Parts Manual
45-8190
PL30-1242
04/21/2011

DOTCO®

12-42 Series
Right Angle Sanders



12	X	4	2	XX	-	80

Product Classification
12 = Ergo Housing

Trottle Type
L = Locking Lever
S = Locking Lever

Motor Size
4 = 1.7 hp

Handle Style
2 = Right Angle

Speed Options (RPM)
Side Exhaust

02 = 2,500	**06 =** 6,000
03 = 3,400	**07 =** 7,200
04 = 4,500	**09 =** 8,600

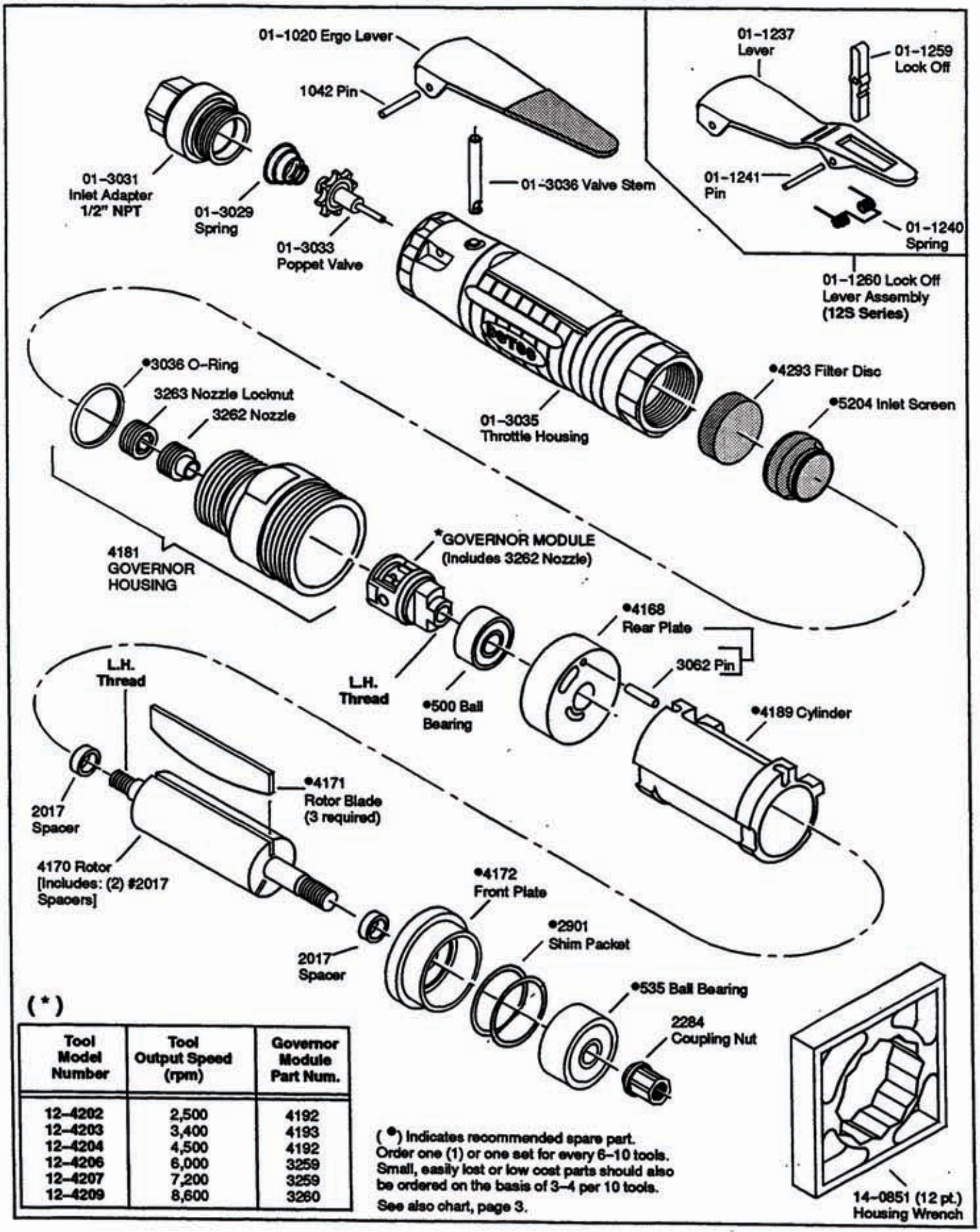
Termination Code
80 = 5/8-11 External Thread Spindle

