2.119	35199	35205	25562	25546	33936	None
850E	22471	N/A	2.119	35199	35205	25562	25546	33936	None
850G	22471	N/A	2.119	35199	35205	25562	25546	33936	None
850H	22471	N/A	2.119	35199	35205	25562	25546	33936	None
850K	22471	N/A	2.119	35199	35205	25562	25546	33936	None
855D	22471	N/A	2.119	35199	35205	25562	25546	33936	None
855D	22471	N/A	2.119	35199	35205	25562	25546	33936	None
M3	32435	1.005	1.500	35199	32437	N/A	35204	33934	None
215	22471	N/A	2.120	35199	35205	25562	25546	33934	None
215	22471	N/A	2.12	35199	35205	25562	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CATERPILLAR	215		6.750	7.000	1.314	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	219		7.480	8.120	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	225	EXC	6.735	7.22	1.315	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	225		6.750	7.000	1.314	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	227		7.985	9.060	1.752	25548	22777	22751	Not Req'd
CATERPILLAR	229		7.985	9.060	1.752	25548	22777	22751	Not Req'd
CATERPILLAR	235	EXC	7.985	9.06	1.752	25548	22777	22751	Not Req'd
CATERPILLAR	235		8.500	9.813	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	245		10.250	11.260	2.252	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	311		6.750	7.010	1.321	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	312	EXC	6.75	7.01	1.321	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	315		7.480	8.150	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	317		7.480	8.150	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	318		7.480	8.150	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	320	EXC	7.480	8.150	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	320	EXC	7.48	8.15	1.442	25500	Not Req'd	22779	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
215	33472	1.330	1.993	35199	35205	N/A	25546	33936	None
219	33472	N/A	2.312	35199	35205	25562	25546	33936	None
225	22471	N/A	2.118	35199	35205	25562	25546	33936	None
225	33472	1.330	1.993	35199	35205	N/A	25546	33936	None
227	32441	N/A	2.621	35199	22769	25562	35204	33934	None
229	32441	N/A	2.621	35199	22769	25562	35204	33934	None
235	32441	N/A	2.621	35199	22769	25562	35204	33934	None
235	33471	1.898	2.812	32434	22787	25563	25546	33934	None
245	33474	N/A	3.371	32434	31658	25561	25546	33934	None
311	22471	N/A	1.992	35199	35205	35202	25546	33936	None
312	22471	N/A	1.992	35199	35205	35202	25546	33936	None
315	33472	N/A	2.312	35199	35205	25562	25546	33936	None
317	33472	N/A	2.312	35199	35205	25562	25546	33936	None
318	33472	N/A	3.120	35199	22771	25561	25546	33936	None
320	33472	N/A	2.312	35199	35205	25562	25546	33936	None
320	33472	N/A	2.312	35199	35205	25562	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CATERPILLAR	322		7.480	8.150	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	325	EXC	8.000	9.055	1.654	25547	22779	22751	Not Req'd
CATERPILLAR	330	EXC	8.500	9.665	1.811	25551	22751	22749	Not Req'd
CATERPILLAR	345	EXC	9.000	11.438	2.003	25551	22751	Not Req'd	Not Req'd
CATERPILLAR	375	EXC	10.250	12.244	2.253	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	375	EXC	10.25	12.244	2.253	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	561	PIPELAYER	6.906	8.120	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	561		8.000	9.000	1.750	25548	22777	22751	Not Req'd
CATERPILLAR	571		7.985	9.880	1.752	25548	22777	22751	Not Req'd
CATERPILLAR	572		8.500	9.813	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	572		8.5	9.88	1.878	25551	22751	22749	Not Req'd
CATERPILLAR	578	PIPELAYER	8.500	9.880	1.878	25551	22751	22749	Not Req'd
CATERPILLAR	578	PPR	8.500	9.650	1.878	25551	22751	22749	Not Req'd
CATERPILLAR	583		7.985	11.44	1.752	25548	22777	22751	Not Req'd
CATERPILLAR	583		8.000	11.438	1.740	25548	22777	22751	Not Req'd
CATERPILLAR	583		9.000	11.313	1.998	25551	22749	Not Req'd	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
322	33472	N/A	2.312	35199	35205	25562	25546	33936	None
325	32437	N/A	2.519	35199	22769	25562	25546	33934	None
330	32441	N/A	2.677	35199	22769	25562	35204	33934	None
345	32441	N/A	2.996	32434	22787	25563	35204	33934	None
375	33474	N/A	3.710	32434	Not Req'd	25561	25546	33934	None
375	33474	N/A	3.71	32434	Not Req'd	25561	25546	33934	None
561	33472	N/A	2.312	35199	35205	25562	25546	33936	None
561	33471	1.774	2.621	32434	22769	25562	25546	33934	None
571	32441	N/A	2.621	35199	22769	25562	35204	33934	None
572	33471	1.898	2.812	32434	22787	25563	25546	33934	None
572	32441	N/A	2.621	32434	22769	25562	35204	33934	None
578	32441	N/A	2.940	32434	22787	25563	35204	33934	None
578	32441	N/A	2.937	32434	22787	25563	35204	33934	None
583	32441	N/A	2.621	35199	22769	25562	35204	33934	None
583	33471	1.788	2.618	32434	22787	25561	25546	33934	None
583	32441	2.024	2.996	32434	22771	25561	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CATERPILLAR	589		9.000	11.440	2.003	25551	22751	Not Req'd	Not Req'd
CATERPILLAR	589	PPR	9.000	10.770	2.003	25551	22751	Not Req'd	Not Req'd
CATERPILLAR	594		10.250	12.125	2.252	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	931		6.125	5.989	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	931	SALT	6.125	6.16	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	931	Sealed	6.125	6.16	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	933		6.125	5.989	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	933		6.750	7.000	1.314	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	935		6.125	5.989	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	939		6.735	7.535	1.318	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	941		6.735	7.220	1.315	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	941	(9/16" Bolt)	6.735	7	1.314	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	941	(5/8" Bolt)	6.735	7.22	1.315	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	941		6.750	7.000	1.314	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	943		6.750	7.000	1.314	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	951		6.906	8.120	1.442	25500	Not Req'd	22779	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
589	32441	N/A	3.220	32434	31658	25561	25546	33934	None
589	32441	N/A	3.220	32434	31658	25561	25546	33934	None
594	33474	2.274	3.375	32434	31658	25561	25546	33934	None
931	32435	1.150	1.850	35199	33471	N/A	N/A	33934	None
931	32435	N/A	1.85	35199	33471	35202	EITHER	33934	None
931	32435	N/A	1.85	35199	33471	35202	EITHER	33934	None
933	32435	1.150	1.850	35199	33471	N/A	EITHER	33934	None
933	33472	1.330	1.993	35199	35205	N/A	25546	33936	None
935	32435	1.150	1.850	35199	33471	N/A	EITHER	33934	None
939	22471	N/A	2.228	35199	35205	25562	25546	33936	None
941	22471	N/A	2.118	35199	35205	25562	25546	33936	None
941	22471	N/A	1.993	35199	35205	35202	25546	33936	None
941	22471	N/A	2.118	35199	35205	25562	25546	33936	None
941	33472	1.330	1.993	35199	35205	N/A	25546	33936	None
943	33472	1.330	1.993	35199	35205	N/A	25546	33936	None
951	33472	N/A	2.312	35199	35205		25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CATERPILLAR	953		6.750	8.125	1.438	25500	22779	22779	Not Req'd
CATERPILLAR	955		6.750	7.000	1.314	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	955	NEW	6.750	8.125	1.438	25500	22779	22779	Not Req'd
CATERPILLAR	955		8.000	9.000	1.750	25548	22777	22751	Not Req'd
CATERPILLAR	963		8.000	9.000	1.750	25548	22777	22751	Not Req'd
CATERPILLAR	973		8.500	9.813	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	973		8.5	9.88	1.878	25551	22751	22749	Not Req'd
CATERPILLAR	977	OLD	6.750	8.125	1.438	25500	22779	22779	Not Req'd
CATERPILLAR	977	NEW	8.000	9.688	1.747	25548	22777	22751	Not Req'd
CATERPILLAR	977		8.500	9.813	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	983		9.000	11.313	1.998	25551	22749	Not Req'd	Not Req'd
CATERPILLAR	5080		10.250	12.244	2.253	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	5130					200281	Not Req'd	Not Req'd	25506
CATERPILLAR	D7	OLD	8.000	9.688	1.747	25548	22777	22751	Not Req'd
CATERPILLAR	14A		7.985	11.440	1.752	25548	22777	22751	Not Req'd
CATERPILLAR	17A		7.985	9.88	1.752	25548	22777	22751	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
953	33472	1.458	2.118	35199	35205	N/A	25546	33936	None
955	33472	1.330	1.993	35199	35205	N/A	25546	33936	None
955	33472	1.458	2.118	35199	35205	N/A	25546	33936	None
955	33471	1.774	2.621	32434	22769	25562	25546	33934	None
963	33471	1.774	2.621	32434	22769	25562	25546	33934	None
973	33471	1.898	2.812	32434	22787	25563	25546	33934	None
973	32441	N/A	2.812	32434	22787	25563	35204	33934	None
977	33472	1.458	2.118	35199	35205	N/A	25546	33936	None
977	33471	1.773	2.621	32434	22769	25563	25546	33934	None
977	33471	1.898	2.812	32434	22787	25563	25546	33934	None
983	32441	2.024	2.996	32434	22771	25561	25546	33934	None
5080	33474	N/A	3.710	32434	Not Req'd	25561	25546	33934	None
5130	32435	N/A	4.330	32434	Not Req'd	25561	25546	33934	None
D7	33471	1.773	2.621	32434	22769	25563	25546	33934	None
14A	32441	N/A	2.621	35199	22769	25562	35204	33934	None
17A	32441	N/A	2.621	35199	22769	25562	35204	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CATERPILLAR	215A		7.480	8.120	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	225B	EXC	7.48	8.12	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	231D		7.985	9.06	1.752	25548	22777	22751	Not Req'd
CATERPILLAR	235D	EXC	9	11.44	2.003	25551	22751	Not Req'd	Not Req'd
CATERPILLAR	245S		9.000	11.313	1.998	25551	22749	Not Req'd	Not Req'd
CATERPILLAR	307C		6.060	5.150	0.940	200281	Not Req'd	Not Req'd	25505
CATERPILLAR	315B		7.480	8.150	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	315C		7.480	8.150	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	318C		7.48	8.15	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	320C		7.480	8.150	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	322B		7.480	8.150	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	322C		7.480	8.150	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	330B		8.500	9.665	1.811	25551	22751	22749	Not Req'd
CATERPILLAR	345B		8.500	9.882	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	345BL		8.500	9.882	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	385B		10.250	13.188	2.253	25501	Not Req'd	Not Req'd	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
215A	33472	N/A	2.312	35199	35205	25562	25546	33936	None
225B	33472	N/A	2.312	35199	35205	25562	25546	33936	None
231D	32441	N/A	2.621	35199	22769	25562	35204	33934	None
235D	32441	N/A	2.996	32434	22787	25563	35204	33934	None
245S	32441	2.024	2.996	32434	22771	25561	25546	33934	None
307C	32435	N/A	1.620	35199	33471	35205	35204	33934	None
315B	33472	N/A	3.120	35199	22771	25561	25546	33936	None
315C	33472	N/A	3.120	35199	22771	25561	25546	33936	None
318C	33472	N/A	3.12	35199	22771	25561	25546	33936	None
320C	33472	N/A	3.120	35199	22771	25561	25546	33936	None
322B	33472	N/A	3.120	35199	22771	25561	25546	33936	None
322C	33472	N/A	3.120	35199	22771	25561	25546	33936	None
330B	32441	N/A	2.677	35199	22769	25562	35204	33934	None
345B	32441	N/A	2.812	32434	22787	25563	35204	33934	None
345BL	32441	N/A	2.812	32434	22787	25563	35204	33934	None
385B	33474	N/A	3.371	32434	31658	25561	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CATERPILLAR	385B		10.25	13.188	2.253	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	5080		10.25	12.244	2.253	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	561H		6.735	7.535	1.318	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	561H-HD		6.735	8.445	1.418	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	571A		8.500	9.813	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	572PL		8.000	9.688	1.747	25548	22777	22751	Not Req'd
CATERPILLAR	583R	PIPELAYER	8.500	9.880	1.878	25551	22751	22749	Not Req'd
CATERPILLAR	594		10.25	12.25	2.252	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	671PL		6.750	8.125	1.438	25500	22779	22779	Not Req'd
CATERPILLAR	935B	Sealed	6.125	6.16	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	935C		6.125	6.160	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	935C	SALT	6.125	6.16	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	951B		6.750	8.125	1.438	25500	22779	22779	Not Req'd
CATERPILLAR	951C		6.906	8.120	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	955		7.985	9.06	1.752	25548	22777	22751	Not Req'd
CATERPILLAR	955C		6.750	7.000	1.314	25499	Not Req'd	Not Req'd	25502

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
385B	33474	N/A	3.371	32434	31658	25561	25546	33934	None
5080	33474	N/A	3.371	32434	31658	25561	25546	33934	None
561H	22471	N/A	2.336	35199	22769	25562	25546	33936	None
561H-HD	33472	N/A	2.336	35199	22769	25562	25546	33936	None
571A	33471	1.898	2.812	32434	22787	25563	25546	33934	None
572PL	33471	1.773	2.621	32434	22769	25563	25546	33934	None
583R	32441	N/A	2.940	32434	22787	25563	35204	33934	None
594	33474	N/A	3.371	32434	31658	25561	25546	33934	None
671PL	33472	1.458	2.118	35199	35205	N/A	25546	33936	None
935B	32435	N/A	1.85	35199	33471	35202	EITHER	33934	None
935C	32435	N/A	1.850	35199	33471	35202	EITHER	33934	None
935C	32435	N/A	1.85	35199	33471	35205	EITHER	33934	None
951B	33472	1.458	2.118	35199	35205	N/A	25546	33936	None
951C	33472	N/A	2.312	35199	35205	25562	25546	33936	None
955	32441	N/A	2.621	35199	22769	25562	35204	33934	None
955C	33472	1.330	1.993	35199	35205	N/A	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CATERPILLAR	955D		6.750	8.125	1.438	25500	22779	22779	Not Req'd
CATERPILLAR	955E		6.750	8.125	1.438	25500	22779	22779	Not Req'd
CATERPILLAR	955H		6.750	8.125	1.438	25500	22779	22779	Not Req'd
CATERPILLAR	955-HD		6.906	8.13	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	955K		6.750	8.125	1.438	25500	22779	22779	Not Req'd
CATERPILLAR	955LD		6.750	7.000	1.314	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	977E		8.000	9.688	1.747	25548	22777	22751	Not Req'd
CATERPILLAR	977H		8.000	9.688	1.747	25548	22777	22751	Not Req'd
CATERPILLAR	977K		8.000	9.688	1.747	25548	22777	22751	Not Req'd
CATERPILLAR	AP1050		6.125	6.160	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	D10		10.25	12.25	2.252	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	D10	PPR	10.25	11.97	2.252	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	D10N		10.25	12.25	2.252	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	D10N	PPR	10.25	11.97	2.252	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	D10N		10.25	11.97	2.253	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	D11		12.5	13.81	2.626	25553	Not Req'd	Not Req'd	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
955D	33472	1.458	2.118	35199	35205	N/A	25546	33936	None
955E	33472	1.458	2.118	35199	35205	N/A	25546	33936	None
955H	33472	1.458	2.118	35199	35205	N/A	25546	33936	None
955-HD	33472	N/A	2.118	35199	35205	25562	25546	33936	None
955K	33472	1.458	2.118	35199	35205	N/A	25546	33936	None
955LD	33472	1.330	1.993	35199	35205	N/A	25546	33936	None
977E	33471	1.773	2.621	32434	22769	25563	25546	33934	None
977H	33471	1.773	2.621	32434	22769	25563	25546	33934	None
977K	33471	1.773	2.621	32434	22769	25563	25546	33934	None
AP1050	32435	N/A	1.850	35199	33471	35205	EITHER	33934	None
D10	33474	N/A	3.809	32434	Not Req'd	25561	25546	33934	None
D10	33474	N/A	3.809	32434	Not Req'd	25561	25546	33934	None
D10N	33474	N/A	3.557	32434	31658	25561	25546	33934	None
D10N	33474	N/A	3.557	32434	31658	25561	25546	33934	None
D10N	33474	N/A	3.557	32434	31658	25561	25546	33934	None
D11	Not Req'd	N/A	4.633	32434	Not Req'd	25561	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CATERPILLAR	D11N	PPR	12.25	11.97	2.252	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	D11N		12.5	11.97	2.252	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	D11R		12.5	11.97	2.252	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	D2		6.125	6.156	1.127	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	D3		6.125	5.989	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	D3B		6.125	6.16	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	D3C		6.125	6.16	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	D4		6.750	7.000	1.314	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	D4B		6.125	5.989	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	D4C		6.125	5.989	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	D4C		6.735	7	1.314	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	D4C		6.125	6.16	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	D4D		6.735	7.000	1.314	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	D4G		6.125	5.989	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	D4H		6.735	7.535	1.318	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	D4H-HD		6.735	8.445	1.418	25500	Not Req'd	22779	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
D11N	33474	N/A	3.557	32434	31658	25561	25546	33934	None
D11N	33474	N/A	3.557	32434	31658	25561	25546	33934	None
D11R	33474	N/A	3.557	32434	31658	25561	25546	33934	None
D2	32435	N/A	1.690	35199	33471	35205	35204	33934	None
D3	32435	1.150	1.850	35199	33471	N/A	EITHER	33934	None
D3B	32435	N/A	1.85	35199	33471	35205	EITHER	33934	None
D3C	32435	N/A	1.85	35199	33471	35202	EITHER	33934	None
D4	33472	1.330	1.993	35199	35205	N/A	25546	33936	None
D4B	32435	1.150	1.850	35199	33471	N/A	EITHER	33934	None
D4C	32435	1.150	1.850	35199	33471	N/A	EITHER	33934	None
D4C	22471	N/A	1.994	35199	35205	35202	25546	33936	None
D4C	32435	N/A	1.85	35199	33471	35202	EITHER	33934	None
D4D	22471	N/A	1.993	35199	35205	35202	25546	33936	None
D4G	32435	1.150	1.850	35199	33471	N/A	EITHER	33934	None
D4H	22471	N/A	2.228	35199	35205	25562	25546	33936	None
D4H-HD	33472	N/A	2.336	35199	22769	25562	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CATERPILLAR	D5		6.750	8.125	1.438	25500	22779	22779	Not Req'd
CATERPILLAR	D5	PRO	6.906	8.120	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	D5	Sealed	6.906	8.12	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	D5B		6.906	8.125	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	D5C		6.735	7.535	1.318	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	D5H		7.480	8.120	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	D5H-HD		7.480	9.390	1.490	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	D5M		6.735	7.535	1.318	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	D6		6.750	8.125	1.438	25500	22779	22779	Not Req'd
CATERPILLAR	D6		7.985	9.060	1.752	25548	22777	22751	Not Req'd
CATERPILLAR	D6B		6.750	8.125	1.438	25500	22779	22779	Not Req'd
CATERPILLAR	D6C		8.000	9.000	1.750	25548	22777	22751	Not Req'd
CATERPILLAR	D6D		7.985	9.060	1.752	25548	22777	22751	Not Req'd
CATERPILLAR	D6H		7.985	9.060	1.530	25547	22779	22777	Not Req'd
CATERPILLAR	D6H-HD		7.985	10.315	1.753	25548	22777	22751	Not Req'd
CATERPILLAR	D6M		7.480	1.495	8.120	25553	Not Req'd	Not Req'd	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
D5	33472	1.458	2.118	35199	35205	N/A	25546	33936	None
D5	33472	N/A	2.312	35199	35205	25562	25546	33936	None
D5	33472	N/A	2.312	35199	35205	25562	25546	33936	None
D5B	33472	N/A	2.312	35199	35205	25562	25546	33936	None
D5C	22471	N/A	2.280	35199	35205	25562	25546	33936	None
D5H	33472	N/A	2.413	35199	22769	25562	25546	33936	None
D5H-HD	32437	N/A	2.495	35199	22769	25562	25546	33934	None
D5M	22471	N/A	2.366	35199	22769	25562	25546	33936	None
D6	33472	1.458	2.118	35199	35205	N/A	25546	33936	None
D6	32441	N/A	2.621	35199	22769	25562	35204	33934	None
D6B	33472	1.458	2.118	35199	35205	N/A	25546	33936	None
D6C	33471	1.774	2.621	32434	22769	25562	25546	33934	None
D6D	32441	N/A	2.621	35199	22769	25562	35204	33934	None
D6H	32437	N/A	2.750	35199	35206	25563	35204	33934	None
D6H-HD	32441	N/A	2.864	35199	22787	25563	35204	33934	None
D6M	Not Req'd	N/A	2.495	35199	22769	25562	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CATERPILLAR	D6R		7.985	9.060	1.752	25548	22777	22751	Not Req'd
CATERPILLAR	D7C		7.985	9.880	1.752	25548	22777	22751	Not Req'd
CATERPILLAR	D7D		7.985	9.880	1.752	25548	22777	22751	Not Req'd
CATERPILLAR	D7E		7.985	9.880	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	D7E		8.500	9.813	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	D7F		7.985	9.880	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	D7F		8.500	9.813	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	D7G		7.985	9.880	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	D7G		8.500	9.813	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	D7G	Sealed	7.985	9.88	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	D7G-LGP		8.5	9.88	1.878	25551	22751	22749	Not Req'd
CATERPILLAR	D7H		8.500	9.880	1.878	25551	22751	22749	Not Req'd
CATERPILLAR	D7H-HD		8.500	10.866	1.878	25551	22751	22749	Not Req'd
CATERPILLAR	D7N		8.500	9.813	1.877	25551	22751	22749	Not Req'd
CATERPILLAR	D7R		8.500	10.875	1.878	25551	22751	22749	Not Req'd
CATERPILLAR	D8		8.000	11.438	1.740	25548	22777	22751	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
D6R	32441	N/A	2.864	35199	22787	25563	35204	33934	None
D7C	32441	N/A	2.621	35199	22769	25562	35204	33934	None
D7D	32441	N/A	2.621	35199	22769	25562	35204	33934	None
D7E	32441	N/A	2.812	32434	22787	25563	35204	33934	None
D7E	33471	1.898	2.812	32434	22787	25563	25546	33934	None
D7F	32441	N/A	2.812	32434	22787	25563	35204	33934	None
D7F	33471	1.898	2.812	32434	22787	25563	25546	33934	None
D7G	32441	N/A	2.812	32434	22787		35204	33934	None
D7G	33471	1.898	2.812	32434	22787	25563	25546	33934	None
D7G	32441	N/A	2.812	32434	22787	25563	35204	33934	None
D7G-LGP	32441	N/A	2.812	32434	22787	25563	35204	33934	None
D7H	32441	N/A	2.937	32434	22787	25563	35204	33934	None
D7H-HD	32441	N/A	3.085	32434	22771	25561	25546	33934	None
D7N	33471	1.898	2.812	32434	22787	25563	25546	33934	None
D7R	32441	N/A	3.085	32434	22771	25561	25546	33934	None
D8	33471	1.788	2.618	32434	22787	25561	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CATERPILLAR	D8D		8.000	11.438	1.740	25548	22777	22751	Not Req'd
CATERPILLAR	D8E		8.000	11.438	1.740	25548	22777	22751	Not Req'd
CATERPILLAR	D8F		8.000	11.438	1.740	25548	22777	22751	Not Req'd
CATERPILLAR	D8G		8.000	11.438	1.740	25548	22777	22751	Not Req'd
CATERPILLAR	D8H		9.000	11.313	1.998	25551	22749	Not Req'd	Not Req'd
CATERPILLAR	D8H	Sealed	9	11.44	2.003	25551	22751	Not Req'd	Not Req'd
CATERPILLAR	D8J		9.000	11.313	1.998	25551	22749	Not Req'd	Not Req'd
CATERPILLAR	D8K		9.000	11.313	1.998	25551	22749	Not Req'd	Not Req'd
CATERPILLAR	D8L		8.500	9.880	1.878	25551	22751	22749	Not Req'd
CATERPILLAR	D8N		8.500	9.880	1.878	25551	22751	22749	Not Req'd
CATERPILLAR	D8R		8.5	9.88	1.878	25551	22751	22749	Not Req'd
CATERPILLAR	D9		9.000	11.875	2.002	25551	22749	Not Req'd	Not Req'd
CATERPILLAR	D9		10.25	12.25	2.25	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	D9D		10.250	12.125	2.252	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	D9E		10.250	12.125	2.252	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	D9G		10.250	12.125	2.252	25501	Not Req'd	Not Req'd	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
D8D	33471	1.788	2.618	32434	22787	25561	25546	33934	None
D8E	33471	1.788	2.618	32434	22787	25561	25546	33934	None
D8F	33471	1.788	2.618	32434	22787	25561	25546	33934	None
D8G	33471	1.788	2.618	32434	22787	25561	25546	33934	None
D8H	32441	2.024	2.996	32434	22771	25561	25546	33934	None
D8H	32441	N/A	2.996	32434		25563	35204	33934	None
D8J	32441	2.024	2.996	32434	22771	25561	25546	33934	None
D8K	32441	2.024	2.996	32434	22771	25561	25546	33934	None
D8L	32441	N/A	2.940	32434	22787	25563	35204	33934	None
D8N	32441	N/A	2.940	32434	22787	25563	35204	33934	None
D8R	32441	N/A	2.94	32434	22787	25563	35204	33934	None
D9	32441	2.024	2.871	32434	22789	25561	25546	33934	None
D9	33474	N/A	3.371	32434	31658	25561	25546	33934	None
D9D	33474	2.274	3.375	32434	31658	25561	25546	33934	None
D9E	33474	2.274	3.375	32434	31658	25561	25546	33934	None
D9G	33474	2.274	3.375	32434	31658	25561	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CATERPILLAR	D9H	Sealed	10.25	12.25	2.252	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	D9H	SALT	10.25	12.25	2.252	25501	Not Req'd	Not Req'd	Not Req'd
CATERPILLAR	D9L		9.000	11.875	2.002	25551	22749	Not Req'd	Not Req'd
CATERPILLAR	D9L	PPR	9	10.77	2.003	25551	22751	Not Req'd	Not Req'd
CATERPILLAR	D9N		9.45	10.98	2.003	25551	22751	Not Req'd	Not Req'd
CATERPILLAR	D9N	PPR	9.45	10.44	2.003	25551	22751	Not Req'd	Not Req'd
CATERPILLAR	D9R		9.45	10.98	2.003	25551	22751	Not Req'd	Not Req'd
CATERPILLAR	D9R	PPR	9.45	10.44	2.003	25551	22751	Not Req'd	Not Req'd
CATERPILLAR	E110B		6.75	7.01	1.319	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	E120B		6.75	7.01	1.319	25499	Not Req'd	Not Req'd	25502
CATERPILLAR	E180		6.906	8.12	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	E200B		7.48	8.125	1.443	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	E240		7.48	8.125	1.443	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	E300A		7.48	8.58	1.488	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	E300B		8	9.65	1.75	25548	22777	22751	Not Req'd
CATERPILLAR	E450		8.5	10	1.873	25551	22751	22749	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