For additional product information visit our website at http://www.apextoolgroup.com

DOTCO®

Models 12–42 Series Governed Sanders

Throttle Housing, Governor & Motor Components



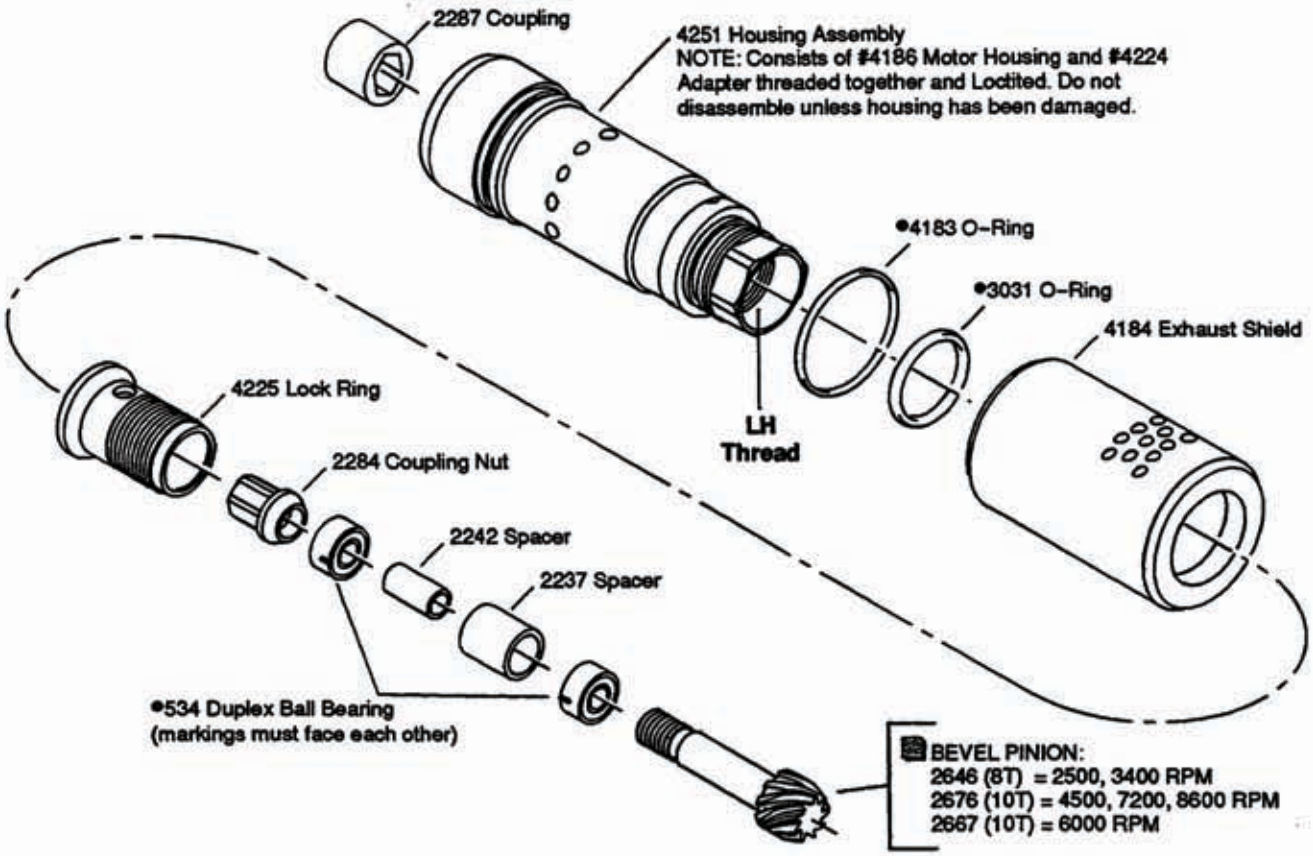
(*)