			BUSHING REMOVAL		BUSHING INSTALL				
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
D9H	33474	N/A	3.371	32434	31658	25561	25546	33934	None
D9H	33474	N/A	3.22	32434	31658	25561	25546	33934	None
D9L	32441	2.024	2.871	32434	22789	25561	25546	33934	None
D9L	32441	N/A	3.23	32434	31658	25561	25546	33934	None
D9N	32441	N/A	3.163	32434	22771	25561	25546	33934	None
D9N	32441	N/A	3.136	32434	22771	25561	25546	33934	None
D9R	32441	N/A	3.163	32434	22771	25561	25546	33934	None
D9R	32441	N/A	3.136	32434	22771	25561	25546	33934	None
E110B	22471	N/A	1.984	35199	35205	35205	EITHER	33936	None
E120B	22471	N/A	1.984	35199	35205	35202	EITHER	33936	None
E180	33472	N/A	2.31	35199	35205	25562	25546	33936	None
E200B	33472	N/A	2.311	35199	35205	25562	25546	33936	None
E240	33472	N/A	2.311	35199	35205	25562	25546	33936	None
E300A	32437	N/A	2.325	35199	22769	25562	25546	33936	None
E300B	32441	N/A	2.624	35199	22769	25562	35204	33934	None
E450	32441	N/A	2.809	35199	22787	25563	35204	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
CATERPILLAR	E70		5.315	5.51	0.945	200281	Not Req'd	Not Req'd	25505
CATERPILLAR	E70B		5.315	5.51	0.945	200281	Not Req'd	Not Req'd	25505
CATERPILLAR	EL180		6.906	8.12	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	EL200B		7.48	8.125	1.443	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	EL240		7.48	8.125	1.443	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	EL300A/B		8	9.65	1.75	25548	22777	22751	Not Req'd
CATERPILLAR	FB227		7.985	9.06	1.752	25548	22777	22751	Not Req'd
CATERPILLAR	MHI 180-8		6.906	8.12	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	MHI 180LC-8		6.906	8.12	1.442	25500	Not Req'd	22779	Not Req'd
CATERPILLAR	MHI 300LC-8		8	9.65	1.75	25548	22777	22751	Not Req'd
CATERPILLAR	PR450		6.125	6.16	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	SF350		6.125	6.16	1.129	200281	Not Req'd	Not Req'd	25504
CATERPILLAR	TR225		6.125	6.16	1.129	200281	Not Req'd	Not Req'd	25504
DRESSER	150		6.5	6.69	1.374	25499	Not Req'd	Not Req'd	25502
DRESSER	175		7	7.87	1.625	25547	22779	22751	Not Req'd
DRESSER	500		6	5.36	1.125	200281	Not Req'd	Not Req'd	25504

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
E70	32435	N/A	1.614	35199	33471	35202	35204	33934	None
E70B	32435	N/A	1.614	3.5199	33471	35202	35204	33934	None
EL180	33472	N/A	2.31	35199	35205	25562	25546	33936	None
EL200B	33472	N/A	2.311	35199	35205	25562	25546	33936	None
EL240	33472	N/A	2.311	35199	35205	25562	25546	33936	None
EL300A/B	32441	N/A	2.624	35199	22769	25562	35204	33934	None
FB227	32441	N/A	2.621	35199	22769	25562	35204	33934	None
MHI 180-8	33472	N/A	2.31	35199	35205	25562	25546	33936	None
MHI 180LC-8	33472	N/A	2.31	35199	35205	25562	25546	33936	None
MHI 300LC-8	32441	N/A	2.624	35199	22769	25562	35204	33934	None
PR450	32435	N/A	1.85	35199	33471	35202	EITHER	33934	None
SF350	32435	N/A	1.85	35199	33471	35202	EITHER	33934	None
TR225	32435	N/A	1.85	35199	33471	35202	EITHER	33934	None
150	33472	N/A	2.053	35199	35205	25562	25546	33934	None
175	32437	N/A	2.364	35199	22769	25562	25546	33936	None
500	32435	N/A	1.656	35199	33471	35202	35204	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
DRESSER	100B		6	5.97	1.25	25498	Not Req'd	Not Req'd	25502
DRESSER	100C		6	6.5	1.25	25498	Not Req'd	Not Req'd	25502
DRESSER	100E		6	6.5	1.25	25498	Not Req'd	Not Req'd	25502
DRESSER	100G		6.49	6.69	1.314	25499	Not Req'd	Not Req'd	25502
DRESSER	125C		6.5	6.69	1.374	25499	Not Req'd	Not Req'd	25502
DRESSER	125E		6.5	6.69	1.374	25499	Not Req'd	Not Req'd	25502
DRESSER	125G		6.49	6.69	1.314	25499	Not Req'd	Not Req'd	25502
DRESSER	175B		7	7.87	1.625	25547	22779	22751	Not Req'd
DRESSER	175B		7.5	8.81	1.75	25548	22777	22751	Not Req'd
DRESSER	175C		7.5	8.81	1.75	25548	22777	22751	Not Req'd
DRESSER	250B		7.5	9.31	1.75	25548	22777	22751	Not Req'd
DRESSER	250C		7.5	9.31	1.75	25548	22777	22751	Not Req'd
DRESSER	500E		5.99	5.3	1.125	200281	Not Req'd	Not Req'd	25504
DRESSER	T340		6	4.75	1.01	200281	Not Req'd	Not Req'd	25505
DRESSER	T5		6	4.75	1.01	200281	Not Req'd	Not Req'd	25505
DRESSER	T6		6	5.97	1.25	25498	Not Req'd	Not Req'd	25502

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
100B	32435	N/A	1.8	35199	33471	35202	EITHER	33934	None
100C	32435	N/A	1.805	35199	33471	35202	EITHER	33934	None
100E	32435	N/A	1.8	35199	33471	35205	EITHER	33934	None
100G	22471	N/A	2.115	35199	35205	25562	25546	33934	None
125C	33472	N/A	2.053	35199	35205	25562	25546	33934	None
125E	33472	N/A	2.053	35199	35205	25562	25546	33934	None
125G	22471	N/A	2.115	35199	35205	25562	25546	33934	None
175B	32437	N/A	2.364	35199	22769	25562	25546	33936	None
175B	32441	N/A	2.614	35199	22769	25562	25546	33936	None
175C	32441	N/A	2.614	35199	22769	25562	25546	33936	None
250B	32441	N/A	2.614	35199	22769	25562	25546	33934	None
250C	32441	N/A	2.614	35199	22769	25562	25546	33934	None
500E	32435	N/A	1.675	35199	33471	35202	35204	33934	None
T340	32435	N/A	1.47	35199	32437	35202	35204	33934	None
T5	32435	N/A	1.47	35199	32437	35202	35204	33934	None
T6	32435	N/A	1.8	35199	33471	35202	EITHER	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
DRESSER	T7		6	6.5	1.25	25498	Not Req'd	Not Req'd	25502
DRESSER	TD12	SALT	7.5	8.03	1.5	25500	Not Req'd	22777	Not Req'd
DRESSER	TD12	Sealed	7.5	8.03	1.75	25548	22777	22751	Not Req'd
DRESSER	TD12A		7.49	8.03	1.5	25500	Not Req'd	22777	Not Req'd
DRESSER	TD12B		7.49	8.03	1.5	25500	Not Req'd	22777	Not Req'd
DRESSER	TD15B		7	7.87	1.625	25547	22779	22751	Not Req'd
DRESSER	TD15B		7.5	8.81	1.75	25548	22777	22751	Not Req'd
DRESSER	TD15C		7.5	8.81	1.75	25548	22777	22751	Not Req'd
DRESSER	TD15C		7.5	8.81	1.625	25547	22779	22751	Not Req'd
DRESSER	TD15C	LGP	7.5	8.81	1.625	25547	22779	22751	Not Req'd
DRESSER	TD15E	LGP	7.98	8.81	1.75	25548	22777	22751	Not Req'd
DRESSER	TD15E	SALT	7.98	8.81	1.75	25548	22777	22751	Not Req'd
DRESSER	TD15E	Sealed	7.98	8.81	1.75	25548	22777	22751	Not Req'd
DRESSER	TD20B		7.5	9.31	1.75	25548	22777	22751	Not Req'd
DRESSER	TD20C		7.5	9.31	1.75	25548	22777	22751	Not Req'd
DRESSER	TD20C		8.5	9.31	1.875	25551	22751	22749	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

			BUSHING REMOVAL		BUSHING INSTALL				
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
T7	32435	N/A	1.805	35199	33471	35202	EITHER	33934	None
TD12	32437	N/A	2.366	35199	22769	25562	25546	33936	None
TD12	32441	N/A	2.366	35199	22769	25562	25546	33936	None
TD12A	32437	N/A	2.366	35199	22769	25562	25546	33936	None
TD12B	32437	N/A	2.366	35199	22769	25562	25546	33936	None
TD15B	32437	N/A	2.364	35199	22769	25562	25546	33936	None
TD15B	32441	N/A	2.614	35199	22769	25562	25546	33936	None
TD15C	32441	N/A	2.614	35199	22769	25562	25546	33936	None
TD15C	32437	N/A	2.614	35199	22769	25562	25546	33936	None
TD15C	32437	N/A	2.614	35199	22769	25562	25546	33936	None
TD15E	32441	N/A	2.754	35199	35206	25563	35204	33936	None
TD15E	32441	N/A	2.754	35199	35206	25563	35204	33936	None
TD15E	32441	N/A	2.756	35199	35206	25563	35204	33936	None
TD20B	32441	N/A	2.614	35199	22769	25562	25546	33934	None
TD20C	32441	N/A	2.614	35199	22769	25562	25546	33934	None
TD20C	32441	N/A	2.862	35199	22787	25563	35204	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
DRESSER	TD20E		8.5	10.44	1.875	25551	22751	22749	Not Req'd
DRESSER	TD20E		8.5	10.43	1.875	25551	22751	22749	Not Req'd
DRESSER	TD20E	SPLIT	8.5	10.43	1.875	25551	22751	22749	Not Req'd
DRESSER	TD20G		8.5	10.43	1.875	25551	22751	22749	Not Req'd
DRESSER	TD20G	LGP	8.5	10.43	1.875	25551	22751	22749	Not Req'd
DRESSER	TD24		8.5	11	1.875	25551	22751	22749	Not Req'd
DRESSER	TD25B		8.5	11	1.875	25551	22751	22749	Not Req'd
DRESSER	TD25C		9.87	11	2.125	25501	Not Req'd	Not Req'd	Not Req'd
DRESSER	TD25E		9.87	11	2.125	25501	Not Req'd	Not Req'd	Not Req'd
DRESSER	TD25G		9.87	11	2.125	25501	Not Req'd	Not Req'd	Not Req'd
DRESSER	TD30		9.87	11	2.125	25501	Not Req'd	Not Req'd	Not Req'd
DRESSER	TD4		6	4.75	1.01	200281	Not Req'd	Not Req'd	25505
DRESSER	TD40	SPLIT	11.02	12.6	2.454	25553	Not Req'd	Not Req'd	Not Req'd
DRESSER	TD5		6	4.75	1.01	200281	Not Req'd	Not Req'd	25505
DRESSER	TD6		6	5.97	1.25	25498	Not Req'd	Not Req'd	25502
DRESSER	TD7C		6	6.5	1.25	25498	Not Req'd	Not Req'd	25502

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
TD20E	32441	N/A	2.866	35199	22787	25563	35204	33934	None
TD20E	32441	N/A	2.866	35199	22787	25563	35204	33934	None
TD20E	32441	N/A	2.866	35199	22787	25563	35204	33934	None
TD20G	32441	N/A	2.866	35199	22787	25563	35204	33934	None
TD20G	32441	N/A	2.866	35199	22787	25563	35204	33934	None
TD24	32441	N/A	2.864	35199	22787	25563	35204	33934	None
TD25B	32441	N/A	2.864	35199	22787	25563	35204	33934	None
TD25C	33474	N/A	3.239	32434	31658	25561	25546	33934	None
TD25E	33474	N/A	3.239	32434	31658	25561	25546	33934	None
TD25G	33474	N/A	3.239	32434	31658	25561	25546	33934	None
TD30	33474	N/A	3.239	32434	31658	25561	25546	33934	None
TD4	32435	N/A	1.47	35199	32437	35202	35204	33934	None
TD40	Not Req'd	N/A	3.772	32434	Not Req'd	25561	25546	33934	None
TD5	32435	N/A	1.47	35199	32437	35202	35204	33934	None
TD6	32435	N/A	1.8	35199	33471	35202	EITHER	33934	None
TD7C	32435	N/A	1.805	35199	33471	35202	EITHER	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
DRESSER	TD7E		6	6.5	1.25	25498	Not Req'd	Not Req'd	25502
DRESSER	TD7G		6.49	6.69	1.314	25499	Not Req'd	Not Req'd	25502
DRESSER	TD7H		6.49	6.69	1.312	25499	Not Req'd	Not Req'd	25502
DRESSER	TD8C		6.5	6.69	1.374	25499	Not Req'd	Not Req'd	25502
DRESSER	TD8E		6.5	6.69	1.374	25499	Not Req'd	Not Req'd	25502
DRESSER	TD8G		6.49	6.69	1.314	25499	Not Req'd	Not Req'd	25502
DRESSER	TD9B		6.5	6.69	1.374	25499	Not Req'd	Not Req'd	25502
FIAT	8		6.688	7.000	1.373	25499	Not Req'd	Not Req'd	25502
FIAT	10		6.938	7.875	1.451	25500	22779	22779	Not Req'd
FIAT	14		7.500	8.625	1.569	25547	22779	22777	Not Req'd
FIAT	31		11.281	12.953	2.374	25553	Not Req'd	Not Req'd	Not Req'd
FIAT	455		5.313	4.875	0.978	200281	Not Req'd	Not Req'd	25505
FIAT	505		5.313	4.875	0.978	200281	Not Req'd	Not Req'd	25505
FIAT	555		5.313	4.875	0.978	200281	Not Req'd	Not Req'd	25505
FIAT	650		6.000	6.500	1.246	25498	Not Req'd	Not Req'd	25504
FIAT	652		6	6.24	1.25	25498	Not Req'd	Not Req'd	25502

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
TD7E	32435	N/A	1.8	35199	33471	35202	EITHER	33934	None
TD7G	22471	N/A	2.115	35199	35205	25562	25546	33934	None
TD7H	22471	N/A	2.115	35199	35205	25562	25546	33934	None
TD8C	33472	N/A	2.053	35199	35205	25562	25546	33934	None
TD8E	33472	N/A	2.053	35199	35205	25562	25546	33934	None
TD8G	22471	N/A	2.115	35199	35205	25562	25546	33934	None
TD9B	33472	N/A	2.053	35199	35205	25562	25546	33934	None
8	33472	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
10	32437	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
14	32437	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
31	Not Req'd	N/A	3.876	32434	Not Req'd	25561	25546	33934	None
455	32437	0.989	1.453	35199	32437	35202	35204	33934	32425
505	32437	0.989	1.453	35199	32437	35202	35204	33934	32425
555	32437	0.989	1.453	35199	32437	35202	35204	33934	32425
650	32435	1.275	1.877	35199	33471	N/A	N/A	33934	None
652	32435	N/A	1.875	35199	33471	35202	EITHER	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
FIAT	653		6	6.24	1.25	25498	Not Req'd	Not Req'd	25502
FIAT	655		6	6.24	1.25	25498	Not Req'd	Not Req'd	25502
FIAT	655		6.313	5.875	1.175	25498	Not Req'd	Not Req'd	25504
FIAT	HD-11	OLD	7.000	8.125	1.558	25547	22779	22777	Not Req'd
FIAT	HD-11	OLD, SEALED	7.000	8.375	1.619	25547	22779	22777	Not Req'd
FIAT	HD-11GC	NEW	7.000	8.375	1.619	25547	22779	22777	Not Req'd
FIAT	HD-21	NEW	9.000	11.625	1.995	25551	22749	Not Req'd	Not Req'd
FIAT	100C		6.688	6.750	1.372	25499	Not Req'd	Not Req'd	25502
FIAT	10B		6.938	7.875	1.451	25500	22779	22779	Not Req'd
FIAT	11B		7.000	8.375	1.620	25547	22779	22751	Not Req'd
FIAT	12G		7.85	10.27	1.876	25551	22751	22749	Not Req'd
FIAT	12GB		7.85	10.27	1.876	25551	22751	22749	Not Req'd
FIAT	16B		7.875	10.250	1.872	25551	22751	22749	Not Req'd
FIAT	21C		9.000	11.625	2.031	25501	22749	Not Req'd	Not Req'd
FIAT	411C		5.313	4.875	0.978	200281	Not Req'd	Not Req'd	25505
FIAT	41B		11.281	14	2.622	25553	Not Req'd	Not Req'd	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
653	32435	N/A	1.875	35199	33471	35202	EITHER	33934	None
655	32435	N/A	1.875	35199	33471	35202	EITHER	33934	None
655	22471	1.186	1.770	35199	33471	35202	35204	33934	32435
HD-11	32437	1.572	2.313	35199	35205	N/A	N/A	33936	None
HD-11	32437	1.631	2.500	35199	22769	N/A	N/A	33936	None
HD-11GC	32437	1.631	2.500	35199	22769	N/A	N/A	33936	None
HD-21	32441	2.021	3.040	32434	22789	25561	25546	33934	None
100C	22471	1.383	2.046	35199	35205	25562	35204	33934	33472
10B	32437	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
11B	32437	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
12G	32441	N/A	2.879	32434	22787	25563	35204	33934	None
12GB	32441	N/A	2.875	32434	22787	25563	35204	33934	None
16B	33471	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
21C	33471	N/A	N/A	32434	Not Req'd	N/A	25546	33934	None
411C	32437	0.989	1.453	35199	32437	35202	35204	33934	32425
41B	Not Req'd	N/A	3.998	32434	Not Req'd	25561	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
FIAT	450M		6.313	5.875	1.175	25498	Not Req'd	Not Req'd	25504
FIAT	500M		6.313	5.875	1.175	25498	Not Req'd	Not Req'd	25504
FIAT	60C		6.688	6.750	1.372	25499	Not Req'd	Not Req'd	25502
FIAT	70C		6.688	6.750	1.372	25499	Not Req'd	Not Req'd	25502
FIAT	AD10		6.938	8.000	1.450	25500	22779	22779	Not Req'd
FIAT	AD10B		6.929	7.87	1.458	25500	Not Req'd	22779	Not Req'd
FIAT	AD12		7.48	8.66	1.577	25547	22779	22777	Not Req'd
FIAT	AD14		7.48	8.66	1.577	25547	22779	22777	Not Req'd
FIAT	AD14B		7.48	8.66	1.577	25547	22779	22777	Not Req'd
FIAT	AD18		8.500	10.000	1.872	25551	22751	22749	Not Req'd
FIAT	AD20		8.500	10.000	1.872	25551	22751	22749	Not Req'd
FIAT	AD4		5.313	4.875	0.978	200281	Not Req'd	Not Req'd	25505
FIAT	AD5		6.313	5.875	1.175	25498	Not Req'd	Not Req'd	25504
FIAT	AD6		6.688	6.750	1.372	25499	Not Req'd	Not Req'd	25502
FIAT	AD7		6.688	6.750	1.372	25499	Not Req'd	Not Req'd	25502
FIAT	AD7C		6.688	6.750	1.372	25499	Not Req'd	Not Req'd	25502

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
450M	22471	1.186	1.770	35199	33471	35202	35204	33934	32435
500M	22471	1.186	1.770	35199	33471	35202	35204	33934	32435
60C	22471	1.383	2.046	35199	35205	25562	35204	33934	33472
70C	22471	1.383	2.046	35199	35205	25562	35204	33934	33472
AD10	32437	1.462	2.284	35199	35205	25562	35204	33936	32437
AD10B	33472	N/A	2.287	35199	35205	25562	25546	33936	None
AD12	32437	N/A	2.366	35199	22769	25562	25546	33936	None
AD14	32437	N/A	2.366	35199	22769	25562	25546	33936	None
AD14B	32437	N/A		CHECK	32437	35205	35204	33936	None
AD18	33471	1.877	2.816	35199	35206	25563	35204	33934	33471
AD20	33471	1.877	2.816	35199	35206	25563	35204	33934	33471
AD4	32437	0.989	1.453	35199	32437	35202	35204	33934	32425
AD5	22471	1.186	1.770	35199	33471	35202	35204	33934	32435
AD6	22471	1.383	2.046	35199	35205	25562	35204	33934	33472
AD7	22471	1.383	2.046	35199	35205	25562	35204	33934	33472
AD7C	22471	1.383	2.046	35199	35205	25562	35204	33934	33472

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
FIAT	AD8		6.692	7.13	1.377	25499	Not Req'd	22779	25502
FIAT	AD9		6.688	6.750	1.372	25499	Not Req'd	Not Req'd	25502
FIAT	B1		5.512	5.28	0.984	200281	Not Req'd	Not Req'd	25505
FIAT	BD10		6.938	8.000	1.450	25500	22779	22779	Not Req'd
FIAT	BD10B		6.929	7.87	1.458	25500	Not Req'd	22779	Not Req'd
FIAT	BD12		7.48	8.66	1.577	25547	22779	22777	Not Req'd
FIAT	BD14		7.48	8.66	1.577	25547	22779	22777	Not Req'd
FIAT	BD14B		7.48	8.66	1.577	25547	22779	22777	Not Req'd
FIAT	BD18		8.500	10.000	1.872	25551	22751	22749	Not Req'd
FIAT	BD20		8.500	10.000	1.872	25551	22751	22749	Not Req'd
FIAT	BD7		6.692	7.01	1.377	25499	Not Req'd	22779	25502
FIAT	BD7C		6.688	6.750	1.372	25499	Not Req'd	Not Req'd	25502
FIAT	BD8		6.692	7.13	1.377	25499	Not Req'd	22779	25502
FIAT	BD9		6.692	7.01	1.377	25499	Not Req'd	22779	25502
FIAT	DH-20		9.000	11.625	1.871	25551	22751	22749	Not Req'd
FIAT	EX200		6.906	8.346	1.442	25500	Not Req'd	22779	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
AD8	33472		2.05	35199	35205	25562	25546	33936	None
AD9	22471	1.383	2.046	35199	35205	25562	35204	33934	33472
B1	32435		1.452	35199	32437	35205	35204	33934	None
BD10	32437	1.462	2.284	35199	35205	25562	35204	33936	32437
BD10B	33472	N/A	2.287	35199	35205	25562	25546	33936	None
BD12	32437	N/A	2.366	35199	22769	25562	25546	33936	None
BD14	32437	N/A	2.366	35199	22769	25562	25546	33936	None
BD14B	32437	N/A	2.364	35199	22769	25562	25546	33936	None
BD18	33471	1.877	2.816	35199	35206	25563	35204	33934	33471
BD20	33471	1.877	2.816	35199	35206	25563	35204	33934	33471
BD7	33472	N/A	2.043	35199	35205	25562	25546	33936	None
BD7C	22471	1.383	2.046	35199	35205	25562	35204	33934	33472
BD8	33472	N/A	2.05	35199	35205	25562	25546	33936	None
BD9	33472	N/A	2.043	35199	35205	25562	25546	33936	None
DH-20	33471	1.885	2.881	32434	22771	25563	25546	33934	None
EX200	33472	N/A	2.303	35199	35205	25562	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
FIAT	EX400		8.5	10	1.875	25551	22751	22749	Not Req'd
FIAT	FA200		7.48	8.66	1.577	25547	22779	22777	Not Req'd
FIAT	FD14		7.48	8.66	1.577	25547	22779	22777	Not Req'd
FIAT	FD14D		7.48	8.66	1.577	25547	22779	22777	Not Req'd
FIAT	FD14E		7.48	8.66	1.577	25547	22779	22777	Not Req'd
FIAT	FD20	SALT	8.503	9.9	1.88	25551	22751	22749	Not Req'd
FIAT	FD20	Unsealed	8.503	9.84	1.873	25551	22751	22749	Not Req'd
FIAT	FD30		9.000	11.625	2.031	25501	22749	Not Req'd	Not Req'd
FIAT	FD30	SALT	9.035	11.65	2.036	25501	Not Req'd	Not Req'd	Not Req'd
FIAT	FD40		11.25	12.95	2.373	25553	Not Req'd	Not Req'd	Not Req'd
FIAT	FD40B		11.25	12.95	2.373	25553	Not Req'd	Not Req'd	Not Req'd
FIAT	FD5		6.299	6.42	1.26	25498	Not Req'd	Not Req'd	25502
FIAT	FD5		6.299	6.46	1.142	200281	Not Req'd	Not Req'd	25504
FIAT	FD50		11.281	14	2.622	25553	Not Req'd	Not Req'd	Not Req'd
FIAT	FD7		6.299	6.42	1.26	25498	Not Req'd	Not Req'd	25502
FIAT	FD7		6.299	6.46	1.142	200281	Not Req'd	Not Req'd	25504

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
EX400	32441	N/A	2.81	35199	22787	25563	35204	33934	None
FA200	32437	N/A	2.364	35199	22769	25562	25546	33936	None
FD14	32437	N/A	2.364	35199	22769	25562	25546	33936	None
FD14D	32437	N/A	2.364	35199	22769	25562	25546	33936	None
FD14E	32437	N/A		CHECK	32437	35205	35204	33936	None
FD20	32441	N/A	2.811	32434	22787	25563	35204	33934	None
FD20	32441	N/A	2.819	35199	22787	25563	35204	33934	None
FD30	33471	N/A	N/A	32434	Not Req'd	N/A	25546	33934	None
FD30	33474	N/A	3.194	32434	22771	25561	25546	33934	None
FD40	Not Req'd	N/A	3.88	32434	Not Req'd	25561	25546	33934	None
FD40B	Not Req'd	N/A	3.876	32434	Not Req'd	25561	25546	33934	None
FD5	32435	N/A	2.01	35199	35205	25562	25546	33934	None
FD5	32435	N/A	1.772	35199	33471	35202	EITHER	33934	None
FD50	Not Req'd	N/A	4.112	32434	Not Req'd	25561	25546	33934	None
FD7	32435	N/A	2.01	35199	35205	25562	25546	33934	None
FD7	32435	N/A	1.772	35199	33471	35205	EITHER	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
FIAT	FD9		6.692	7.17	1.382	25499	Not Req'd	22779	25502
FIAT	FE16		6.692	7.165	1.377	25499	Not Req'd	22779	25502
FIAT	FE18		6.692	7.165	1.377	25499	Not Req'd	22779	25502
FIAT	FE20		6.692	7.165	1.377	25499	Not Req'd	22779	25502
FIAT	FE20LC		6.692	7.165	1.377	25499	Not Req'd	22779	25502
FIAT	FE8LC		6.692	7.165	1.377	25499	Not Req'd	22779	25502
FIAT	FH120		6.692	7.165	1.377	25499	Not Req'd	22779	25502
FIAT	FH150		6.692	7.165	1.377	25499	Not Req'd	22779	25502
FIAT	FH150LC		6.692	7.165	1.377	25499	Not Req'd	22779	25502
FIAT	FH200		6.929	8.031	1.458	25500	Not Req'd	22779	Not Req'd
FIAT	FH200LC		6.929	8.031	1.458	25500	Not Req'd	22779	Not Req'd
FIAT	FL10		6.938	8.000	1.450	25500	22779	22779	Not Req'd
FIAT	FL12		7.48	8.66	1.577	25547	22779	22777	Not Req'd
FIAT	FL14		7.48	8.66	1.577	25547	22779	22777	Not Req'd
FIAT	FL14B		7.48	8.66	1.577	25547	22779	22777	Not Req'd
FIAT	FL14C		7.48	8.66	1.577	25547	22779	22777	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

			BUSHING REMOVAL		BUSHING INSTALL				
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
FD9	33472	N/A	2.085	35199	35205	25562	25546	33936	None
FE16	33472	N/A	2.047	35199	35205	25562	25546	33936	None
FE18	33472	N/A		CHECK	32437	35205	35204	33936	None
FE20	33472	N/A	2.047	35199	35205	25562	25546	33936	None
FE20LC	33472	N/A	2.047	35199	35205	25562	25546	33936	None
FE8LC	33472	N/A	2.047	35199	35205	25562	25546	33936	None
FH120	33472	N/A	2.047	35199	35205	25562	25546	33936	None
FH150	33472	N/A	2.047	35199	35205	25562	25546	33936	None
FH150LC	33472	N/A	2.047	35199	35205	25562	25546	33936	None
FH200	33472	N/A	2.284	35199	35205	25562	25546	33936	None
FH200LC	33472	N/A	2.284	35199	35205	25562	25546	33936	None
FL10	32437	1.462	2.284	35199	35205	25562	35204	33936	32437
FL12	32437	N/A	2.366	35199	22769	25562	25546	33936	None
FL14	32437	N/A	2.366	35199	22769	25562	25546	33936	None
FL14B	32437	N/A	2.366	35199	22769	25562	25546	33936	None
FL14C	32437	N/A	2.366	35199	22769	25562	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
FIAT	FL20	SALT	8.503	9.9	1.88	25551	22751	22749	Not Req'd
FIAT	FL20	Unsealed	8.503	9.84	1.873	25551	22751	22749	Not Req'd
FIAT	FL4C		5.313	4.875	0.978	200281	Not Req'd	Not Req'd	25505
FIAT	FL4D		5.512	5.28	0.984	200281	Not Req'd	Not Req'd	25505
FIAT	FL4L		5.512	5.28	0.984	200281	Not Req'd	Not Req'd	25505
FIAT	FL5	SALT	6.299	6.42	1.26	25498	Not Req'd	Not Req'd	25502
FIAT	FL5	Unsealed	6.299	6.46	1.142	200281	Not Req'd	Not Req'd	25504
FIAT	FL5B	SALT	6.299	6.42	1.26	25498	Not Req'd	Not Req'd	25502
FIAT	FL6		6.299	6.1	1.181	25498	Not Req'd	Not Req'd	25504
FIAT	FL6		6.313	5.875	1.175	25498	Not Req'd	Not Req'd	25504
FIAT	FL7		6.688	6.750	1.372	25499	Not Req'd	Not Req'd	25502
FIAT	FL7		6.692	7.01	1.377	25499	Not Req'd	22779	25502
FIAT	FL7/B		6.299	6.42	1.26	25498	Not Req'd	Not Req'd	25502
FIAT	FL8		6.688	6.750	1.372	25499	Not Req'd	Not Req'd	25502
FIAT	FL8C		6.692	7.01	1.377	25499	Not Req'd	22779	25502
FIAT	FL9		6.692	7.13	1.377	25499	Not Req'd	22779	25502

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
FL20	32441	N/A	2.811	32434	22787	25563	35204	33934	None
FL20	32441	N/A	2.819	35199	22787	25563	35204	33934	None
FL4C	32437	0.989	1.453	35199	32437	35202	35204	33934	32425
FL4D	32435	N/A	1.452	35199	32437	35202	35204	33934	None
FL4L	32435	N/A	1.452	35199	32437	35202	35204	33934	None
FL5	32435	N/A	2.01	35199	35205	25562	25546	33934	None
FL5	32435	N/A	1.772	35199	33471	35202	EITHER	33934	None
FL5B	32435	N/A	2.01	35199	35205	25562	25546	33934	None
FL6	32435	N/A	1.767	35199	33471	35202	EITHER	33934	None
FL6	22471	1.186	1.770	35199	33471	35202	35204	33934	32435
FL7	22471	1.383	2.046	35199	35205	25562	35204	33934	33472
FL7	33472	N/A	2.043	35199	35205	25562	25546	33936	None
FL7/B	32435	N/A	2.01	35199	35205	25562	25546	33934	None
FL8	22471	1.383	2.046	35199	35205	25562	35204	33934	33472
FL8C	33472	N/A	2.043	35199	35205	25562	25546	33936	None
FL9	33472	N/A	2.05	35199	35205	25562	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
FIAT	FP120		11.25	12.95	2.373	25553	Not Req'd	Not Req'd	Not Req'd
FIAT	H3		6	5.84	1.253	25498	Not Req'd	Not Req'd	25502
FIAT	H4		6	5.84	1.253	25498	Not Req'd	Not Req'd	25502
FIAT	HD10		7.85	8.37	1.753	25548	22777	22751	Not Req'd
FIAT	HD11		7	8.14	1.562	25547	22779	22777	Not Req'd
FIAT	HD11/B		7	8.4	1.622	25547	22779	22751	Not Req'd
FIAT	HD-115		7.000	8.375	1.619	25547	22779	22777	Not Req'd
FIAT	HD-11B		7.000	8.375	1.619	25547	22779	22777	Not Req'd
FIAT	HD11E		7	8.14	1.562	25547	22779	22777	Not Req'd
FIAT	HD-11E		7.000	8.375	1.619	25547	22779	22777	Not Req'd
FIAT	HD-11EC		7.000	8.375	1.619	25547	22779	22777	Not Req'd
FIAT	HD-11EP		7.000	8.375	1.619	25547	22779	22777	Not Req'd
FIAT	HD11G		7	8.14	1.562	25547	22779	22777	Not Req'd
FIAT	HD-11G		7.000	8.125	1.558	25547	22779	22777	Not Req'd
FIAT	HD-11GC		7.000	8.125	1.558	25547	22779	22777	Not Req'd
FIAT	HD12G		7.875	10.250	1.871	25551	22751	22749	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
FP120	Not Req'd	N/A	3.876	32434	Not Req'd	25561	25546	33934	None
H3	32435	N/A	1.75	35199	33471	35202	EITHER	33934	None
H4	32435	N/A	1.75	35199	33471	35202	EITHER	33934	None
HD10	32441	N/A	2.5	35199	22769	25562	25546	33936	None
HD11	32437	N/A	2.315	35199	35205	25562	25546	33936	None
HD11/B	32437	N/A	2.5	35199	22769	25562	25546	33936	None
HD-115	32437	1.631	2.500	35199	22769	N/A	N/A	33936	None
HD-11B	32437	1.631	2.500	35199	22769	N/A	N/A	33936	None
HD11E	32437	N/A	2.315	35199	35205	25562	25546	33936	None
HD-11E	32437	1.631	2.500	35199	22769	N/A	N/A	33936	None
HD-11EC	32437	1.631	2.500	35199	22769	N/A	N/A	33936	None
HD-11EP	32437	1.631	2.500	35199	22769	N/A	N/A	33936	None
HD11G	32437	N/A	2.315	35199	35205	25562	25546	33936	None
HD-11G	32437	1.572	2.313	35199	35205	N/A	N/A	33936	None
HD-11GC	32437	1.572	2.313	35199	35205	N/A	N/A	33936	None
HD12G	33471	1.885	2.881	32434	22771	25563	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
FIAT	HD14		7.85	9.67	1.878	25551	22751	22749	Not Req'd
FIAT	HD15		7.85	9.33	1.751	25548	22777	22751	Not Req'd
FIAT	HD-15		7.875	9.313	1.746	25548	22777	22751	Not Req'd
FIAT	HD-16	NO SEALS	7.875	9.313	1.746	25548	22777	22751	Not Req'd
FIAT	HD-16		7.875	10.250	1.871	25551	22751	22749	Not Req'd
FIAT	HD16	Sealed	7.85	10.27	1.876	25551	22751	22749	Not Req'd
FIAT	HD16	Unsealed	7.85	9.33	1.751	25548	22777	22751	Not Req'd
FIAT	HD16B		7.85	10.27	1.876	25551	22751	22749	Not Req'd
FIAT	HD16B		7.875	10.250	1.871	25551	22751	22749	Not Req'd
FIAT	HD-16D		7.875	10.250	1.871	25551	22751	22749	Not Req'd
FIAT	HD-16DC		7.875	10.250	1.871	25551	22751	22749	Not Req'd
FIAT	HD-16DD		7.875	10.250	1.871	25551	22751	22749	Not Req'd
FIAT	HD19		9	11.66	1.876	25551	22751	22749	Not Req'd
FIAT	HD-19		9.000	11.625	1.871	25551	22751	22749	Not Req'd
FIAT	HD20		9	11.66	1.876	25551	22751	22749	Not Req'd
FIAT	HD21		9	11.66	1.876	25551	22751	22749	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
HD14	32441	N/A	2.75	32434	35206	25563	35204	33934	None
HD15	32441	N/A	2.623	35199	22769	25562	35204	33934	None
HD-15	33471	1.775	2.624	32434	22769	25562	25546	33934	None
HD-16	33471	1.775	2.624	32434	22769	25562	25546	33934	None
HD-16	33471	1.885	2.881	32434	22771	25563	25546	33934	None
HD16	32441	N/A	2.879	32434	22787	25563	35204	33934	None
HD16	32441	N/A	2.623	35199	22769	25562	35204	33934	None
HD16B	32441	N/A	2.875	32434	22787	25563	35204	33934	None
HD16B	33471	1.885	2.881	32434	22771	25563	25546	33934	None
HD-16D	33471	1.885	2.881	32434	22771	25563	25546	33934	None
HD-16DC	33471	1.885	2.881	32434	22771	25563	25546	33934	None
HD-16DD	33471	1.885	2.881	32434	22771	25563	25546	33934	None
HD19	32441	N/A	2.879	32434	22787	25563	35204	33934	None
HD-19	33471	1.885	2.881	32434	22771	25563	25546	33934	None
HD20	32441	N/A	2.879	32434	22787	25563	35204	33934	None
HD21	32441	N/A	2.879	32434	22787	25563	35204	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
FIAT	HD-21	OLD	9.000	11.625	1.871	25551	22751	22749	Not Req'd
FIAT	HD-21b	NEW	9.000	11.625	1.871	25551	22751	22749	Not Req'd
FIAT	HD21B		9	11.66	1.876	25551	22751	22749	Not Req'd
FIAT	HD21C		9.035	11.66	2.036	25501	Not Req'd	Not Req'd	Not Req'd
FIAT	HD21P		9	11.66	1.876	25551	22751	22749	Not Req'd
FIAT	HD3		6	5.84	1.253	25498	Not Req'd	Not Req'd	25502
FIAT	HD31	SALT	11.25	12.95	2.373	25553	Not Req'd	Not Req'd	Not Req'd
FIAT	HD31	Unsealed	11.25	12.95	2.373	25553	Not Req'd	Not Req'd	Not Req'd
FIAT	HD-4		6.000	6.500	1.246	25498	Not Req'd	Not Req'd	25504
FIAT	HD4		6	6.24	1.25	25498	Not Req'd	Not Req'd	25502
FIAT	HD41	Sealed	11.25	12.95	2.373	25553	Not Req'd	Not Req'd	Not Req'd
FIAT	HD41	Unsealed	11.25	12.95	2.373	25553	Not Req'd	Not Req'd	Not Req'd
FIAT	HD41B		11.25	14	2.623	25553	Not Req'd	Not Req'd	Not Req'd
FIAT	HD5		7.85	8.37	1.753	25548	22777	22751	Not Req'd
FIAT	HD-5		6.500	6.875	1.379	25499	Not Req'd	22779	25502
FIAT	HD5		6.5	6.91	1.376	25499	Not Req'd	22779	25502

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
HD-21	33471	1.885	2.881	32434	22771	25563	35204	33934	None
HD-21b	33471	1.900	3.040	32434	22771	25561	25546	33934	None
HD21B	32441	N/A	3.044	32434	22771	25561	25546	33934	None
HD21C	33474	N/A	3.194	32434	22771	25561	25546	33934	None
HD21P	32441	N/A	2.875	32434	22787	25563	35204	33934	None
HD3	32435	N/A	1.75	35199	33471	35205	EITHER	33934	None
HD31	Not Req'd	N/A	3.876	32434	Not Req'd	25561	25546	33934	None
HD31	Not Req'd	N/A	3.88	32434	Not Req'd	25561	25546	33934	None
HD-4	32435	1.275	1.877	35199	33471	N/A	EITHER	33934	None
HD4	32435	N/A	1.875	35199	33471	35202	EITHER	33934	None
HD41	Not Req'd	N/A	3.876	32434	Not Req'd	25561	25546	33934	None
HD41	Not Req'd	N/A	3.88	32434	Not Req'd	25561	25546	33934	None
HD41B	Not Req'd	N/A	3.998	32434	Not Req'd	25561	25546	33934	None
HD5	32441	N/A	2.5	35199	22769	25562	25546	33936	None
HD-5	33472	1.400	2.000	35199	35205	N/A	25546	33934	None
HD5	33472	N/A	2.005	35199	35205	25562	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
FIAT	HD50		11.25	14	2.623	25553	Not Req'd	Not Req'd	Not Req'd
FIAT	HD50		11.25	14	2.622	25553	Not Req'd	Not Req'd	Not Req'd
FIAT	HD6		6.5	6.91	1.376	25499	Not Req'd	22779	25502
FIAT	HD-6		6.500	6.875	1.379	25499	Not Req'd	22779	25502
FIAT	HD-6A		6.500	6.875	1.379	25499	Not Req'd	22779	25502
FIAT	HD-6B		6.500	6.875	1.379	25499	Not Req'd	22779	25502
FIAT	HD-6E		6.500	6.875	1.379	25499	Not Req'd	22779	25502
FIAT	HD-6EP		6.500	6.875	1.379	25499	Not Req'd	22779	25502
FIAT	HD-6G		6.500	6.875	1.379	25499	Not Req'd	22779	25502
FIAT	HD7		6.5	7.51	1.736	25548	22777	22751	Not Req'd
FIAT	HD7		6.5	8.14	1.563	25547	22779	22777	Not Req'd
FIAT	HD7G		7	8.14	1.562	25547	22779	22777	Not Req'd
FIAT	HD-7GB		7.000	8.125	1.558	25547	22779	22777	Not Req'd
FIAT	HD7G-B		7	8.14	1.562	25547	22779	22777	Not Req'd
FIAT	HD9		7	8.14	1.562	25547	22779	22777	Not Req'd
FIAT	HD-9		7.000	8.125	1.558	25547	22779	22777	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
HD50	Not Req'd	N/A	3.998	32434	Not Req'd	25561	25546	33934	None
HD50	Not Req'd	N/A	4.112	32434	Not Req'd	25561	25546	33934	None
HD6	33472	N/A	2.005	35199	35205	25562	25546	33934	None
HD-6	33472	1.400	2.000	35199	35205	N/A	25546	33934	None
HD-6A	33472	1.400	2.000	35199	35205	N/A	25546	33934	None
HD-6B	33472	1.400	2.000	35199	35205	N/A	25546	33934	None
HD-6E	33472	1.400	2.000	35199	35205	N/A	25546	33934	None
HD-6EP	33472	1.400	2.000	35199	35205	N/A	25546	33934	None
HD-6G	33472	1.400	2.000	35199	35205	N/A	25546	33934	None
HD7	32441	N/A	2	35199	35205	25562	25546	33936	None
HD7	32437	N/A	2.315	35199	35205	25562	25546	33936	None
HD7G	32437	N/A	2.331	35199	22769	25562	25546	33936	None
HD-7GB	32437	1.572	2.313	35199	35205	N/A	25546	33936	None
HD7G-B	32437	N/A	2.315	35199	35205	25562	25546	33936	None
HD9	32437	N/A	2.315	35199	35205	25562	25546	33936	None
HD-9	32437	1.572	2.313	35199	35205	N/A	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
FIAT	K		6.5	7.51	1.736	25548	22777	22751	Not Req'd
FIAT	KO		6.5	7.51	1.736	25548	22777	22751	Not Req'd
FIAT	S11		6.692	7.165	1.377	25499	Not Req'd	22779	25502
FIAT	S9		6.692	7.165	1.377	25499	Not Req'd	22779	25502
FIAT	SL11		6.692	7.165	1.377	25499	Not Req'd	22779	25502
FIAT	SL9		6.692	7.165	1.377	25499	Not Req'd	22779	25502
FIAT	UH801		12.5	14.37	2.756	25553	Not Req'd	Not Req'd	Not Req'd
FOWLER	33 Challenger		8.000	10.625	1.750	25548	22777	22751	Not Req'd
FOWLER	33 Marshall		8.000	9.750	1.751	25548	22777	22751	Not Req'd
FOWLER	75 Marshall	NO COUPLING	6.750	8.250	1.308	25499	Not Req'd	Not Req'd	25502
HANOMAG	K-15		8.000	10.250	1.740	25548	22777	22751	Not Req'd
HITACHI	EX100		6.736	7.283	1.315	25499	Not Req'd	Not Req'd	25502
HITACHI	EX1100		10.25	12.578	2.29	25553	Not Req'd	Not Req'd	Not Req'd
HITACHI	EX120		6.736	7.283	1.315	25499	Not Req'd	Not Req'd	25502
HITACHI	EX1200-5		10.25	12.578	2.29	25553	Not Req'd	Not Req'd	Not Req'd
HITACHI	EX90		6.736	7.283	1.315	25499	Not Req'd	Not Req'd	25502