Tool Model Number	Tool Output Speed (rpm)	Governor Module Part Num.
12–4202	2,500	4192
12–4203	3,400	4193
12–4204	4,500	4192
12–4206	6,000	3259
12–4207	7,200	3259
12–4209	8,600	3260

(•) Indicates recommended spare part. Order one (1) or one set for every 6–10 tools. Small, easily lost or low cost parts should also be ordered on the basis of 3–4 per 10 tools.

See also chart, page 3.

DOTCO®
Models 12–42 Series Governed Sanders
Motor Housing & Spindle Components



(•) Indicates recommended spare part. Order one (1) or one set for every 6–10 tools. Small, easily lost or low cost parts should also be ordered on the basis of 3–4 per 10 tools.
See also chart (below).

(▣) NOTE: ALWAYS replace Bevel Gear and Bevel Pinion *IN PAIRS* since both should wear equally.

RECOMMENDED SPARE PARTS LIST

These parts are suggested as a recommended inventory of spare parts. Where parts are small, low cost, or easily lost, then we recommend stocking 3 to 4 for every 10 tools. Other larger, lower wear or more expensive parts should be maintained as one (or one set) for every six to ten tools.

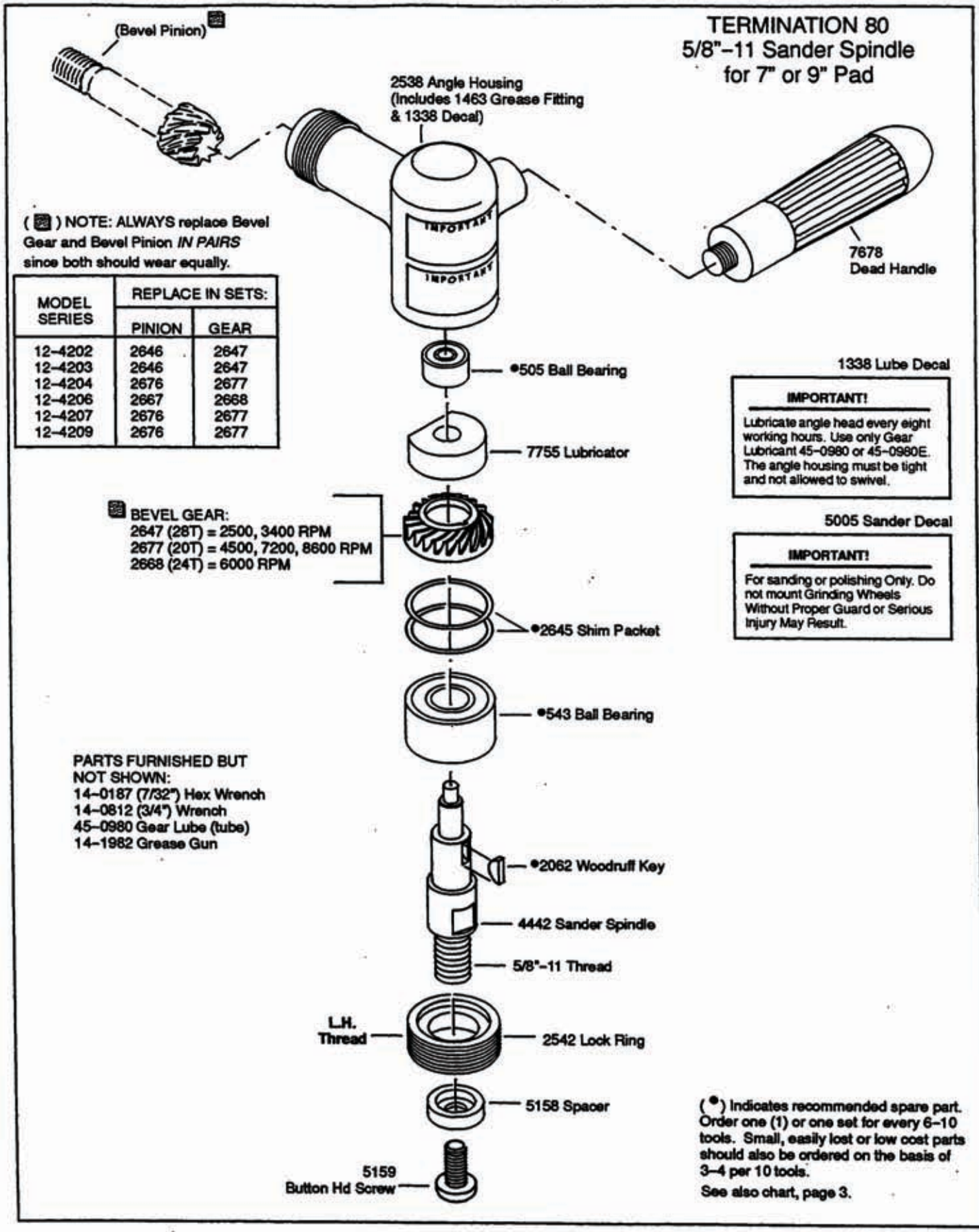
Part Number	Description	Qty Per Tool	Recommended Spare Pts	
			Per Tool	Per 10 Tools
500	Ball Bearing	1	1	2
505	Ball Bearing	1	1	2
534	Duplex Ball Bearing	1	1	2
535	Ball Bearing	1	1	2
543	Ball Bearing	1	1	2
2062	Woodruff Key	1	2–3	3–4
2645	Shim Packet	1	1	2
2901	Shim Packet	1	1	2
3031	O–Ring	1	2–3	3–4