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
K	32441	N/A	2	35199	35205	25562	25546	33936	None
KO	32441	N/A	2	35199	35205	25562	25546	33936	None
S11	33472	N/A	2.047	35199	35205	25562	25546	33936	None
S9	33472	N/A	2.047	35199	35205	25562	25546	33936	None
SL11	33472	N/A	2.047	35199	35205	25562	25546	33936	None
SL9	33472	N/A	2.047	35199	35205	25562	25546	33936	None
UH801	Not Req'd	N/A	4.252	32434	Not Req'd	25561	25546	33934	None
33 Challenger	33471	1.775	2.629	32434	22769	25562	25546	33934	None
33 Marshall	33471	1.750	2.625	32434	22769	25562	25546	33934	None
75 Marshall	33472	1.306	2.000	35199	N/A	N/A	25546	33936	None
K-15	33471	1.775	2.621	32434	22769	22562	25546	33934	None
EX100	22471	N/A	1.315	35199	32437	35205	35204	33936	None
EX1100	33474	N/A	3.54	32434	31658	25561	25546	33934	None
EX120	22471	N/A	1.991	35199	35205	35205	25546	33936	None
EX1200-5	33474	N/A	3.54	32434	31658	25561	25546	33934	None
EX90	22471	N/A	1.991	35199	35205	35202	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
INTERTRAC	150	LDR	6.500	6.688	1.367	25499	Not Req'd	Not Req'd	25502
INTERTRAC	175	LDR	7.000	7.875	1.617	25547	22779	22777	Not Req'd
INTERTRAC	100C		6.000	6.500	1.243	25498	Not Req'd	Not Req'd	25504
INTERTRAC	100E	LDR	6.000	6.500	1.243	25498	Not Req'd	Not Req'd	25504
INTERTRAC	125C	LDR	6.500	6.688	1.367	25499	Not Req'd	Not Req'd	25502
INTERTRAC	125E	LDR	6.500	6.688	1.367	25499	Not Req'd	Not Req'd	25502
INTERTRAC	175B		7.500	8.688	1.742	25548	22777	22751	Not Req'd
INTERTRAC	175C		7.500	8.688	1.742	25548	22777	22751	Not Req'd
INTERTRAC	250-B	LDR	7.500	8.688	1.742	25548	22777	22751	Not Req'd
INTERTRAC	250-C		8.500	11.000	1.865	25551	22751	22749	Not Req'd
INTERTRAC	TD-14		7.000	7.875	1.485	25500	22779	22779	Not Req'd
INTERTRAC	TD-14A		7.000	7.875	1.485	25500	22779	22779	Not Req'd
INTERTRAC	TD-14B		7.000	7.875	1.485	25500	22779	22779	Not Req'd
INTERTRAC	TD-15	OLD	7.000	7.875	1.485	25500	22779	22779	Not Req'd
INTERTRAC	TD-15	NEW	7.000	7.875	1.617	25547	22779	22777	Not Req'd
INTERTRAC	TD15B		7.000	7.875	1.617	25547	22779	22777	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
150	33472	1.385	2.051	35199	35205	N/A	25546	33934	None
175	32437	1.636	2.364	35199	22769	N/A	25546	33936	None
100C	32435	1.259	1.801	35199	33471	N/A	EITHER	33934	None
100E	32435	1.259	1.801	35199	33471	N/A	EITHER	33934	None
125C	33472	1.385	2.051	35199	35205	N/A	25546	33934	None
125E	33472	1.385	2.051	35199	35205	N/A	25546	33934	None
175B	33471	1.760	2.614	32434	22769	25562	25546	33936	None
175C	33471	1.760	2.614	32434	22769	25562	25546	33936	None
250-B	33471	1.760	2.614	32434	22769	25562	25546	33936	None
250-C	33471	1.894	2.864	32434	22787	25563	25546	33934	None
TD-14	32437	1.510	2.239	35199	35205	N/A	25546	33936	None
TD-14A	32437	1.510	2.239	35199	35205	N/A	25546	33936	None
TD-14B	32437	1.510	2.239	35199	35205	N/A	25546	33936	None
TD-15	32437	1.510	2.239	35199	35205	N/A	25546	33936	None
TD-15	32437	1.636	2.364	35199	22769	N/A	25546	33936	None
TD15B	32437	1.636	2.364	35199	22769	N/A	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
INTERTRAC	TD-15B		7.500	8.688	1.742	25548	22777	22751	Not Req'd
INTERTRAC	TD-15C		7.500	8.688	1.742	25548	22777	22751	Not Req'd
INTERTRAC	TD-18		7.500	9.813	1.735	25548	22777	22751	Not Req'd
INTERTRAC	TD-20		7.500	9.813	1.735	25548	22777	22751	Not Req'd
INTERTRAC	TD20-B		7.500	8.688	1.742	25548	22777	22751	Not Req'd
INTERTRAC	TD-20C		8.500	11.000	1.865	25551	22751	22749	Not Req'd
INTERTRAC	TD-20E		8.500	11.000	1.865	25551	22751	22749	Not Req'd
INTERTRAC	TD-24		8.500	11.000	1.865	25551	22751	22749	Not Req'd
INTERTRAC	TD-25	OLD	8.500	11.000	1.865	25551	22751	22749	Not Req'd
INTERTRAC	TD-25B		8.500	11.000	1.865	25551	22751	22749	Not Req'd
INTERTRAC	TD-25B	NEW	9.875	11.000	2.115	25501	22749	Not Req'd	Not Req'd
INTERTRAC	TD25C		9.875	11.000	2.115	25501	22749	Not Req'd	Not Req'd
INTERTRAC	TD-30		9.875	11.000	2.115	25501	22749	Not Req'd	Not Req'd
INTERTRAC	TD-6		6.000	6.500	1.243	25498	Not Req'd	Not Req'd	25504
INTERTRAC	TD-7C		6.000	6.500	1.243	25498	Not Req'd	Not Req'd	25504
INTERTRAC	TD-7E		6.000	6.500	1.243	25498	Not Req'd	Not Req'd	25504

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
TD-15B	33471	1.760	2.614	32434	22769	25562	25546	33936	None
TD-15C	33471	1.760	2.614	32434	22769	25562	25546	33936	None
TD-18	33471	1.760	2.489	32434	22769	25562	25546	33934	None
TD-20	33471	1.760	2.489	32434	22769	25562	25546	33934	None
TD20-B	33471	1.760	2.614	32434	22769	25562	25546	33936	None
TD-20C	33471	1.894	2.864	32434	22787	25563	25546	33934	None
TD-20E	33471	1.894	2.864	32434	22787	25563	25546	33934	None
TD-24	33471	1.894	2.864	32434	22787	25563	25546	33934	None
TD-25	33471	1.894	2.864	32434	22787	25563	25546	33934	None
TD-25B	33471	1.894	2.864	32434	22787	25563	25546	33934	None
TD-25B	32441	2.144	3.239	32434	22789	25561	25546	33934	None
TD25C	32441	2.144	3.239	32434	22789	25561	25546	33934	None
TD-30	32441	2.144	3.239	32434	22789	25561	25546	33934	None
TD-6	32435	1.259	1.801	35199	33471	N/A	EITHER	33934	None
TD-7C	32435	1.259	1.801	35199	33471	N/A	EITHER	33934	None
TD-7E	32435	1.259	1.801	35199	33471	N/A	EITHER	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
INTERTRAC	TD-8C		6.500	6.688	1.367	25499	Not Req'd	Not Req'd	25502
INTERTRAC	TD-8E		6.500	6.688	1.367	25499	Not Req'd	Not Req'd	25502
INTERTRAC	TD9		6.500	6.688	1.367	25499	Not Req'd	Not Req'd	25502
INTERTRAC	TD9-B		6.500	6.688	1.367	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	291		6.125	6.456	1.181	25498	Not Req'd	Not Req'd	25504
JOHN DEERE	350		5.750	5.380	1.186	25498	Not Req'd	Not Req'd	25504
JOHN DEERE	370		8.5	10	1.873	25551	22751	22749	Not Req'd
JOHN DEERE	440		5.75	5.47	1	200281	Not Req'd	Not Req'd	25505
JOHN DEERE	450		6.290	6.100	1.374	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	455		6.290	6.100	1.374	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	490		6.734	6.97	1.317	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	550		6.290	6.100	1.374	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	555		6.290	6.100	1.374	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	590		6.75	7.598	1.366	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	650		6.290	6.100	1.374	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	655		6.909	8.11	1.44	25500	Not Req'd	22779	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

			BUSHING REMOVAL		BUSHING INSTALL				
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
TD-8C	33472	1.385	2.051	35199	35205	N/A	25546	33934	None
TD-8E	33472	1.385	2.051	35199	35205	N/A	25546	33934	None
TD9	33472	1.385	2.051	35199	35205	N/A	25546	33934	None
TD9-B	33472	1.385	2.051	35199	35205	N/A	25546	33934	None
291	32435	N/A	1.85	35199	33471	35205	EITHER	33934	None
350	32435	1.190	1.750	35199	33471	N/A	EITHER	33934	None
370	32441	N/A	2.809	35199	22787	25563	35204	33934	None
440	32435	N/A	1.56	35199	32437	35205	35204	33934	None
450	33472	1.387	2.128	35199	35205	N/A	25546	33934	None
455	33472	1.387	2.128	35199	35205	N/A	25546	33934	None
490	22471	N/A	1.99	35199	35205	35205	25546	33934	None
550	33472	1.387	2.128	35199	35205	N/A	25546	33934	None
555	33472	1.387	2.128	35199	35205	N/A	25546	33934	None
590	22471	N/A	2.116	35199	35205	25562	25546	33936	None
650	33472	1.387	2.128	35199	35205	N/A	25546	33934	None
655	33472	N/A	2.314	35199	35205	25562	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
JOHN DEERE	690		6.734	7.000	1.314	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	750		6.909	6.150	1.437	25500	22779	22779	Not Req'd
JOHN DEERE	755		6.909	6.150	1.437	25500	22779	22779	Not Req'd
JOHN DEERE	790		7.480	8.583	1.496	25500	22779	22779	Not Req'd
JOHN DEERE	792		8.000	9.646	1.750	25548	22777	22751	Not Req'd
JOHN DEERE	850		7.988	8.976	1.748	25548	22777	22751	Not Req'd
JOHN DEERE	855		8.500	9.950	1.872	25551	22751	22749	Not Req'd
JOHN DEERE	890		8.500	9.950	1.872	25551	22751	22749	Not Req'd
JOHN DEERE	892		8.500	9.950	1.872	25551	22751	22749	Not Req'd
JOHN DEERE	990		8.500	9.950	1.872	25551	22751	22749	Not Req'd
JOHN DEERE	1280		6.9	8.11	1.439	25500	Not Req'd	22779	Not Req'd
JOHN DEERE	2010		5.75	5.47	1	200281	Not Req'd	Not Req'd	25505
JOHN DEERE	1050C		8.5	10.31	2	25551	22751	Not Req'd	Not Req'd
JOHN DEERE	1050J		8.5	10.31	2	25551	22751	Not Req'd	Not Req'd
JOHN DEERE	1150D		6.678	8.11	1.44	25500	Not Req'd	22779	Not Req'd
JOHN DEERE	1155D		6.678	8.11	1.44	25500	Not Req'd	22779	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
690	33472	1.327	1.993	35199	35205	N/A	25546	33936	None
750	33472	1.449	2.316	35199	35205	N/A	25546	33934	None
755	33472	1.449	2.316	35199	35205	N/A	25546	33934	None
790	32437	1.512	2.323	35199	35205	N/A	25546	33936	None
792	33471	1.765	2.624	35199	22769	N/A	35204	33934	None
850	33471	1.750	2.626	32434	22769	25562	25546	33936	None
855	33471	1.897	2.813	32434	22787	25563	25546	33934	33471
890	33471	1.897	2.813	32434	22787	25563	25546	33934	33471
892	33471	1.897	2.813	32434	22787	25563	25546	33934	33471
990	33471	1.897	2.813	32434	22787	25563	25546	33934	33471
1280	33472	N/A	2.313	35199	35205	25562	25546	33936	None
2010	32435	N/A	1.56	35199	32437	35202	35204	33934	None
1050C	32441	N/A	3	32434	22787	25561	35204	33934	None
1050J	32441	N/A	3	32434	22787	25561	35204	33934	None
1150D	33472	N/A	2.314	35199	35205	25562	25546	33936	None
1155D	33472	N/A	2.314	35199	35205	25562	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
JOHN DEERE	190E		6.063	6.102	1.19	25498	Not Req'd	Not Req'd	25504
JOHN DEERE	2010C		5.750	5.380	1.186	25498	Not Req'd	Not Req'd	25504
JOHN DEERE	270CLC		8.5	9.52	1.76	25548	22777	22751	Not Req'd
JOHN DEERE	290D		6.125	6.456	1.181	25498	Not Req'd	Not Req'd	25504
JOHN DEERE	330CLC		8.5	9.52	1.76	25548	22777	22751	Not Req'd
JOHN DEERE	330LC		8.5	9.52	1.76	25548	22777	22751	Not Req'd
JOHN DEERE	350B		5.75	5.47	1.192	25498	Not Req'd	Not Req'd	25504
JOHN DEERE	350C		5.75	5.47	1.192	25498	Not Req'd	Not Req'd	25504
JOHN DEERE	350D		5.75	5.38	1.192	25498	Not Req'd	Not Req'd	25504
JOHN DEERE	400G		5.75	5.38	1.192	25498	Not Req'd	Not Req'd	25504
JOHN DEERE	420C		5.75	5.47	1	200281	Not Req'd	Not Req'd	25505
JOHN DEERE	450C		6.290	6.100	1.374	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	450C	Recessed	6.29	6.08	1.374	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	450C	Sealed	6.29	6.2	1.374	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	450D	Sealed	6.29	6.36	1.26	25498	Not Req'd	Not Req'd	25502
JOHN DEERE	450D	SALT	6.29	6.36	1.26	25498	Not Req'd	Not Req'd	25502

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
190E	32435	N/A	1.82	35199	33471	35202	EITHER	33934	None
2010C	32435	1.190	1.750	35199	33471	N/A	EITHER	33934	None
270CLC	32441	N/A	2.63	35199	22769	25562	35204	33934	None
290D	32435	N/A	1.85	35199	33471	35202	EITHER	33934	None
330CLC	32441	N/A	2.63	35199	22769	25562	35204	33934	None
330LC	32441	N/A	2.63	35199	22769	25562	35204	33934	None
350B	32435	N/A	1.752	35199	33471	35205	EITHER	33934	None
350C	32435	N/A	1.752	35199	33471	35205	EITHER	33934	None
350D	32435	N/A	1.752	35199	33471	35202	EITHER	33934	None
400G	32435	N/A	1.752	35199	33471	35202	EITHER	33934	None
420C	32435	N/A	1.561	35199	32437	35202	35204	33934	None
450C	33472	1.387	2.128	35199	35205	N/A	25546	33934	None
450C	33472	N/A	2.008	35199	35205	25562	25546	33934	None
450C	33472	N/A	2.128	35199	35205	25562	25546	33934	None
450D	32435	N/A	2.008	35199	35205	25562	25546	33934	None
450D	32435	N/A	2.008	35199	35205	25562	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
JOHN DEERE	450E	Sealed	6.29	6.36	1.26	25498	Not Req'd	Not Req'd	25502
JOHN DEERE	450G	Sealed	6.29	6.36	1.26	25498	Not Req'd	Not Req'd	25502
JOHN DEERE	450LC		8.5	10	1.873	25551	22751	22749	Not Req'd
JOHN DEERE	455G		6.29	6.36	1.26	25498	Not Req'd	Not Req'd	25502
JOHN DEERE	490D		6.75	7.01	1.318	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	490E		6.73	6.7	1.33	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	550A		6.29	6.36	1.26	25498	Not Req'd	Not Req'd	25502
JOHN DEERE	550G		6.29	6.36	1.26	25498	Not Req'd	Not Req'd	25502
JOHN DEERE	555A		6.29	6.36	1.26	25498	Not Req'd	Not Req'd	25502
JOHN DEERE	555G		6.734	7.22	1.318	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	590D		6.75	7.598	1.378	25499	Not Req'd	22779	25502
JOHN DEERE	605C		6.730	7.165	1.259	25498	Not Req'd	Not Req'd	25502
JOHN DEERE	650G		6.734	7.22	1.318	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	650J		6.730	7.165	1.259	25498	Not Req'd	Not Req'd	25502
JOHN DEERE	690A		6.734	6.97	1.317	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	690B		6.734	6.97	1.317	25499	Not Req'd	Not Req'd	25502

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
450E	32435	N/A	2.008	35199	35205	25562	25546	33934	None
450G	32435	N/A	2.008	35199	35205	25562	25546	33934	None
450LC	32441	N/A	2.809	35199	22787	25563	35204	33934	None
455G	32435	N/A	2.008	35199	35205	25562	25546	33934	None
490D	22471	N/A	1.984	35199	35205	35202	EITHER	33936	None
490E	22471	N/A	1.99	35199	35205	35202	25546	33934	None
550A	32435	N/A	2.008	35199	35205	25562	25546	33934	None
550G	32435	N/A	2.008	35199	35205	25562	25546	33934	None
555A	32435	N/A		CHECK	32437	35202	35204	33934	None
555G	22471	N/A	2.12	35199	35205	25562	25546	33936	None
590D	33472	N/A	2.116	35199	35205	25562	25546	33936	None
605C	32435	1.275	1.877	35199	33471	N/A	EITHER	33936	None
650G	22471	N/A	2.119	35199	35205	25562	25546	33936	None
650J	32435	1.275	1.877	35199	33471	N/A	EITHER	33936	None
690A	22471	N/A	1.99	35199	35205	35202	25546	33934	None
690B	22471	N/A	1.99	35199	35205	35202	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
JOHN DEERE	690C		6.734	6.97	1.317	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	690D		6.734	6.97	1.317	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	690E		7.48	8.15	1.437	25500	Not Req'd	22779	Not Req'd
JOHN DEERE	690E-LC		7.48	8.15	1.437	25500	Not Req'd	22779	Not Req'd
JOHN DEERE	693B		6.734	6.97	1.317	25499	Not Req'd	Not Req'd	25502
JOHN DEERE	693D		6.909	8.11	1.44	25500	Not Req'd	22779	Not Req'd
JOHN DEERE	750/B		6.909	8.11	1.44	25500	Not Req'd	22779	Not Req'd
JOHN DEERE	750C		7.48	8.125	1.437	25500	Not Req'd	22779	Not Req'd
JOHN DEERE	755/B		6.909	8.11	1.44	25500	Not Req'd	22779	Not Req'd
JOHN DEERE	755A		8	9.06	1.753	25548	22777	22751	Not Req'd
JOHN DEERE	790D		7.48	8.58	1.496	25500	Not Req'd	22779	Not Req'd
JOHN DEERE	790E		7.48	8.346	1.496	25500	Not Req'd	22779	Not Req'd
JOHN DEERE	792/D		8	9.65	1.75	25548	22777	22751	Not Req'd
JOHN DEERE	850B		7.984	9.06	1.753	25548	22777	22751	Not Req'd
JOHN DEERE	850C		7.984	9.06	1.753	25548	22777	22751	Not Req'd
JOHN DEERE	850D		10.250	12.125	2.245	25501	Not Req'd	Not Req'd	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
690C	22471	N/A	1.99	35199	35205	35202	25546	33934	None
690D	22471	N/A	1.99	35199	35205	35202	25546	33934	None
690E	33472	N/A	2.311	35199	35205	25562	25546	33936	None
690E-LC	33472	N/A	2.311	35199	35205	25562	25546	33936	None
693B	22471	N/A	1.99	35199	35205	35205	25546	33934	None
693D	33472	N/A	1.99	35199	35205	35205	25546	33936	None
750/B	33472	N/A	2.314	35199	35205	25562	25546	33936	None
750C	33472	N/A	2.402	35199	22769	25562	25546	33936	None
755/B	33472	N/A	2.314	35199	35205	25562	25546	33936	None
755A	32441	N/A	2.62	35199	22769	25562	25546	33934	None
790D	32437	N/A	2.323	35199	35205	25562	25546	33936	None
790E	32437	N/A	2.322	35199	35205	25562	25546	33936	None
792/D	32441	N/A	2.618	35199	22769	25562	25546	33934	None
850B	32441	N/A	2.621	35199	22769	25562	35204	33934	None
850C	32441	N/A	2.621	35199	22769	25562	35204	33934	None
850D	33474	N/A	3.375	32434	31658	25561	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
JOHN DEERE	850J		8	10.315	1.75	25548	22777	22751	Not Req'd
JOHN DEERE	890A		8.5	9.882	1.881	25551	22751	22749	Not Req'd
JOHN DEERE	892D		8	9.65	1.75	25548	22777	22751	Not Req'd
JOHN DEERE	892E		8	9.65	1.75	25548	22777	22751	Not Req'd
JOHN DEERE	950J		8.5	10.86	1.87	25551	22751	22749	Not Req'd
JOHN DEERE	992D		8.5	10	1.873	25551	22751	22749	Not Req'd
JOHN DEERE	992E		8.5	10	1.873	25551	22751	22749	Not Req'd
JOHN DEERE	EX120-2		6.73	6.7	1.33	25499	Not Req'd	Not Req'd	25502
Kobelco	K909A		7.48	8.58	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D120-15		9	11.3	1.988	25551	22751	22749	Not Req'd
KOMATSU	D120-18		9	11.312	1.996	25551	22749	Not Req'd	Not Req'd
KOMATSU	D120-8		9	11.312	1.996	25551	22749	Not Req'd	Not Req'd
KOMATSU	D125-18		9	11.312	1.996	25551	22749	Not Req'd	Not Req'd
KOMATSU	D150-1	OLD	9	11.312	1.996	25551	22749	Not Req'd	Not Req'd
KOMATSU	D150-1	NEW	9.000	11.312	1.918	25551	22751	22749	Not Req'd
KOMATSU	D155-1	OLD	9	11.312	1.996	25551	22749	Not Req'd	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
850J	32441	N/A	2.756	35199	35206	25563	35204	33934	None
890A	32441	N/A	2.811	32434	22787	25563	35204	33934	None
892D	32441	N/A	2.618	35199	22769	25562	25546	33934	None
892E	32441	N/A	2.618	35199	22769	25562	25546	33934	None
950J	32441	N/A	3.09	35199	22771	25561	25546	33934	None
992D	32441	N/A	2.809	35199	22787	25563	35204	33934	None
992E	32441	N/A	2.809	35199	22787	25563	35204	33934	None
EX120-2	22471	N/A	1.99	35199	35205	35205	25546	33934	None
K909A	32437	N/A	2.171	35199	35205	25562	25546	33936	None
D120-15	32441	N/A	2.854	32434	22787	25563	35204	33934	None
D120-18	32441	N/A	N/A	32434	Not Req'd	N/A	25546	33934	None
D120-8	32441	N/A	N/A	32434	Not Req'd	N/A	25546	33934	None
D125-18	32441	N/A	N/A	32434	Not Req'd	N/A	25546	33934	None
D150-1	32441	N/A	N/A	32434	Not Req'd	N/A	25546	33934	None
D150-1	33471	N/A	N/A	32434	Not Req'd	N/A	25546	33934	None
D155-1	32441	N/A	N/A	32434	Not Req'd	N/A	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
KOMATSU	D155-1	NEW	9.000	11.312	1.918	25551	22751	22749	Not Req'd
KOMATSU	D155A-1		9	11.3	1.909	25551	22751	22749	Not Req'd
KOMATSU	D155A-5		9	11.48	1.909	25551	22751	22749	Not Req'd
KOMATSU	D155AX-3		9	11.48	1.909	25551	22751	22749	Not Req'd
KOMATSU	D155AX-5		9	11.48	1.909	25551	22751	22749	Not Req'd
KOMATSU	D20	SALT	5.31	5.55	0.945	200281	Not Req'd	Not Req'd	25505
KOMATSU	D20	Sealed	5.31	5.63	0.945	200281	Not Req'd	Not Req'd	25505
KOMATSU	D20-2		5.312	5.500	0.943	200281	Not Req'd	Not Req'd	25505
KOMATSU	D20-3		5.312	5.500	0.943	200281	Not Req'd	Not Req'd	25505
KOMATSU	D21		5.312	5.500	0.943	200281	Not Req'd	Not Req'd	25505
KOMATSU	D250		10.25	12.32	2.165	25501	Not Req'd	Not Req'd	Not Req'd
KOMATSU	D30-12		6.625	6.625	1.1	200281	Not Req'd	Not Req'd	25504
KOMATSU	D30-15		6.625	6.625	1.1	200281	Not Req'd	Not Req'd	25504
KOMATSU	D30-6		6.625	6.625	1.1	200281	Not Req'd	Not Req'd	25504
KOMATSU	D30A		6.06	6.59	1.102	200281	Not Req'd	Not Req'd	25504
KOMATSU	D30S-1		6.06	6.59	1.094	200281	Not Req'd	Not Req'd	25505

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
D155-1	33471	N/A	N/A	32434	Not Req'd	N/A	25546	33934	None
D155A-1	32441	N/A	3.011	32434	22787	25561	25546	33934	None
D155A-5	32441	N/A	3.03	32434	22787	25561	25546	33934	None
D155AX-3	32441	N/A	3.03	32434	22787	25561	25546	33934	None
D155AX-5	32441	N/A	3.03	32434	22787	25561	25546	33934	None
D20	32435	N/A	1.6	35199	33471	35202	35204	33934	None
D20	32435	N/A	1.614	35199	33471	35202	35204	33934	None
D20-2	32435	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D20-3	32435	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D21	32435	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D250	33474	N/A	3.11	32434	22771	25561	25546	33934	None
D30-12	32435	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D30-15	32435	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D30-6	32435	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D30A	32435	N/A	1.772	35199	33471	35202	EITHER	33934	None
D30S-1	32435	N/A	1.772	35199	33471	35202	EITHER	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
KOMATSU	D30S-15		6.06	6.59	1.102	200281	Not Req'd	Not Req'd	25504
KOMATSU	D31		6.625	6.625	1.1	200281	Not Req'd	Not Req'd	25504
KOMATSU	D31 (PC100)		6.06	6.69	1.181	25498	Not Req'd	Not Req'd	25504
KOMATSU	D31-15		6.06	6.59	1.102	200281	Not Req'd	Not Req'd	25504
KOMATSU	D31-16		6.06	6.69	1.102	200281	Not Req'd	Not Req'd	25504
KOMATSU	D355		10.25	12.58	2.244	25501	Not Req'd	Not Req'd	Not Req'd
KOMATSU	D355-1	OLD	9.000	11.563	2.245	25501	Not Req'd	Not Req'd	Not Req'd
KOMATSU	D355-1	NEW	10.250	12.563	2.087	25501	22749	Not Req'd	Not Req'd
KOMATSU	D355-3		10.250	12.750	2.087	25501	22749	Not Req'd	Not Req'd
KOMATSU	D355A-1		10.25	12.58	2.244	25501	Not Req'd	Not Req'd	Not Req'd
KOMATSU	D355A-3		10.25	12.74	2.185	25501	Not Req'd	Not Req'd	Not Req'd
KOMATSU	D375A-1		10.25	12.61	2.244	25501	Not Req'd	Not Req'd	Not Req'd
KOMATSU	D375A-2		11.04	12.77	2.362	25553	Not Req'd	Not Req'd	Not Req'd
KOMATSU	D375A-5		11.04	12.77	2.362	25553	Not Req'd	Not Req'd	Not Req'd
KOMATSU	D37P		6.06	6.69	1.102	200281	Not Req'd	Not Req'd	25504
KOMATSU	D40	Recessed	6.89	8.58	1.488	25500	Not Req'd	22779	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
D30S-15	32435	N/A	1.772	35199	33471	35202	EITHER	33934	None
D31	32435	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D31 (PC100)	32435	N/A	1.82	35199	33471	35202	EITHER	33934	None
D31-15	32435	N/A	1.772	35199	33471	35202	EITHER	33934	None
D31-16	32435	N/A	1.772	35199	33471	35202	EITHER	33934	None
D355	33474	N/A	3.346	32434	31658	25561	25546	33934	None
D355-1	33474	N/A	N/A	32434	Not Req'd	N/A	25546	33934	None
D355-1	32441	N/A	N/A	32434	Not Req'd	N/A	25546	33934	None
D355-3	32441	N/A	N/A	32434	Not Req'd	N/A	25546	33934	None
D355A-1	33474	N/A	3.346	32434	31658	25561	25546	33934	None
D355A-3	33474	N/A	3.346	32434	31658	25561	25546	33934	None
D375A-1	33474	N/A	3.648	32434	Not Req'd	25561	25546	33934	None
D375A-2	Not Req'd	N/A	3.86	32434	Not Req'd	25561	25546	33934	None
D375A-5	Not Req'd	N/A	3.876	32434	Not Req'd	25561	25546	33934	None
D37P	32435	N/A	1.85	35199	33471	35202	EITHER	33934	None
D40	32437	N/A	2.165	35199	35205	25562	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
KOMATSU	D40	SALT	6.89	7.13	1.377	25499	Not Req'd	22779	25502
KOMATSU	D40	Sealed	6.89	7.17	1.382	25499	Not Req'd	22779	25502
KOMATSU	D40-1		6.875	8.5625	1.494	25500	22779	22779	Not Req'd
KOMATSU	D40P-1		6.906	8.661	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D41	S/N 216338 & U	6.89	7.17	1.382	25499	Not Req'd	22779	25502
KOMATSU	D41	SALT	6.89	7.17	1.382	25499	Not Req'd	22779	25502
KOMATSU	D41	Sealed	6.89	7.17	1.382	25499	Not Req'd	22779	25502
KOMATSU	D41	Unsealed	6.89	7.17	1.382	25499	Not Req'd	22779	25502
KOMATSU	D41-6		6.75	7.224	1.307	25499	Not Req'd	Not Req'd	25502
KOMATSU	D41A.S.P.Q-3		6.906	8.661	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D41PX-12		6.875	7.845	1.432	25500	Not Req'd	22779	Not Req'd
KOMATSU	PC240		7.677	7.48	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D45		6.89	8.58	1.488	25500	Not Req'd	22779	Not Req'd
KOMATSU	D450		8.858	8.66	1.85	25551	22751	22749	Not Req'd
KOMATSU	D45-1		6.875	8.5625	1.494	25500	22779	22779	Not Req'd
KOMATSU	D455		12.5	14.37	2.756	25553	Not Req'd	Not Req'd	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
D40	33472	N/A	2.043	35199	35205	25562	25546	33936	None
D40	33472	N/A	2.085	35199	35205	25562	25546	33936	None
D40-1	32437	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
D40P-1	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D41	33472	N/A	2.085	35199	35205	25562	25546	33936	None
D41	33472	N/A	2.085	35199	35205	25562	25546	33936	None
D41	33472	N/A	2.085	35199	35205	25562	25546	33936	None
D41	33472	N/A	2.179	35199	35205	25562	25546	33936	None
D41-6	32435	N/A	2.283	35199	35205	25562	25546	33936	None
D41A.S.P.Q-3	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D41PX-12	33472	N/A	2.365	35199	22769	25562	25546	33936	None
PC240	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D45	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D450	32441	N/A	2.803	35199	35206	25563	35204	33936	None
D45-1	32437	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
D455	Not Req'd	N/A	4.25	32434	Not Req'd	25561	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
KOMATSU	D455A-1		12.5	14.37	2.756	25553	Not Req'd	Not Req'd	Not Req'd
KOMATSU	D45A		6.906	8.661	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D45B		6.906	8.661	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D45P-1		6.89	7.17	1.382	25499	Not Req'd	22779	25502
KOMATSU	D50		6.89	7.13	1.377	25499	Not Req'd	22779	25502
KOMATSU	D50-10		6.875	8.5625	1.494	25500	22779	22779	Not Req'd
KOMATSU	D50-11		6.875	8.5625	1.494	25500	22779	22779	Not Req'd
KOMATSU	D50-11		6.89	8.58	1.488	25500	Not Req'd	22779	Not Req'd
KOMATSU	D50-15		6.875	8.5625	1.494	25500	22779	22779	Not Req'd
KOMATSU	D50-15		6.89	8.58	1.488	25500	Not Req'd	22779	Not Req'd
KOMATSU	D50A		6.906	8.661	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D50B		6.906	8.661	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D50P		6.906	8.661	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D50S		6.906	8.661	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D53	SALT	6.89	7.13	1.377	25499	Not Req'd	22779	25502
KOMATSU	D53	S/N 1334 & UP	6.89	7.17	1.382	25499	Not Req'd	22779	25502

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
D455A-1	Not Req'd	N/A	4.25	32434	Not Req'd	25561	25546	33934	None
D45A	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D45B	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D45P-1	33472	N/A	2.085	35199	35205	25562	25546	33936	None
D50	33472	N/A	2.043	35199	35205	25562	25546	33936	None
D50-10	32437	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
D50-11	32437	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
D50-11	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D50-15	32437	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
D50-15	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D50A	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D50B	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D50P	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D50S	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D53	33472	N/A	2.043	35199	35205	25562	25546	33936	None
D53	33472	N/A	2.085	35199	35205	25562	25546	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
KOMATSU	D53-15		6.875	8.5625	1.494	25500	22779	22779	Not Req'd
KOMATSU	D53-16		6.89	7.17	1.382	25499	Not Req'd	22779	25502
KOMATSU	D53A		6.906	8.661	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D53A-15		6.89	7.17	1.382	25499	Not Req'd	22779	25502
KOMATSU	D55-2		7.5	8.562	1.494	25500	22779	22779	Not Req'd
KOMATSU	D55-3		7.5	8.562	1.494	25500	22779	22779	Not Req'd
KOMATSU	D55-S		7.48	8.58	1.488	25500	Not Req'd	22779	Not Req'd
KOMATSU	D57-1		7.48	8.66	1.5	25500	Not Req'd	22777	Not Req'd
KOMATSU	D58		6.89	7.13	1.377	25499	Not Req'd	22779	25502
KOMATSU	D58E		6.906	8.661	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D58P-1		6.906	8.661	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D60		8	9.43	1.75	25548	22777	22751	Not Req'd
KOMATSU	D60-1		6.875	8.5625	1.494	25500	22779	22779	Not Req'd
KOMATSU	D60-3		7.5	8.562	1.494	25500	22779	22779	Not Req'd
KOMATSU	D60-6		8	9.4375	1.756	25548	22777	22751	Not Req'd
KOMATSU	D60A	Recessed	7.48	8.58	1.488	25500	Not Req'd	22779	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
D53-15	32437	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
D53-16	33472	N/A	2.085	35199	35205	25562	25546	33936	None
D53A	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D53A-15	33472	N/A	2.085	35199	35205	25562	25546	33936	None
D55-2	32437	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
D55-3	32437	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
D55-S	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D57-1	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D58	33472	N/A	2.043	35199	35205	25562	25546	33936	None
D58E	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D58P-1	32437	N/A	2.165	35199	35205	25562	25546	33936	None
D60	32441	N/A	2.618	35199	22769	25562	25546	33934	None
D60-1	32437	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
D60-3	32437	N/A	N/A	35199	Not Req'd	N/A	25546	33936	None
D60-6	33471	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D60A	32437	N/A		CHECK	32437	35202	35204	33936	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
KOMATSU	D60A	Sealed	7.984	9.449	1.756	25548	22777	22751	Not Req'd
KOMATSU	D61E		7.48	8.897	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D61EX		7.48	8.897	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D61P		7.48	8.897	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D61PX		7.48	8.897	1.496	25500	Not Req'd	22779	Not Req'd
KOMATSU	D63E		6.89	7.13	1.377	25499	Not Req'd	22779	25502
KOMATSU	D65-6		8	9.4375	1.756	25548	22777	22751	Not Req'd
KOMATSU	D65A	S/N 6842 & DN	7.984	9.449	1.756	25548	22777	22751	Not Req'd
KOMATSU	D65E		8	9.43	1.75	25548	22777	22751	Not Req'd
KOMATSU	D65EX-12		8	9.433	1.75	25548	22777	22751	Not Req'd
KOMATSU	D65P-6		8	9.43	1.75	25548	22777	22751	Not Req'd
KOMATSU	D65PX-12		8	9.433	1.75	25548	22777	22751	Not Req'd
KOMATSU	D66	SALT	8	9.53	1.75	25548	22777	22751	Not Req'd
KOMATSU	D66	Sealed	8	9.43	1.75	25548	22777	22751	Not Req'd
KOMATSU	D68	SALT	8	9.53	1.75	25548	22777	22751	Not Req'd
KOMATSU	D68	Sealed	8	9.43	1.75	25548	22777	22751	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
D60A	32441	N/A	2.63	35199	22769	25562	35204	33934	None
D61E	32437	N/A	2.56	35199	22769	25562	25546	33936	None
D61EX	32437	N/A	2.56	35199	22769	25562	25546	33936	None
D61P	32437	N/A	2.56	35199	22769	25562	25546	33936	None
D61PX	32437	N/A	2.56	35199	22769	25562	25546	33936	None
D63E	33472	N/A	2.043	35199	35205	25562	25546	33936	None
D65-6	33471	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D65A	32441	N/A	2.618	35199	22769	25562	25546	33934	None
D65E	32441	N/A	2.618	35199	22769	25562	25546	33934	None
D65EX-12	32441	N/A	2.618	35199	22769	25562	25546	33934	None
D65P-6	32441	N/A	2.618	35199	22769	25562	25546	33934	None
D65PX-12	32441	N/A	2.618	35199	22769	25562	25546	33934	None
D66	32441	N/A	2.751	35199	35206	25563	35204	33934	None
D66	32441	N/A	2.618	35199	22769	25562	25546	33934	None
D68	32441	N/A	2.75	35199	35206	25563	35204	33934	None
D68	32441	N/A	2.618	35199	22769	25562	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
KOMATSU	D75		8.5	10	1.85	25551	22751	22749	Not Req'd
KOMATSU	D75-2		8.500	9.875	1.851	25551	22751	22749	Not Req'd
KOMATSU	D75-3		8.500	9.875	1.851	25551	22751	22749	Not Req'd
KOMATSU	D75-S		8.5	9.84	1.85	25551	22751	22749	Not Req'd
KOMATSU	D80		8.5	10	1.85	25551	22751	22749	Not Req'd
KOMATSU	D80-12		8.5	9.875	1.851	25551	22751	22749	Not Req'd
KOMATSU	D80-7		8.000	9.875	1.754	25548	22777	22751	Not Req'd
KOMATSU	D80-8		8.000	9.875	1.754	25548	22777	22751	Not Req'd
KOMATSU	D85-12		8.5	9.875	1.851	25551	22751	22749	Not Req'd
KOMATSU	D85-18		8.5	10	1.85	25551	22751	22749	Not Req'd
KOMATSU	D85-7		8.000	9.875	1.754	25548	22777	22751	Not Req'd
KOMATSU	D85-8		8.000	9.875	1.754	25548	22777	22751	Not Req'd
KOMATSU	D85A		8.5	10	1.85	25551	22751	22749	Not Req'd
KOMATSU	D85A-12		8.5	9.84	1.85	25551	22751	22749	Not Req'd
KOMATSU	D85E		8.5	10	1.85	25551	22751	22749	Not Req'd
KOMATSU	D85E-12		8.5	9.84	1.772	25551	22751	22751	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
D75	32441	N/A	2.925	35199	22787	25563	35204	33934	None
D75-2	33471	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D75-3	33471	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D75-S	32441	N/A	2.803	35199	35206	25563	35204	33934	None
D80	32441	N/A	2.925	35199	22787	25563	35204	33934	None
D80-12	33471	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D80-7	33471	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D80-8	33471	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D85-12	33471	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D85-18	32441	N/A	2.925	35199	22787	25563	35204	33934	None
D85-7	33471	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D85-8	33471	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D85A	32441	N/A	2.295	35199	35205	25562	25546	33934	None
D85A-12	32441	N/A	2.803	35199	35206	25563	35204	33934	None
D85E	32441	N/A	2.925	35199	22787	25563	35204	33934	None
D85E-12	32441	N/A	2.795	35199	35206	25563	35204	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
KOMATSU	D85P-18		8.5	10	1.85	25551	22751	22749	Not Req'd
KOMATSU	D95		8.5	10	1.85	25551	22751	22749	Not Req'd
KOMATSU	D95-1		8.500	10.000	1.772	25551	22777	22751	Not Req'd
KOMATSU	D95-S		8.5	10	1.772	25551	22751	22751	Not Req'd
KOMATSU	EX1800		12.5	14.45	2.756	25553	Not Req'd	Not Req'd	Not Req'd
KOMATSU	PC100		6.06	6.811	1.181	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC100		6.89	6.81	1.18	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC1000		10.25	12.61	2.244	25501	Not Req'd	Not Req'd	Not Req'd
KOMATSU	PC100-1		6.062	6.535	1.181	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC100-2		6.062	6.535	1.181	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC100-3		6.062	6.535	1.181	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC100-6		6.89	6.81	1.18	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC120		6.06	6.811	1.181	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC120		6.89	6.81	1.18	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC120-1		6.062	6.535	1.181	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC120-2		6.062	6.535	1.181	25498	Not Req'd	Not Req'd	25504

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
D85P-18	32441	N/A	2.925	35199	22787	25563	35204	33934	None
D95	32441	N/A	2.925	35199	22787	25563	35204	33934	None
D95-1	33471	N/A	N/A	35199	Not Req'd	N/A	25546	33934	None
D95-S	32441	N/A	2.8	35199	35206	25563	35204	33934	None
EX1800	Not Req'd	N/A	4.567	32434	Not Req'd	25561	25546	33934	None
PC100	32435	N/A	1.811	35199	33471	35205	EITHER	33934	None
PC100	32435	N/A	1.81	35199	33471	35202	EITHER	33934	None
PC1000	33474	N/A	3.62	32434	31658	25561	25546	33934	None
PC100-1	32435	N/A	1.819	35199	33471	35202	EITHER	33934	None
PC100-2	32435	N/A	1.819	35199	33471	35202	EITHER	33934	None
PC100-3	32435	N/A	1.819	35199	33471	35202	EITHER	33934	None
PC100-6	32435	N/A	1.82	35199	33471	35202	EITHER	33934	None
PC120	32435	N/A	1.82	35199	33471	35202	EITHER	33934	None
PC120	32435	N/A	1.81	35199	33471	35202	EITHER	33934	None
PC120-1	32435	N/A	1.819	35199	33471	35202	EITHER	33934	None
PC120-2	32435	N/A	1.819	35199	33471	35202	EITHER	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
KOMATSU	PC120-3		6.062	6.535	1.181	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC120-6		6.9	6.811	1.181	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC120LC-6		6.89	6.81	1.18	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC130-6		6.89	6.81	1.18	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC138		6.89	6.81	1.18	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC150		6.89	8.66	1.499	25500	Not Req'd	22779	Not Req'd
KOMATSU	PC200		7.48	8.66	1.5	25500	Not Req'd	22777	Not Req'd
KOMATSU	PC220		7.48	8.66	1.5	25500	Not Req'd	22777	Not Req'd
KOMATSU	PC250LC-6		8.5	9.52	1.75	25548	22777	22751	Not Req'd
KOMATSU	PC270LC-6		8.5	9.52	1.75	25548	22777	22751	Not Req'd
KOMATSU	PC270LC-7		8.5	9.52	1.75	25548	22777	22751	Not Req'd
KOMATSU	PC275A-2		10.25	12.61	2.244	25501	Not Req'd	Not Req'd	Not Req'd
KOMATSU	PC300	EXC	8	9.53	1.75	25548	22777	22751	Not Req'd
KOMATSU	PC300HD-6		9	9.92	1.85	25551	22751	22749	Not Req'd
KOMATSU	PC300LC-6		8.5	9.52	1.75	25548	22777	22751	Not Req'd
KOMATSU	PC300LC-7		8.5	9.52	1.75	25548	22777	22751	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
PC120-3	32435	N/A	1.819	35199	33471	35202	EITHER	33934	None
PC120-6	32435	N/A	1.81	35199	33471	35202	EITHER	33934	None
PC120LC-6	32435	N/A	1.82	35199	33471	35202	EITHER	33934	None
PC130-6	32435	N/A	1.82	35199	33471	35202	EITHER	33934	None
PC138	32435	N/A	1.82	35199	33471	35202	EITHER	33934	None
PC150	32437	N/A	2.179	35199	35205	25562	25546	33936	None
PC200	32437	N/A	2.165	35199	35205	25562	25546	33936	None
PC220	32437	N/A	2.165	35199	35205	25562	25546	33936	None
PC250LC-6	32441	N/A	2.62	35199	22769	25562	25546	33934	None
PC270LC-6	32441	N/A	2.62	35199	22769	25562	25546	33934	None
PC270LC-7	32441	N/A	2.62	35199	22769	25562	25546	33934	None
PC275A-2	33474	N/A		CHECK	32437	35202	35204	33934	None
PC300	32441	N/A	2.618	35199	22769	25562	25546	33934	None
PC300HD-6	32441	N/A	2.8	35199	35206	25563	35204	33934	None
PC300LC-6	32441	N/A	2.62	35199	22769	25562	25546	33934	None
PC300LC-7	32441	N/A	2.62	35199	22769	25562	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
KOMATSU	PC400		8.5	10	1.85	25551	22751	22749	Not Req'd
KOMATSU	PC400LC-5		8.5	9.921	1.856	25551	22751	22749	Not Req'd
KOMATSU	PC-400 EX		8.504	10	1.85	25551	22751	22749	Not Req'd
KOMATSU	PC60 EXC		5.31	5.55	0.945	200281	Not Req'd	Not Req'd	25505
KOMATSU	PC600		8.5	10	1.85	25551	22751	22749	Not Req'd
KOMATSU	PC600-6		9	11.41	1.92	25551	22751	22749	Not Req'd
KOMATSU	PC600-7		9	11.41	1.92	25551	22751	22749	Not Req'd
KOMATSU	PC600LC-6		9	11.41	1.92	25551	22751	22749	Not Req'd
KOMATSU	PC600LC-7		9	11.41	1.92	25551	22751	22749	Not Req'd
KOMATSU	PC650-5		10.25	12.61	2.185	25501	Not Req'd	Not Req'd	Not Req'd
KOMATSU	PC700		10.25	12.61	2.185	25501	Not Req'd	Not Req'd	Not Req'd
KOMATSU	PC710		10.25	12.61	2.185	25501	Not Req'd	Not Req'd	Not Req'd
KOMATSU	PC750 SE-6		10.25	12.61	2.185	25501	Not Req'd	Not Req'd	Not Req'd
KOMATSU	PC80		6.06	6.811	1.181	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC800		10.25	12.61	2.185	25501	Not Req'd	Not Req'd	Not Req'd
KOMATSU	PC80-1		6.062	6.535	1.181	25498	Not Req'd	Not Req'd	25504

WTC Machinery
MPP 100 Tooling Chart

MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
PC400	32441	N/A	2.925	35199	22787	25563	35204	33934	None
PC400LC-5	32441		2.811	35199	22787	25563	35204	33934	
PC-400 EX	32441	N/A	2.925	35199	22787	25563	35204	33934	None
PC60 EXC	32435	N/A	1.6	35199	33471	35205	35204	33934	None
PC600	32441	N/A	2.79	35199	35206	25563	35204	33934	None
PC600-6	32441	N/A	2.87	32434	22787	25563	35204	33934	None
PC600-7	32441	N/A	2.87	32434	22787	25563	35204	33934	None
PC600LC-6	32441	N/A	2.87	32434	22787	25563	35204	33934	None
PC600LC-7	32441	N/A	2.87	32434	22787	25563	35204	33934	None
PC650-5	33474	N/A	3.445	32434	31658	25561	25546	33934	None
PC700	33474	N/A	3.445	32434	31658	25561	25546	33934	None
PC710	33474	N/A	3.445	32434	31658	25561	25546	33934	None
PC750 SE-6	33474	N/A	3.445	32434	31658	25561	25546	33934	None
PC80	32435	N/A	1.811	35199	33471	35202	EITHER	33934	None
PC800	33474	N/A	3.445	32434	31658	25561	25546	33934	None
PC80-1	32435	N/A	1.819	35199	33471	35202	EITHER	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
KOMATSU	PC80-3		6.062	6.535	1.181	25498	Not Req'd	Not Req'd	25504
KOMATSU	PC80LC-3		6.062	6.535	1.181	25498	Not Req'd	Not Req'd	25504
KUBOTO	KH170L EXC		5.31	5.51	0.994	200281	Not Req'd	Not Req'd	25505
LIEBHERR	944		6.735	7	1.314	25499	Not Req'd	Not Req'd	25502
LIEBHERR	PR711		6.735	7.22	1.315	25499	Not Req'd	Not Req'd	25502
LIEBHERR	PR721		6.735	8.12	1.442	25500	Not Req'd	22779	Not Req'd
LIEBHERR	PR731		7.985	9.06	1.752	25548	22777	22751	Not Req'd
LIEBHERR	R912		6.735	7	1.314	25499	Not Req'd	Not Req'd	25502
LIEBHERR	R922		6.735	7	1.314	25499	Not Req'd	Not Req'd	25502
LIEBHERR	R932		6.735	8.13	1.442	25500	Not Req'd	22779	Not Req'd
LINKBELT	LS2800		6.735	8.13	1.442	25500	Not Req'd	22779	Not Req'd
LINKBELT	LS4800		8.5	9.88	1.878	25551	22751	22749	Not Req'd
LINKBELT	LS5400		8.5	9.88	1.878	25551	22751	22749	Not Req'd
LINKBELT	LS5800		8.5	9.88	1.878	25551	22751	22749	Not Req'd
LINKBELT	LS6400		9	11.44	2.003	25551	22751	Not Req'd	Not Req'd
LINKBELT	LS7400		9	11.44	2.003	25551	22751	Not Req'd	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

			BUSHING REMOVAL		BUSHING INSTALL				
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
PC80-3	32435	N/A	1.819	35199	33471	35202	EITHER	33934	None
PC80LC-3	32435	N/A	1.819	35199	33471	35202	EITHER	33934	None
KH170L EXC	32435	N/A	0.662	CHECK	32437	35202	35204	33934	None
944	22471	N/A		CHECK	32437	35202	35204	33936	None
PR711	22471	N/A	2.205	35199	35205	25562	25546	33936	None
PR721	33472	N/A	2.312	35199	35205	25562	25546	33936	None
PR731	32441	N/A	2.621	35199	22769	25562	35204	33934	None
R912	22471	N/A	1.993	35199	35205	35202	25546	33936	None
R922	22471	N/A	1.993	35199	35205	35202	25546	33936	None
R932	33472	N/A	2.188	35199	35205	25562	25546	33936	None
LS2800	33472	N/A	2.188	35199	35205	25562	25546	33936	None
LS4800	32441	N/A	2.812	32434	22787	25563	35204	33934	None
LS5400	32441	N/A	2.812	32434	22787	25563	35204	33934	None
LS5800	32441	N/A	2.812	32434	22787	25563	35204	33934	None
LS6400	32441	N/A	2.996	32434	22787	25563	35204	33934	None
LS7400	32441	N/A	2.996	32434	22787	25563	35204	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
LINKBELT	LS7800		6.735	8.13	1.442	25500	Not Req'd	22779	Not Req'd
LINKBELT	LS9800		7.985	9.88	1.752	25548	22777	22751	Not Req'd
MASSEY FERGUSON	MF200B		5.512	5.75	1.063	200281	Not Req'd	Not Req'd	25505
MASSEY FERGUSON	MF2244		5.512	5.42	0.984	200281	Not Req'd	Not Req'd	25505
MASSEY FERGUSON	MF300	Recessed	6.299	6.61	1.299	25499	Not Req'd	Not Req'd	25502
MASSEY FERGUSON	MF300	Sealed	6.299	6.61	1.299	25499	Not Req'd	Not Req'd	25502
MASSEY FERGUSON	MF400C		6.69	7.01	1.38	25499	Not Req'd	22779	25502
MASSEY FERGUSON	MF450		6.299	6.61	1.299	25499	Not Req'd	Not Req'd	25502
MASSEY FERGUSON	MF500		6.69	7.17	1.378	25499	Not Req'd	22779	25502
MASSEY FERGUSON	MF500B		6.75	8.11	1.441	25500	Not Req'd	22779	Not Req'd
MASSEY FERGUSON	MF600C		7.98	8.66	1.752	25548	22777	22751	Not Req'd
MASSEY FERGUSON	MFD400C		6.69	7.01	1.38	25499	Not Req'd	22779	25502
MASSEY FERGUSON	MFD700C		8.5	9.88	1.88	25551	22751	22749	Not Req'd
O&K	RH40C		10.25	12.52	2.28	25553	Not Req'd	Not Req'd	Not Req'd
TEREX	8220		8.000	9.188	1.749	25548	22777	22751	Not Req'd
TEREX	8230		8.000	11.500	1.745	25548	22777	22751	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

				BUSHING REMOVAL		BUSHING INSTALL			
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)	REAR FORCING PIN (J)	SPECIAL TOOLING
LS7800	33472	N/A	2.118	35199	35205	25562	25546	33936	None
LS9800	32441	N/A	2.621	35199	22769	25562	35204	33934	None
MF200B	32435	N/A	1.654	35199	33471	35202	35204	33934	None
MF2244	32435	N/A	1.468	35199	32437	35202	35204	33934	None
MF300	32435	N/A	1.968	35199	35205	35202	EITHER	33934	None
MF300	32435	N/A	1.968	35199	35205	35202	EITHER	33934	None
MF400C	33472	N/A	2.048	35199	35205	25562	25546	33936	None
MF450	32435	N/A	1.968	35199	35205	35205	EITHER	33934	None
MF500	33472	N/A	2.048	35199	35205	25562	25546	33936	None
MF500B	33472	N/A	2.122	35199	35205	25562	25546	33936	None
MF600C	32441	N/A	2.618	35199	22769	25562	25546	33936	None
MFD400C	33472	N/A	2.048	35199	35205	25562	25546	33936	None
MFD700C	32441	N/A	2.811	32434	22787	25563	35204	33934	None
RH40C	33474	N/A	3.62	32434	N/A	25561	25546	33934	None
8220	33471	1.769	2.624	35199	22769	N/A	35204	33934	None
8230	33471	1.768	2.624	32434	22771	25561	25546	33934	None

WTC Machinery
MPP 100 Tooling Chart

				MASTER PIN RMOVAL AND INSTALLATION					
MAKE	MODEL	COMMENTS	PITCH	PIN LENGTH	PIN DIA	FORCING PIN (A)	ALIGNING BUSHING (2)(B)		PILOT PIN ©
							REMOVAL	INSTALL	
TEREX	8240	OLD	8.000	11.500	1.745	25548	22777	22751	Not Req'd
TEREX	8240	NEW	9.000	12.563	1.994	25551	22749	Not Req'd	Not Req'd
TEREX	8280		9.000	12.563	1.994	25551	22749	Not Req'd	Not Req'd
TEREX	82-20AA		8	9.19	1.75	25548	22777	22751	Not Req'd
TEREX	82-30		8	9.19	1.75	25548	22777	22751	Not Req'd
TEREX	82-30FA		8	11.52	1.75	25548	22777	22751	Not Req'd
TEREX	82-40AA		8	11.52	1.75	25548	22777	22751	Not Req'd
TEREX	8240CA		9.000	12.500	1.994	25551	22749	Not Req'd	Not Req'd
TEREX	8240DA		9.000	12.500	1.994	25551	22749	Not Req'd	Not Req'd
TEREX	82-50		10.312	12.38	2.38	25553	Not Req'd	Not Req'd	Not Req'd
TEREX	82-80DA		9	12.38	2	25551	22751	Not Req'd	Not Req'd
TEREX	C-260		8.000	11.500	1.745	25548	22777	22751	Not Req'd
TEREX	C-6		8.000	11.500	1.745	25548	22777	22751	Not Req'd
TEREX	TC-12		9.000	12.563	1.994	25551	22749	Not Req'd	Not Req'd
VOLVO	EC150LC		7.5	8.188	1.496	25500	Not Req'd	22779	Not Req'd

WTC Machinery
MPP 100 Tooling Chart

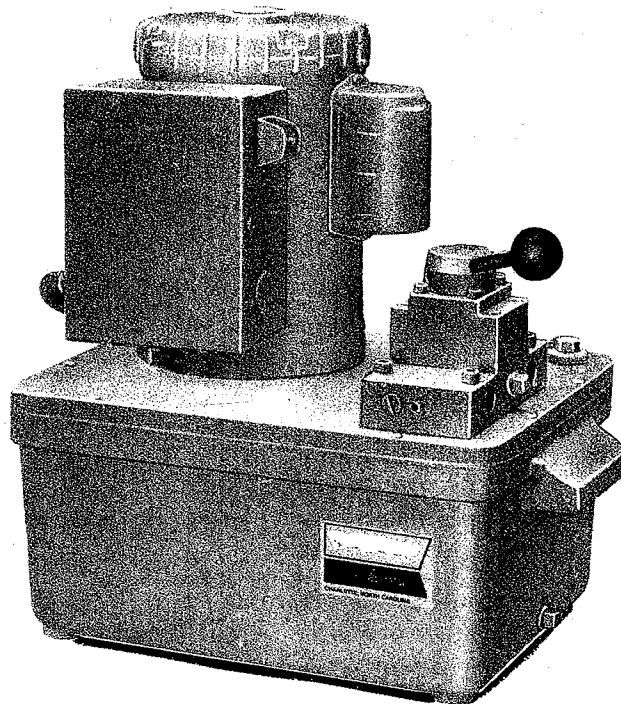
MODEL	ALIGNING ADAPTOR (D)	BUSHING ID	BUSHING OD	BUSHING REMOVAL		BUSHING INSTALL		REAR FORCING PIN (J)	SPECIAL TOOLING
				BUSHING PUSHER (E)	BUSHING ADAPTER (F)	REAR BUSH ASSY PLATE (G)	BUSHING INSTALLER (H)		
8240	33471	1.768	2.624	32434	22771	25561	25546	33934	None
8240	32441	2.019	2.992	32434	22789	25561	25546	33934	None
8280	32441	2.019	2.992	32434	22789	25561	25546	33934	None
82-20AA	32441	N/A	2.88	35199	22787	25563	35204	33934	None
82-30	32441	N/A	2.88	35199	22787	25563	35204	33934	None
82-30FA	32441	N/A	2.88	35199	22787	25563	35204	33934	None
82-40AA	32441	N/A	2.88	35199	22787	25563	35204	33934	None
8240CA	32441	2.019	2.992	32434	22787	N/A	35204	33934	None
8240DA	32441	2.019	2.992	32434	22787	N/A	35204	33934	None
82-50	Not Req'd	N/A	3.5	32434	31658	25561	25546	33934	None
82-80DA	32441	N/A	3.19	32434	22771	25561	25546	33934	None
C-260	33471	1.768	2.624	32434	22771	25561	25546	33934	None
C-6	33471	1.768	2.624	32434	22771	25561	25546	33934	None
TC-12	32441	2.019	2.992	32434	22789	25561	25546	33934	None
EC150LC	32437	N/A	2.323	35199	35205	25562	25546	33936	None

RAM-PAC

INTERNATIONAL, INC.

MAINTENANCE AND OVERHAUL INSTRUCTIONS PUBLICATION PART NO. X-7999

POWER PUMPS



**MODEL 560
SERIES A**

IMPORTANT — CAUTION

This manual contains important information for the correct installation, operation and maintenance of the equipment described herein. All persons involved in such installation, operation and maintenance should be thoroughly familiar with the contents. To safeguard against the possibility of personal injury or property damage, follow the recommendations and instructions of this manual and keep it for further reference.

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WARRANTY

Unless otherwise stated herein, Seller will repair or replace, without charge f.o.b. point of shipment any parts proven to Seller's satisfaction and upon Seller's examination to have been defective in material or workmanship when furnished, provided claim is made within 90 days after date of shipment. Deterioration or wear occasioned by abuse, severe eccentric loading, overloading, chemical or abrasive action or excessive heat shall not constitute defects. Equipment and accessories not of the Seller's manufacture are warranted only to the extent that they are warranted by the manufacturers, and this warranty is applicable only if the defect was the result of normal use, application and service, and is void if the product or any part thereof was tampered with, repaired or altered by any person other than the factory or authorized repair station. **THERE ARE NO OTHER WARRANTIES, EXPRESS, STATUTORY, OR IMPLIED, INCLUDING THAT OF MERCHANTABILITY AND OF FITNESS.**

If you have any questions on warranty repair, please contact a convenient Ram-Pac warehouse location for the name and address of your nearest Ram-Pac power pump warranty repair facility.

RAM-PAC INTERNATIONAL, INC
SUBSIDIARY OF HADER INDUSTRIES, INC
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NEW BERLIN, WI 53151 U.S.A.
PHONE 262-641-6200 FAX 262-641-5310

SECTION I

INTRODUCTION

1-1 General

This manual provides instructions for maintenance and overhaul of Duff-Norton Ram-Pac power pumps, Model 560 series. To ensure safe and long satisfactory use of the power pumps, the instructions should be closely followed. These power pumps are designed to be used as a power source for hydraulic jacks (rams). Since the safe use of jacks is covered in American National Standard ANSI B30.1, owners and operators of power pumps used with jacks are advised to read that standard. That standard contains important rules designed primarily to prevent or minimize injury and otherwise protect life, limb and property.

NOTE

Use hose and accessories approved for 10,000 PSI service with Model 560 series pumps.

1-2 Description

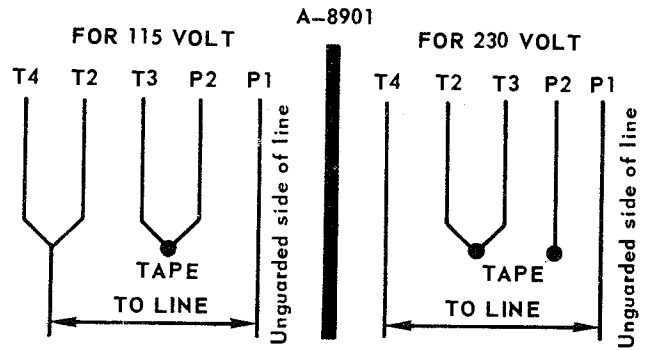
The hydraulic pump (see figure 1-1) is a precision built, two stage unit delivering high flow up to 450 psi for fast extension of rams to the point of contact with the load. See figure 3-4 for schematic.

The second stage provides high pressure up to 10,000 psi to operate rams at rated loads. The first stage unit is a gear pump and the second stage consists of three radial piston pumps. Shifting from first to second stage is done automatically thru the pressure sensing unloading valve. See figure 3-5 for schematic.

The pump is available with four power sources:

a. Model HEP-560 is powered by an electric motor. The standard electric motor, part no. X-7438, is a dual voltage, 115/230 volt, single phase motor. Unless otherwise requested, this motor is set up at the factory for 115 volt AC operation. As a precaution, operators should check the voltage connection inside the motor starter box before connecting the motor.

(1) Plug the motor into a 30 amp circuit. Current of the motor at 115 volts and with pump pumping at 10,000 psi is 25 amps.



THERMALLY PROTECTED MOTOR

WIRING DIAGRAM

(2) If required, an electrician may make a relatively easy field conversion to 230 volt AC single phase. The following information is provided for that purpose.

Motor Starter Furnas #41NB20AF

115 volt coil - Duff-Norton No. X-7300, Furnas No. D54760001

230 volt coil - Duff-Norton No. X-7259, Furnas No. D54760002

Motor Duff-Norton X-7438, 1-1/2 HP, single phase, 115/230 volt capacitor start, induction run. Rotation C. C. W viewed from shaft end.

b. Model HGP-560 is powered by a 3-1/2 HP four cycle Briggs and Stratton engine which is shipped without oil in the crankcase.

(1) Obtain locally, any high quality SAE 30 detergent oil with oil container marked "MS", "SC", "SD" or "SE". Fill the crankcase with oil to point of overflow or to "FULL" mark if engine is equipped with dipstick.

(2) Fill fuel tank with clean, fresh, lead-free or

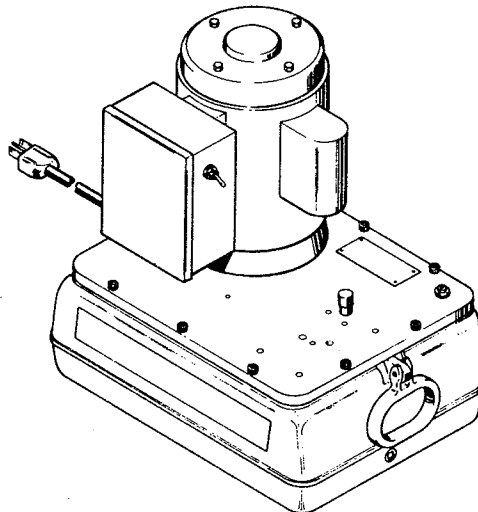


FIGURE 1-1. MODEL HEP-560 SERIES POWER PUMP

leaded "Regular" grade automotive gasoline. Do not mix oil with the gasoline.

CAUTION

Do not add fuel to HGP-560 engine while engine is operating. Always allow engine to cool before refueling. Do not run the engine in an enclosed area. Refer to Briggs and Stratton Operating and Maintenance Instructions.

c. Model HAP-560 is powered by a 3 HP air motor, part no. X-7456, which operates on 62 cfm of air at 100 psi to deliver 45 cubic inches per minute of oil at 10,000 psi. To achieve maximum operating life and trouble free service, Duff-Norton recommends the filter-regulator-lubricator combination, part no. HA-53. A 40 micron throw-away filter cartridge is in the bowl. Lubricate with SAE #10 oil to feed at a rate of 1 to 3 drops per minute.

(1) Connect the motor to a 100 psi air supply. The minimum hose recommended is 1/2 inch I.D.

d. Model HUP-560 is powered by a 115 volt, single phase, 50/60 Hz universal electric motor. Current of the motor at 115 volts and with pump delivering 10,000 psi is 15 amps.

A manifold or directional valve must be attached to the cover before the pump can be put into operation. The manifold or valve contains a pressure relief valve which can be adjusted for pressures between 1,000 and 10,000 psi.

The filler plug is equipped with a breather which maintains atmospheric pressure in the reservoir as oil is pumped out of or back into the reservoir. A porous bronze screen prevents dust particles from entering. A drain plug in the bottom of the reservoir simplifies draining of the oil.

CAUTION

HEP-560, HGP-560, and HUP-560 Models are not acceptable for use in atmospheres containing explosive vapors or gases.

**TABLE 1-1. FLOW-560 SERIES
(In Cubic Inches Per Minute)**

	HEP	HAP	HGP	HUP
Rapid Approach @ 150 PSI	480	480	400	350
High Pressure @ 10,000 PSI	56	45	50	33

SECTION II

MAINTENANCE

2-1 General

Perform the following maintenance procedures at the designated intervals. Always keep filler hole closed with the filler plug (29, figure 4-1) to prevent airborne dust from entering the reservoir. When not in use, close all pipe ports and connections to prevent airborne dust from entering the system. Contaminated or damaged pipe ports and connections will not seal when in use. The valve pad, see figure 3-2, must be covered when valve has been removed to guard against contamination. This can be done with masking tape and/or plastic plugs over connecting holes and drain holes.

2-2 Hydraulic Oil

Change oil every 100 hours of operation or every 90 days, whichever occurs earlier. The following conditions would warrant more frequent changes.

- very dusty environment and dust enters reservoir
- hourly operations near 140°F — evidence of oxidation and formation of gum, sludge, varnish
- exposure to frequent extreme temperature changes and high humidity resulting in excessive condensation in the reservoir while in storage

Operation of the pump with contaminated or oxidized oil will cause:

- a. Wear and early failure of the precision pump or of valves and rams due to rusting or lack of proper lubrication.
- b. Shrinking or swelling of seals in the pump or in valves and rams causing excessive wear and leaks of seals.

The large filler hole and the bottom drain hole provide easy access for examining the quality of the oil. A quick and easy field check of the oil would consist of a comparison against new unused oil as follows:

- a. Visual Inspection —
Presence of contaminants, liquid or solid.
Color, new oil versus used oil.
- b. Odor Inspection —
New oil versus used oil.
- c. Touch Inspection —
New oil versus used oil, rub between finger checking for grittiness, etc.

Any unusual differences noted would suggest either one of two courses of action before further operation of the pump:

- a. Follow up with lab analysis of the oil to explain unusual differences noted.
- b. Drain and discard used oil — refill with new oil.

Use only the recommended Duff-Norton power pump oil HA-57 (H-7800) which has the following properties:

Viscosity @ 100°F	290-330
Viscosity @ 210°F	50-55
Viscosity Index	95
Pour Point, °F	+ 5
Oxidation Inhibited	Yes
Rust Inhibited	Yes
Antifoam Inhibited	Yes
Flash Point, °F	430
Fire Point, °F	450
Aniline Point, °F	231

The above oil is provided for ambient temperatures above 40°F. For below 40°F operations contact the Duff-Norton Company for cold weather operating recommendations.

2-3 Filter Screen

Clean filter screen in the bottom of the reservoir every 200 hours of operation or as required.

a. Remove 10 cap screws (21, figure 4-1) and lift motor and reservoir cover off the reservoir. Do not damage gasket.

b. Remove filter screen assembly (33, figure 4-2) from the bottom of pump by removing three cap screws (32).

c. Place filter screen assembly in an acid-free solvent bath and flush thoroughly removing all foreign particles.

NOTE

Replace damaged filter screen.

d. Reassemble all parts removed from the pump.

2-4 Gasoline Engine

When operating a pump with gasoline engine, the following maintenance procedures should be observed.

a. With engine level check oil level before starting engine and after every five hours of operation. Add oil as necessary to keep level full to point of overflowing or

to "FULL" mark on dipstick.

b. Change oil after each 25 hours of operation.

c. Clean and re-oil air cleaner after each 25 hours of operation. Wash oil-foam element in kerosene or liquid detergent and dry. Then saturate with engine oil and squeeze to distribute and remove excess oil.

d. Keep engine and rotating screen clean — if cylinder fins become plugged remove blower housing and clean fins to prevent damage from overheating.

e. Empty the fuel tank before storage, and run the engine until it stops.

2-5 Air Motor

If a HA-53 filter regulator lubricator combination is being used with the motor, replace the throw-away filter cartridge at least once a year.

2-6 Motor Drive Interchange

The various motor drives may be interchanged in the field by personnel acquainted with this power pump. To interchange motors, the reservoir cover must be disconnected from the reservoir by removing 10 cap screws. Remove the motor drive and other parts identified in the parts list for figure 4-1. Replace with the desired motor drive and associated listed parts.

NOTE

Direction of motor rotation is counterclockwise viewed from shaft end.

SECTION III

OVERHAUL

3-1 General

This section contains instructions for overhaul of the 560 Series Pump. Special tools and test equipment required for overhaul are listed in table 3-1. Paragraph 3-3 provides complete disassembly instructions. Cleaning and Repair or Replacement are contained in paragraphs 3-4 and 3-5. Paragraph 3-6 contains instructions for assembly. Instructions for testing of the unloading valve and high pressure pump assemblies are also contained in paragraph 3-6. Paragraph 3-7 provides instructions for testing of the complete 560 Series Pump.

3-2 Special Tools and Test Equipment

Special tools and test equipment required for overhaul of the pumps are listed in table 3-1.

3-3 Disassembly

To disassemble the 560 Series Pump refer to figure 4-1 and proceed as follows:

CAUTION

Handle all parts with extreme care and keep them protected from dust, dirt and other foreign matter. Careless handling or failure to protect from contamination could

cause the pump to malfunction. Drain gasoline from engine on HGP-560 Models.

a. Remove plugs (29 and 30) and drain oil.

b. Remove four cap screws and manifold or valve from reservoir. See figure 3-2.

c. Remove connector (68, figure 4-2). Remove "o" rings (69) and back-up rings (69a) from connector.

d. Remove cap screws (21) and separate pump and cover assembly (31) from reservoir (28). Remove gasket (22).

e. If replacement is required, remove decals (25, 32 and 33), rivets (26) and nameplate (27).

f. Model HEP-560 & HUP-560 Pumps Only. Remove cap screws (18) and lock washers (19) and separate electric motor (1) from pump and cover assembly (31). Remove gasket (20) and coupling (5).

f. Model HAP-560 Pumps Only. Remove cap screws (18) and lock washers (19) and separate air motor (2) from pump and cover assembly (31). Remove gasket (20) and coupling (5).

TABLE 3-1. SPECIAL TOOLS AND TEST EQUIPMENT

PART NUMBER	TOOLING SOURCE	NOMENCLATURE	USE
TX-7416-A-B	Duff-Norton	Removal Tool	See para. 3-3.h.(1) & 3-6.c.(5)
FIG 3-1, A	User	Installation Tool	See para. 3-3.k.(5), 3-6.b.(2) & 3-6.b.(3)
FIG 3-1, B	User	Installation Tool	See para. 3-3.k.(5), 3-6.b.(4) & 3-6.b.(5)
None	User	Test Stand	Testing Pump and Components

f. Model HGP-560 Pumps Only.

- (1) Remove cap screws (18) and lock washers (19).
- (2) Separate gasoline engine (6) from pump and cover assembly (31). Remove gasket (20) and oil seal (17).
- (3) Remove nuts (16), lock washers (15) and cap screws (7) to disassemble motor adaptor (14) from engine (6).
- (4) Remove cap screw (13), lock washer (12), coupling (11), and woodruff key (10) from engine (6) shaft.

g. Refer to figure 4-2 for remainder of disassembly. Remove fluid line tubing (1 and 2) and tube fittings (3, 4, 5 and 6). Remove return pipe (7).

h. Remove three cap screws (8), unloading valve assembly (9) and "o" ring (31). Refer to detail A, figure 4-2 and disassemble unloading valve assembly as follows:

- (1) Remove female adaptor (10), spring guide (11), check spring (12) and check ball (13) from valve body (30). If high pressure valve seat (14) is to be removed, unscrew the seat with Duff-Norton tool number TX-7416-A-B. To prevent damage to seat, make sure the tool engages all four slots in the seat during removal. Remove gasket (15) from seat or cavity in valve body (30).
- (2) Remove adjusting screw (16), relief spring (17) and poppet (18) from valve body (30).
- (3) Remove actuator plug (19), gasket (20), ac-

	TOOL A	TOOL B
A	.67	1.11
B	.495	.870
C	.010	.010
D	.72	.72
E	.36	.36

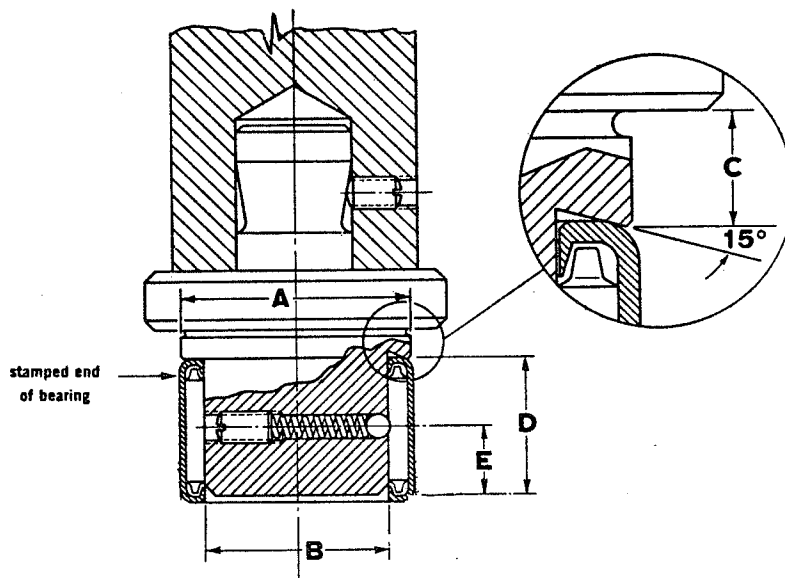


FIGURE 3-1. BEARING INSTALLATION TOOL

tuator (21), "u" cup (22) and modular ring (23) from valve body (30).

(4) Remove pipe plugs (24) only if replacement is required.

(5) Remove adjusting screw (25), unloading spring (26), ball centering pin (27) and check ball (28) from valve body (30). Do not remove ball seat (29) from valve body (30). This is a permanent press assembly.

i. Refer to detail B, figure 4-2 and remove three cap screws (32) and filter assembly (33). Further disassembly of filter assembly (33) is not recommended.

j. Remove six cap screws (39) and separate low pressure pump assembly (40) from high pressure pump assemblies (64).

CAUTION

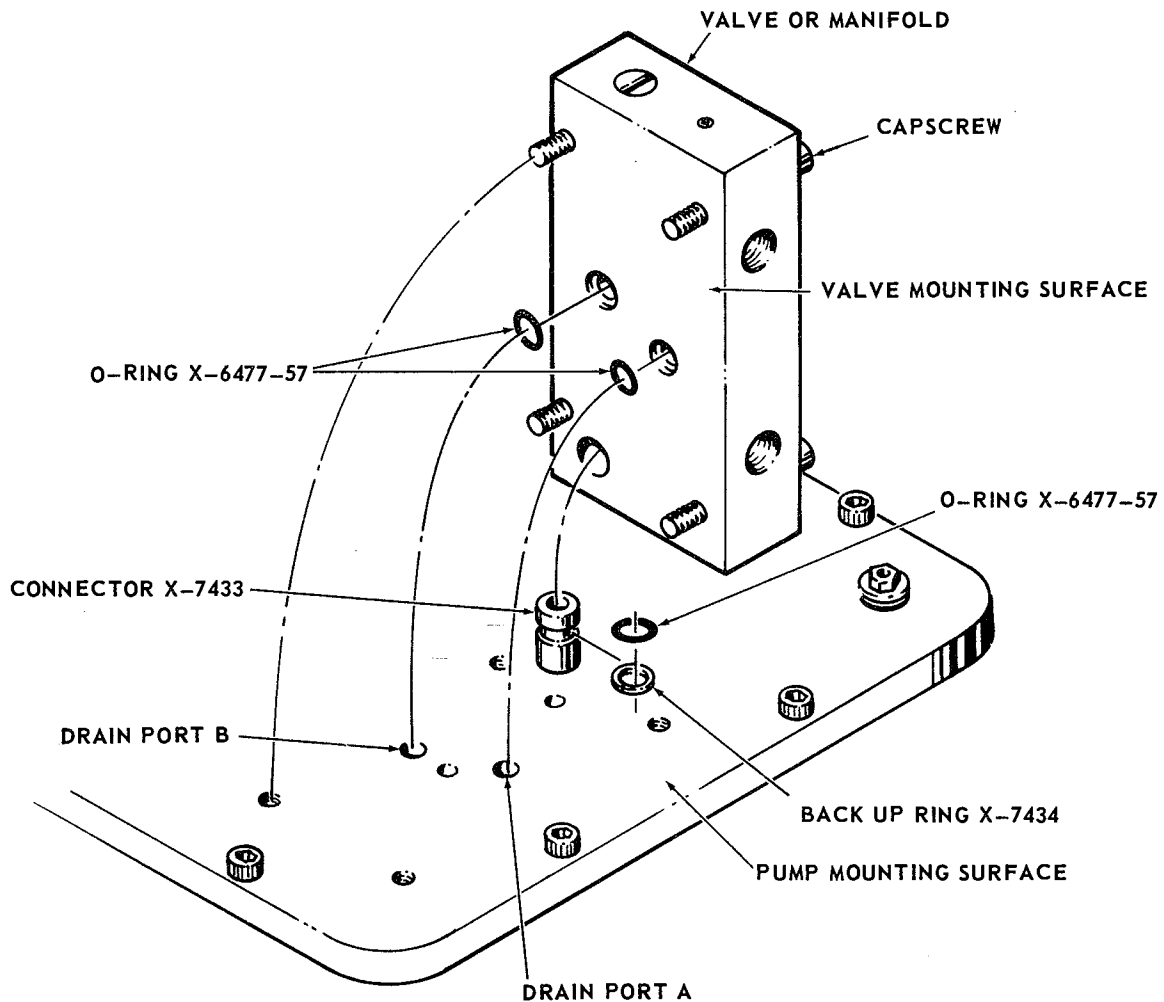
Low Pressure Pump Assembly, X-7400-A, and High Pressure Pump Assembly (3 required), X-7410-A, are select fitted assemblies. The following parts are select fitted and are not interchangeable.

Assembly Number	Figure 4-2 Index No.	Part Name
X-7400-A	57	Bottom Plate
	58	Middle Plate
	59	Top Plate
	49	Drive Gear
	51	Gear
X-7410-A	78	Piston
	70	Piston Block

Disassembly is not generally recommended as the above listed parts cannot be replaced individually. High pressure pump assemblies can be tested individually to determine whether they are defective. Test procedures and acceptance criteria are listed in paragraphs 3-6.a.(5) and 3-6.a.(7).

Under certain circumstances, disassembly may be required. For example, check balls, check springs, and bearings are interchangeable and if in need of repair, call for the following disassembly procedure.

k. Refer to detail B, figure 4-2 along with figure 3-3



O-RING SPECS
X-6477-57, SIZE 012, 1/2 x 3/8 x 1/16, 90 DURO

FIGURE 3-2. MANIFOLD OR VALVE MOUNTING

and disassemble low pressure pump assembly as follows:

(1) Remove pin (45), retaining ring (43) and bearing (44).

(2) Remove four nuts (41) and cap screws (42). Press out dowel pins (46) and carefully separate bottom plate (57), middle plate (58) and top plate (59).

(3) Remove "o" rings (47 and 48) and drive gear (49).

(4) Remove high pressure shaft (53). Remove retaining rings (50), gear (51) and woodruff key (52) from high pressure shaft.

(5) If bearings (54, 55 and 56) are to be replaced, use the proper installation tool to remove bearings from plates (57, 58 and 59). Use tool (Fig. 3-1, A) for bearing (54), and tool (Fig. 3-1, B) for bearings (55 and 56).

(6) Remove pipe plug (60) only if replacement is required.

l. Remove high pressure plate (65) from reservoir cover (66) by removing four cap screws (61) and lock washers (62). Remove cap screws (63) and high pressure pump assemblies (64) from high pressure plate (65). Remove pipe plugs (26) only if replacement is required.

m. Refer to detail C, figure 4-2, along with figure 3-4 and disassemble the three high pressure pumps (64) as follows:

with that of another. These are select fit assemblies.

(1) Remove "o" ring (76), outlet spacer (74), valve spring (72) and check ball (71) from piston block (70).

(2) Remove cap screw (77), copper gasket (75), inlet spacer (73), valve spring (72) and check ball (71) from piston block (70).

(3) See above caution if piston (78) is removed from piston block (70).

(4) Remove pipe plug (24) only if replacement is required.

3-4 Cleaning

When the power pump is disassembled, soak all components and agitate in acid-free cleaning solvent to ensure cleaning. Stubborn deposits of dirt and other contaminants can be removed from parts by using a stiff-bristled brush dipped in the solvent. Several parts of the pump have ports or recesses in which dirt can be trapped. Check these carefully. Dry parts with compressed air at approximately 20 psi or with a clean cloth. After drying dip all ferrous parts in Duff-Norton HA-57 hydraulic oil.

CAUTION:

Ensure that adequate ventilation is provided when using cleaning solvent. Wear protective clothing and avoid prolonged contact with solvents.

CAUTION

Do not interchange piston (78) from one pump assembly

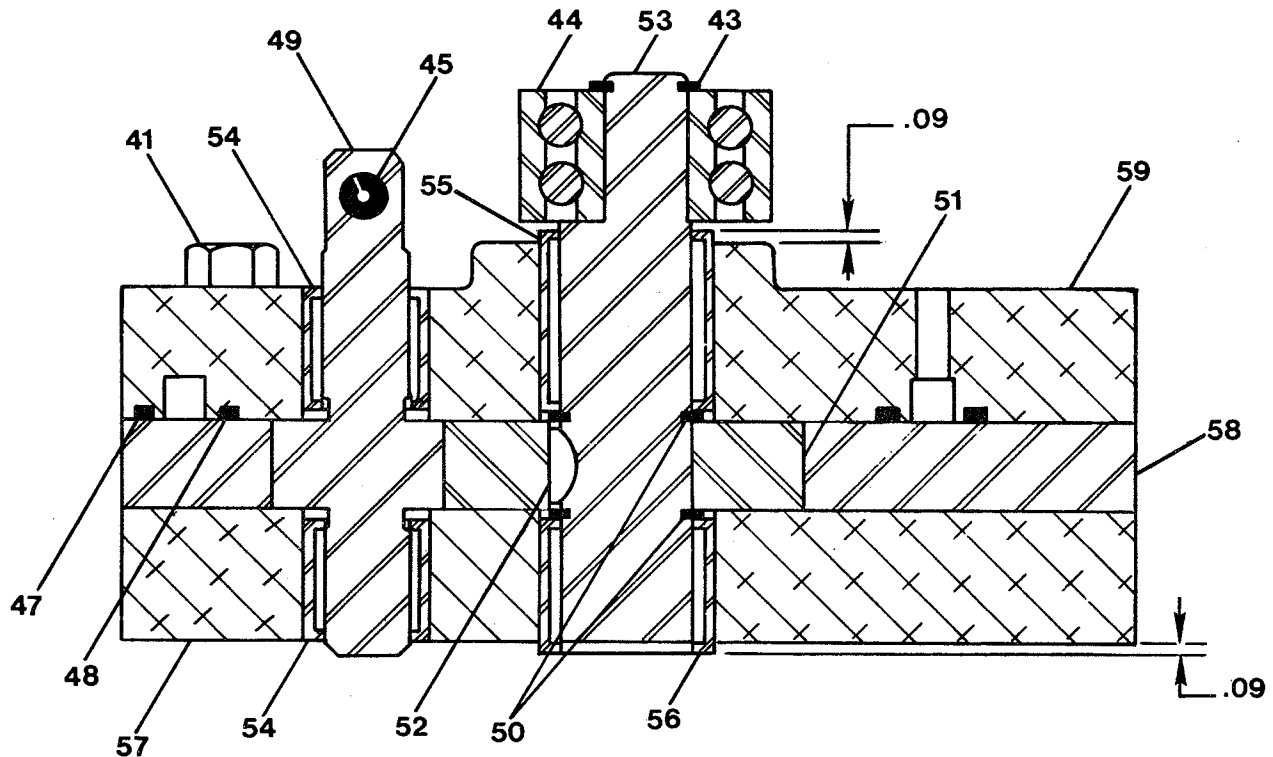


FIGURE 3-3. CUTAWAY VIEW OF LOW PRESSURE PUMP

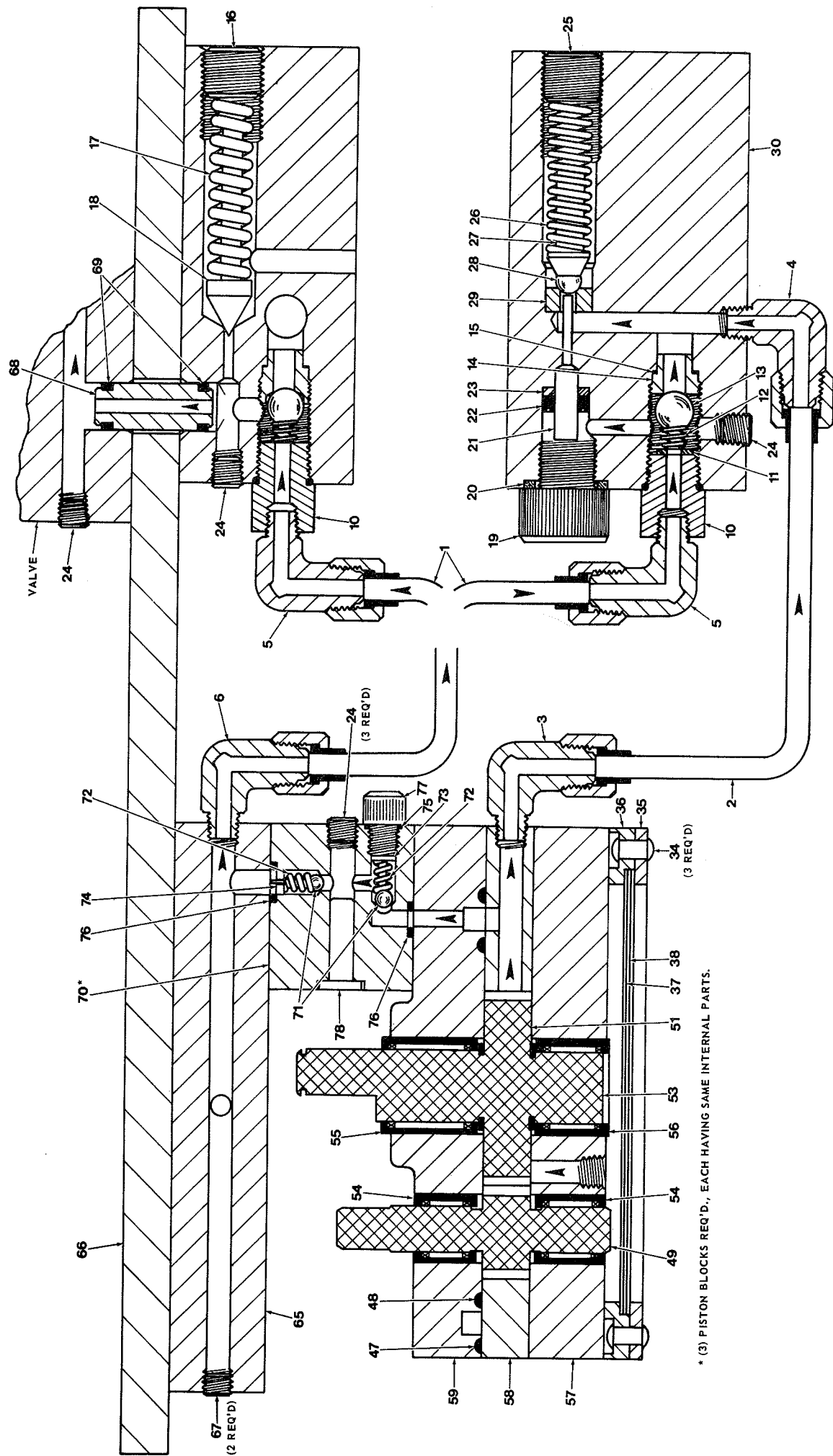


FIGURE 3-4. LOW PRESSURE SCHEMATIC

* (3) PISTON BLOCKS REQ'D., EACH HAVING SAME INTERNAL PARTS.

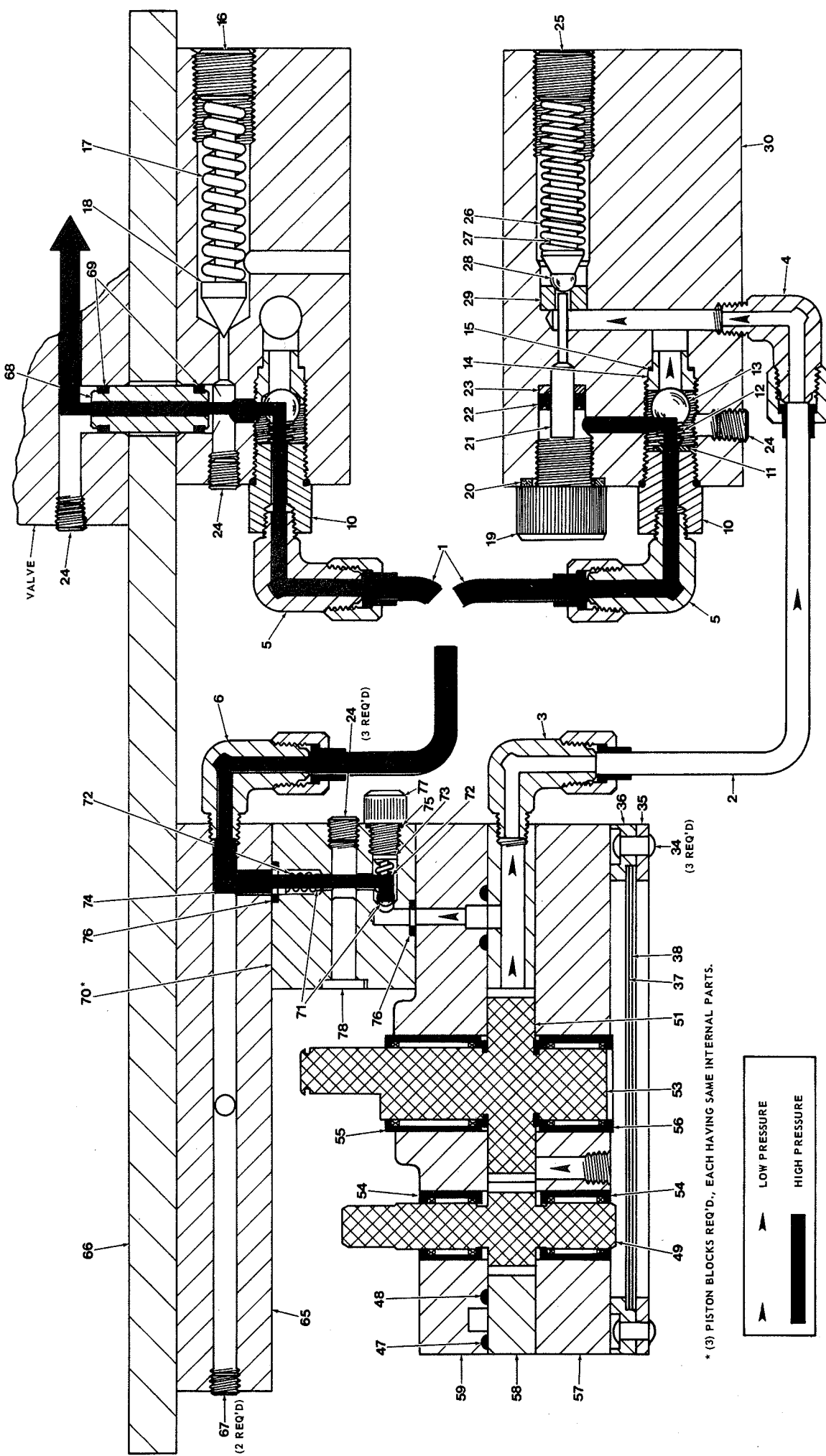


FIGURE 3-5. HIGH PRESSURE SCHEMATIC

3-5 Repair or Replacement

a. Examine all parts for defects and excessive wear. Replace any parts found to be defective except those for which repairs are delineated below. Discard and replace all check balls, springs, "o" rings, back-up rings, "u" cups and gaskets removed during disassembly.

b. Remove light nicks, shallow scratches, surface blemishes and minor corrosion on parts with crocus cloth. Thoroughly clean after this operation. Do not use crocus cloth on assemblies as this will tend to contaminate assemblies.

c. Check and repair ball seats, if required, in unloading valve as follows:

(1) Examine the two ball seats using a strong light to permit a close visual inspection. Remove any foreign particles (such as lint, packings, scale and metal chips) lodged in the seat. If the ball seat is in good condition, it will show up as a very narrow (less than 1/64 inch), ring-shaped, shiny surface around the lip of the smaller hole against which the ball seats.

(2) If the ball seat appears defective, minor imperfections such as very shallow indentations can be corrected through reseating. To reseat balls (13 and 28, figure 4-2) drop a new ball of the correct diameter into the seat and reseat it using a punch and 1/2 pound hammer. One very light tap of the hammer is sufficient, since the seats can be easily distorted. Discard this ball and use a new ball for assembly.

3-6 Assembly

To assemble the 560 Series Pump refer to figure 4-2 and proceed as follows:

a. Refer to detail C, figure 4-2, along with figure 3-4 and assemble the three high pressure pumps (64) as follows. See caution in paragraph 3-3.j.

(1) Dip all high pressure pump parts in hydraulic oil and assemble wet.

(2) Assemble inlet check ball (71), valve spring (72), inlet spacer (73), copper gasket (75) and cap screw (77) in piston block (70). Torque cap screw to 35 inch-pounds.

(3) If piston (78) was removed, install piston in piston block (70).

(4) If pipe plug (24) was removed, apply thread sealant and install.

(5) Place high pressure pump assembly into test stand and pressurize outlet port to test the inlet check ball and seat for leakage. Remove from test stand.

(6) Assemble outlet check ball (71), valve spring (72), outlet spacer (74), and "o" ring (76) in piston block (70). Remove piston (78) from piston block (70).

(7) Reinstall high pressure pump assembly into test stand and again pressurize outlet port, this time in order to test for outlet check ball leakage. Remove high pressure pump assembly from test stand and reinstall piston (78) into piston block (70).

b. Refer to detail B, figure 4-2 and figure 3-3 to

assemble low pressure pump assembly (40) as follows. See caution in paragraph 3-3.j.

(1) If pipe plug (60) was removed, apply thread sealant and install plug in plate (58).

(2) Using installation tool (fig. 3-1,A), press bearing (54) into plate (57) until bearing is flush with outside of plate as shown in figure 3-3.

(3) Using installation tool (fig. 3-1,A), press bearing (54) into plate (59) until bearing is flush with outside of plate as shown in figure 3-3.

(4) Using installation tool (fig. 3-1,B), press bearing (56) into plate (57) until bearing protrudes 0.09 inch from outside edge of plate as shown in figure 3-3.

(5) Using installation tool (fig. 3-1,B), press bearing (55) into plate (59) until bearing protrudes 0.09 inch from outside of plate as shown in figure 3-3.

NOTE

Make sure all parts of the pump are free of nicks and clean at this point. The plates must be clean and free of nicks and foreign materials to provide the necessary clearances for high efficiency flow.

(6) Dip all pump parts in hydraulic oil and assemble wet.

(7) Install woodruff key (52), gear (51) and retaining rings (50) on high pressure shaft (53).

(8) Place drive gear (49) and high pressure shaft (53) in plate (57). Place plate (58) over gears on plate (57). Install "o" rings (47 and 48) in plate (59) grooves and place plate (59) over gear shafts on plate (58).

(9) Install dowel pins (46) and attach plates together with four cap screws (42) and nuts (41). Carefully torque nuts (41) in rotation, always making sure that shafts do not bind. Torque to 50 inch-pounds.

(10) Install bearing (44) and retaining ring (43). Press pin (45) into drive gear (49) shaft until an equal amount of pin protrudes from each side of shaft.

(11) Make sure drive gear (49) can be turned freely by hand.

c. Refer to detail A, figure 4-2, along with figure 3-4 and assemble unloading valve assembly (9) as follows:

(1) Install check ball (28), ball centering pin (27), unloading spring (26) and adjusting screw (25) in valve body (30) cavity. Turn adjusting screw into valve body until one to two threads are left protruding from the body. Final adjustment of screw will be made later.

(2) If pipe plugs (24) were removed, apply pipe sealant to plug threads and install pipe plugs in valve body (30).

(3) Push modular ring (23) and "u" cup (22) into valve body (30) cavity. Coat actuator (21) with Parker O-Lube, or equivalent, and install actuator through ring and "u" cup. Install gasket (20) and actuator plug (19). Torque plug between 40 and 50 foot-pounds.

(4) Install poppet (18), relief spring (17) and adjusting screw (16) in valve body (30). Turn adjusting

screw into valve body until one to two threads are left protruding from the body.

(5) If high pressure valve seat (14) and gasket (15) were removed, place gasket on seat and install seat in valve body (30) cavity. Install seat with Duff-Norton assembly tool number TX-7416-A-B. Make sure the tool engages all four slots in seat or breakage may occur. Torque seat between 15 and 20 foot-pounds.

(6) Install check ball (13), check spring (12), spring guide (11) and female adaptor (10). Torque adaptor between 15 and 20 foot-pounds.

(7) Install unloading valve in test fixture. Adjust high pressure relief valve by turning high pressure adjusting screw (16) until valve relieves at 10,500 PSI. Perform a pressure check to assure sealing of index nos. 10, 13, 15, 20 and 22 at 10,000 PSI.

NOTE:

Leakage at index nos. 13, 15 or 22 (all potential internal leakage points) can not be corrected by indiscriminate jamming of adjusting screw (16). This may damage the relief valve seat. If an internal leak is present as noted during the pressure check, perform a step-by-step inspection and take proper corrective action.

(8) Adjust low pressure adjusting screw (25) to unload the flow at 450 PSI. A continuous flow of two gpm is required to achieve the correct calibration, i.e. unloading this flow at 450 PSI.

d. Refer to figure 4-2 to complete X-7461-A pump and cover assembly. If pipe plugs (67) were removed, install pipe plugs in high pressure plate (65). Attach three high pressure pump assemblies (64) to high pressure plate (65) with cap screws (63).

e. Attach high pressure plate (65) to reservoir cover (66) with four cap screws (61) and lock washers (62).

f. Attach low pressure pump assembly (40) to high pressure pump assemblies (64) with six cap screws (39).

g. Attach filter assembly (33) to low pressure pump assembly with cap screws (32).

h. Install "o" ring (31) in unloading valve assembly (9) groove and attach unloading valve assembly to reservoir cover (66) with cap screws (8).

i. Install return pipe (7), tube fittings (3, 4, 5 and 6) and fluid line tubing (1 and 2).

j. Place the X-7461-A pump and cover assembly in a test stand and check for:

- (1) 26 amp. max. at 115 volt and 10,000 PSI
- (2) 56 in.³/min. at 9500 PSI
- (3) Unusual noise
- (4) All fittings and connections leak tight

NOTE:

To complete assembly, refer to figure 4-1.

k. Model HEP-560 and HUP-560 Pumps Only. Install

gasket (20) and attach electric motor (1) or universal motor (35) to pump and cover assembly (31) with cap screws (18) and lock washers (19). Insure slotted end of coupling (5) engages pin of drive gear (49, figure 4-2). Torque cap screws (18) to 700 inch-pounds.

k. Model HAP-560 Pumps Only. Install gasket (20) and attach air motor (2) to pump and cover assembly (31) with cap screws (18) and lock washers (19). Insure slotted end of coupling (5) engages pin of drive gear (49, figure 4-2). Torque cap screws (18) to 700 inch-pounds.

k. Model HGP-560 Pumps Only.

(1) Install coupling (11) on engine (6) shaft using woodruff key (10), lock washer (12) and cap screw (13). Torque cap screw (13) to 200 inch-pounds.

(2) Install oil seal (17) in motor adaptor (14). Attach motor adaptor (14) to engine (6) with cap screws (7), lock washers (15) and nuts (16). Torque nuts (16) to 700 inch-pounds.

(3) Install gasket (20) and attach motor adaptor (14) to pump and cover assembly (31) with cap screws (18) and lockwashers (19). Insure slotted end of coupling (11) engages pin of drive gear (49, figure 4-2). Torque cap screws (18) to 700 inch-pounds.

l. If decals (25, 32 and 33) and/or nameplate (27) were removed, install new decals and/or nameplate. Attach nameplate with rivets (26).

m. Assemble "o" rings (69, figure 4-2) and back-up rings (69a, figure 4-2) on connector (68, figure 4-2). Install connector and plug (29, figure 4-2) in reservoir cover (66, figure 4-2).

n. Place gasket (22) on reservoir (28) and secure pump and cover assembly (31), with attached parts, to reservoir (28) with cap screws (21).

o. Attach valve or manifold to reservoir cover (see figure 3-2) with four cap screws. Torque screws 15-20 foot-pounds.

p. Install pipe plug (30) and vent plug (29).

q. Test the pump per paragraph 3-7.

3-7 Assembly Tests

Test the assembled power pump as follows:

a. Attach manifold or valve assembly to reservoir cover (see figure 3-2) with four cap screws. Torque screws between 15 and 20 foot-pounds.

b. Fill reservoir with oil, connect hose and flow meter and operate pump to run oil through flowmeter. Check for flow at 9500 PSI. The flow shall be as follows:

HEP-560 — 56 in.³/min.

HAP-560 — 45 in.³/min. at 100 PSI air supply

HGP-560 — 50 in.³/min. at full throttle

HUP-560 — 33 in.³/min.

c. Run pump at no pressure for one minute to run in gear system. Adjust test stand load to 200 psi and check flow rate (motor RPM of 3450 required). Flow of less than 1.8 GPM indicates defective parts or incorrect assembly.

SECTION IV

ILLUSTRATED PARTS LIST

4-1 General

This section contains exploded view illustrations of the 560 Series Pump.

Figure 4-1 illustrates the complete HEP-560, HAP-560, HUP-560 and HGP-560 Pumps.

Figure 4-2 illustrates the X-7461-A pump and cover

assembly which is a major component of all pumps.

The number adjacent to each part on the illustration is the index number. Keyed to this index number is the part name, part number and quantity required.

When ordering parts please specify part name, part number, quantity desired and model number of pump.

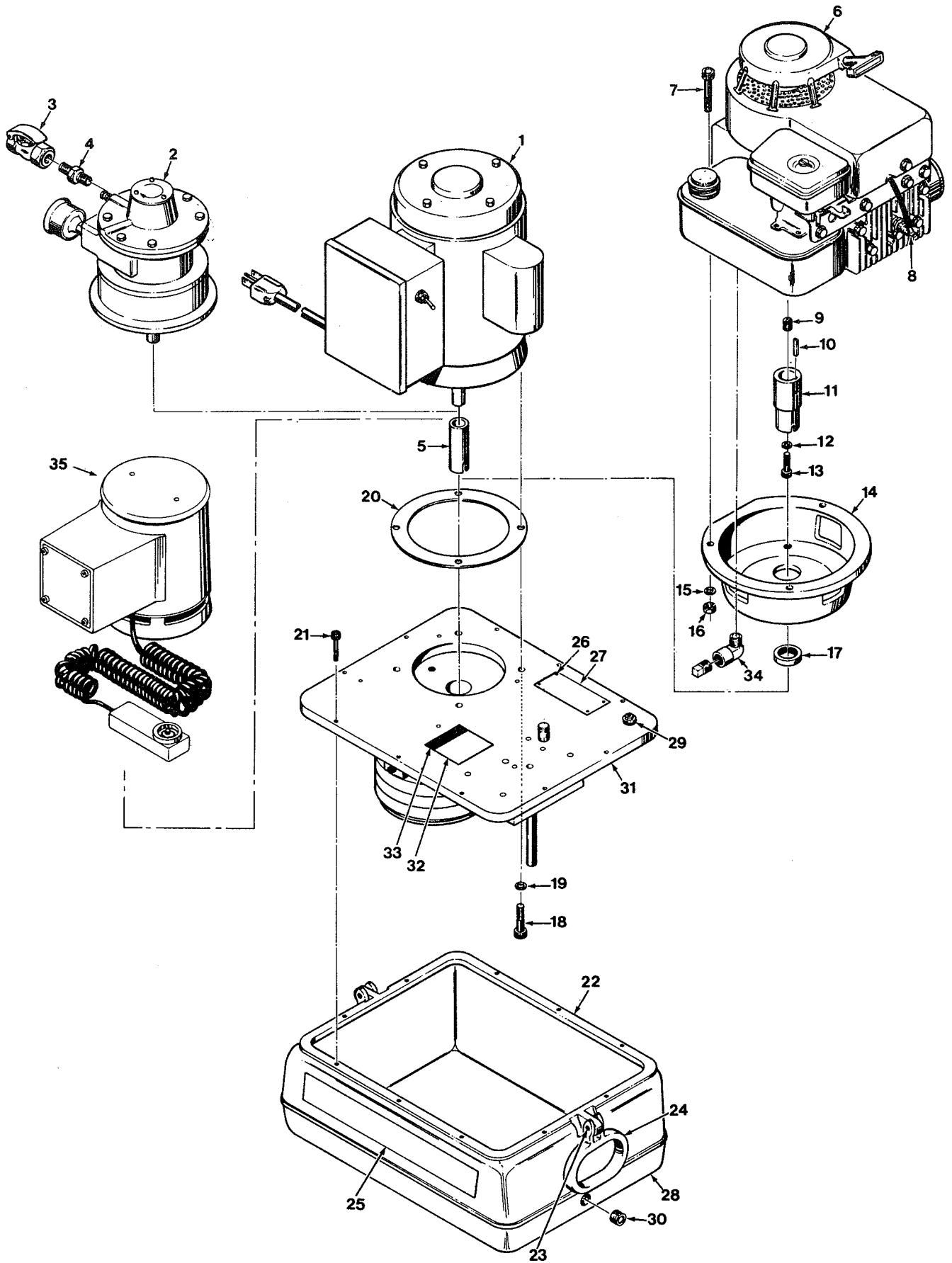


FIGURE 4-1. MODEL 560 SERIES POWER PUMP

PARTS LIST FOR 560 SERIES PUMPS

NOTE: Index nos. 1 and 5 are used with electric motor driven pumps. Index nos. 2, 3, 4 and 5 are used with air motor driven pumps. Index nos. 5 thru 17 and 34 are used with gasoline driven pumps. The remaining index nos. are used on all pumps.

FIG. 4-1
INDEX
NO.

INDEX NO.	PART NAME	PART NO.	QUANTITY REQUIRED
1	ELECTRIC MOTOR	X-7438	1
2	AIR MOTOR	X-7456	1
3	AIR VALVE	X-7047	1
4	CLOSE NIPPLE	HA-38	1
5	COUPLING	X-7437	1
6	GASOLINE ENGINE	X-7455	1
7	CAP SCREW	S-49-8	3
8	SPARK PLUG GUARD	X-7156	1
9	THREADED INSERT	X-7459	1
10	WOODRUFF KEY	S-23-54	1
11	COUPLING	X-7452	1
12	LOCK WASHER	S-42-9	1
13	CAP SCREW	S-49-77	1
14	MOTOR ADAPTOR	X-7457	1
15	LOCK WASHER	S-42-14	3
16	NUT	S-12-17	3
17	OIL SEAL	X-7431	1
18	CAP SCREW	S-49-17	4
19	LOCK WASHER	S-42-21	4
20	GASKET	X-7439	1
21	CAP SCREW	H-2983	12
22	GASKET	X-7443	1
23	HANDLE PIN	S-50-5	2
24	HANDLE	X-31	2
25	DECAL	X-7571	2
26	RIVET, NAMEPLATE	H-2861-P	4
27	NAMEPLATE	X-7453	1
28	RESERVOIR	X-7444	1
29	PLUG, RESERVOIR VENT	X-7445	1
30	PIPE PLUG, 1/2 INCH	H-6269	1
31	PUMP AND COVER ASSEMBLY (see figure 4-2 for details)	X-7461-A	1
32	DECAL	X-7576	1
33	TEMPERATURE ALERT DECAL	X-7577	1
34	PIPE ELBOW	HA-30	1
35	UNIVERSAL MOTOR	X-7584	1

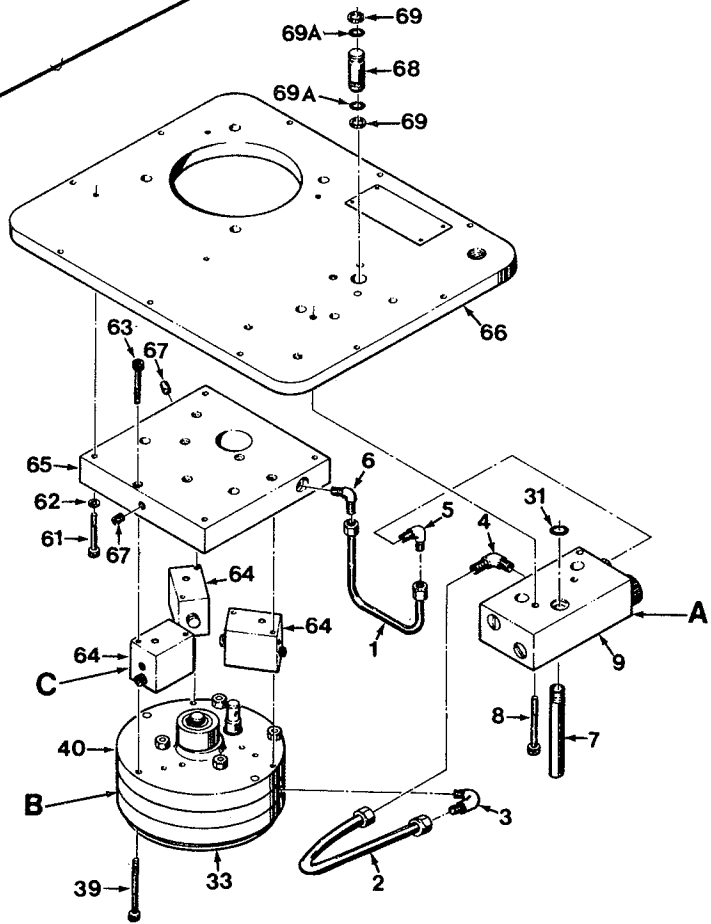
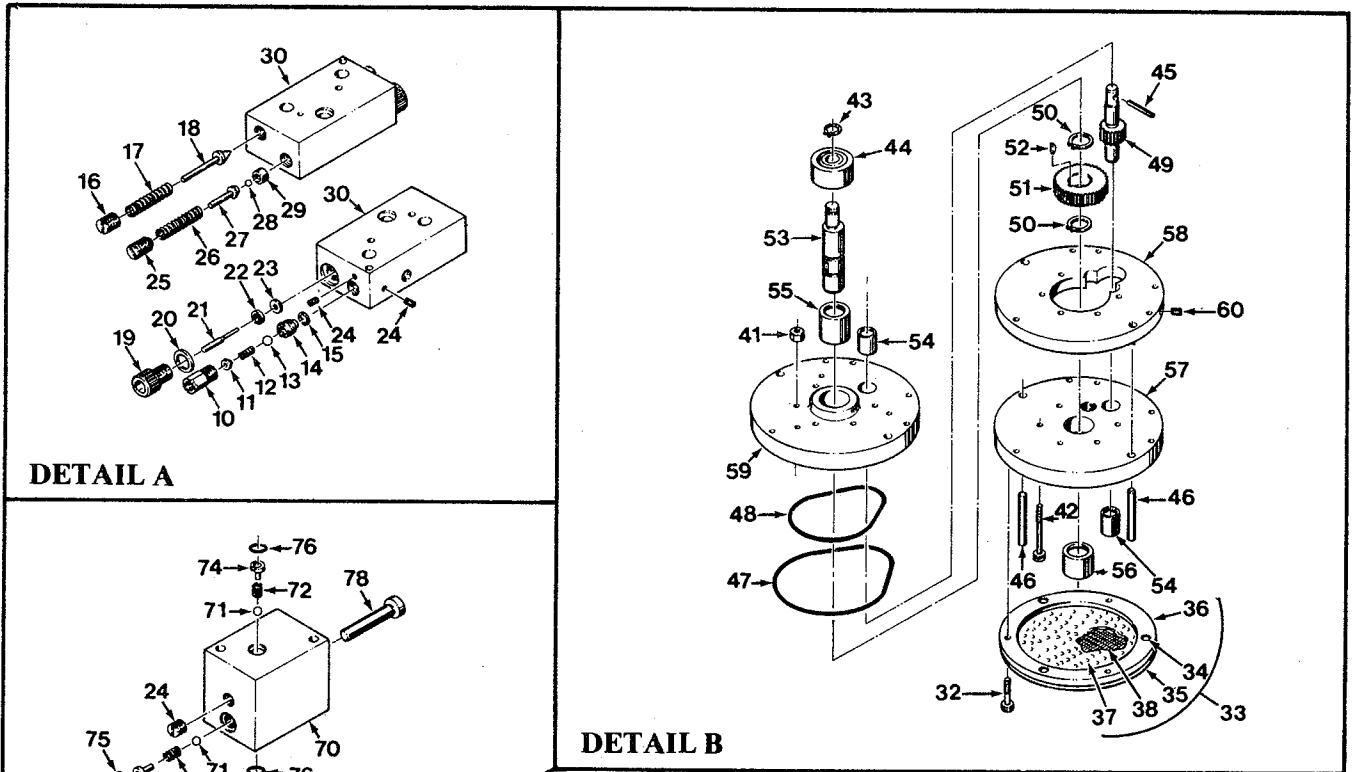


FIGURE 4-2. X-7461-A PUMP AND COVER ASSEMBLY

PARTS LIST FOR X-7461-A PUMP AND COVER ASSEMBLY

FIG. 4-2
INDEX
NO.

INDEX NO.	PART NAME	PART NO.	QUANTITY REQUIRED
1	FLUID LINE TUBING, HIGH PRESSURE	X-7441	1
2	FLUID LINE TUBING, LOW PRESSURE	X-7442	1
3	TUBE FITTING, 3/8 INCH TUBE	X-7446	1
4	TUBE FITTING, 3/8 INCH TUBE	X-7428	1
5	TUBE FITTING, 1/4 INCH TUBE	X-7447	1
6	TUBE FITTING, 1/4 INCH TUBE	X-7429	1
7	RETURN PIPE	X-7435	1
8	CAP SCREW	H-2212	3
9	UNLOADING VALVE ASSEMBLY (Consists of index nos. 10 through 30.)	X-7416-A	1
10	FEMALE ADAPTOR	X-7432	1
11***	SPRING GUIDE	X-7430	1
12***	CHECK SPRING	X-6068	1
13***	CHECK BALL	X-3501	1
14***	HIGH PRESSURE VALVE SEAT	X-7417	1
15***	GASKET, COPPER	X-7415-2	1
16	ADJUSTING SCREW, HIGH PRESSURE	X-7484	1
17***	RELIEF SPRING, HIGH PRESSURE	X-7419	1
18***	POPPET, HIGH PRESSURE RELIEF	X-7418	1
19	ACTUATOR PLUG	X-7420	1
20***	GASKET	X-7415-3	1
21***	ACTUATOR	X-7421	1
22***	"U" CUP	X-7011-8	1
23***	MODULAR RING	X-7423	1
24	PIPE PLUG, 1/16 INCH	H-6265	5
25	ADJUSTING SCREW, LOW PRESSURE	X-7427	1
26***	UNLOADING SPRING	X-7426	1
27	BALL CENTERING PIN, LOW PRESSURE	X-7425	1
28***	CHECK BALL, 1/4 INCH	N-382	1
29	BALL SEAT, LOW PRESSURE	X-7424	1
30	VALVE BODY, UNLOADING RELIEF	X-7416	1
31***	"O" RING	X-6477-55	1
32	CAP SCREW	H-2942-P	3
33	FILTER ASSEMBLY (Consists of index nos. 34 through 38.)	X-7448-A	1
34	RIVET	H-4554	3
35	FILTER SCREEN RETAINER	X-7451	1
36	FILTER DISC	X-7448	1
37	FILTER SCREEN PLATE	X-7450	1
38	FILTER SCREEN	X-7449	1
39	CAP SCREW	H-2213	6
40	LOW PRESSURE PUMP ASSEMBLY (Consists of index nos. 41 through 60)	X-7400-A	1
41	NUT	H-3862	4
42	CAP SCREW	H-2213	4
43*	RETAINING RING	H-5524	1
44*	BEARING, ECCENTRIC	X-7409	1
45*	PIN	S-50-72	1
46	DOWEL PIN	S-51-16	2
47*	"O" RING	X-6477-54	1
48*	"O" RING	X-6477-56	1
49	DRIVE GEAR	X-7406	1
50*	RETAINING RING	H-5550	2
51	GEAR	X-7407	1
52*	WOODRUFF KEY	H-4357	1

PARTS LIST FOR X-7461-A PUMP AND COVER ASSEMBLY (continued)

**FIG. 4-2
INDEX
NO.**

INDEX NO.	PART NAME	PART NO.	QUANTITY REQUIRED
53	HIGH PRESSURE SHAFT	X-7408	1
54*	BEARING, LOW PRESSURE DRIVE	X-7403-1	2
55*	BEARING, LOW PRESSURE TOP PLATE	X-7403-4	1
56*	BEARING, LOW PRESSURE BOTTOM PLATE	X-7403-2	1
57	BOTTOM PLATE, LOW PRESSURE	X-7400	1
58	MIDDLE PLATE, LOW PRESSURE	X-7401	1
59	TOP PLATE, LOW PRESSURE	X-7402	1
60	PIPE PLUG, 1/16 INCH	H-6265	1
61	CAP SCREW	S-49-3	4
62	LOCK WASHER	S-42-9	4
63	CAP SCREW	H-2216	6
64	HIGH PRESSURE PUMP ASSEMBLY (Consists of index nos. 24 and 70 through 78)	X-7410-A	3
65	HIGH PRESSURE PLATE	X-7436	1
66	RESERVOIR COVER	X-7440	1
67	PIPE PLUG, 1/16 INCH	H-6265	2
68	CONNECTOR	X-7433	1
69	"O" RING	X-6477-57	2
69a	BACK-UP RING	X-7434	2
70	PISTON BLOCK	X-7410	3
71**	CHECK BALL	X-7083	6
72**	VALVE SPRING	X-7422	6
73**	INLET SPACER	X-7412	3
74**	OUTLET SPACER	X-7413	3
75**	COPPER GASKET	X-7415-1	3
76**	"O" RING	X-6477-39	6
77**	CAP SCREW	H-2214	3
78	PISTON	X-7411	3

REPAIR PART KITS FOR PUMP SUB-ASSEMBLIES

* REPAIR KIT FOR L.P. PUMP ASSY. (includes parts indicated)	X-8008
** REPAIR KIT FOR H.P. PUMP ASSY. (includes parts indicated)	X-8009
*** REPAIR KIT FOR UNLOADING VALVE (includes parts indicated)	X-8010

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