Part Number	Description	Qty Per Tool	Recommended Spare Pts	
			Per Tool	Per 10 Tools
3036	O–Ring	1	2–3	3–4
4168	Rear Plate	1	0	2
4171	Rotor Blade	3	3	15
4172	Front Plate	1	0	2
4183	O–Ring	1	2–3	3–4
4189	Cylinder	1	0	2
4293	Filter Disc	1	1	2
5204	Inlet Screen	1	1	2

DOTCO®

Models 12–42 Governed Sanders

Angle Head & Components



( ) NOTE: ALWAYS replace Bevel Gear and Bevel Pinion *IN PAIRS* since both should wear equally.

MODEL SERIES	REPLACE IN SETS:	
	PINION	GEAR
12–4202	2646	2647
12–4203	2646	2647
12–4204	2676	2677
12–4206	2667	2668
12–4207	2676	2677
12–4209	2676	2677

1338 Lube Decal

IMPORTANT!

Lubricate angle head every eight working hours. Use only Gear Lubricant 45–0980 or 45–0980E. The angle housing must be tight and not allowed to swivel.

5005 Sander Decal

IMPORTANT!

For sanding or polishing Only. Do not mount Grinding Wheels Without Proper Guard or Serious Injury May Result.

PARTS FURNISHED BUT NOT SHOWN:
14–0187 (7/32") Hex Wrench
14–0812 (3/4") Wrench
45–0980 Gear Lube (tube)
14–1982 Grease Gun

(•) Indicates recommended spare part. Order one (1) or one set for every 6–10 tools. Small, easily lost or low cost parts should also be ordered on the basis of 3–4 per 10 tools.

See also chart, page 3.

INSTALLATION

For best performance, air pressure of 90 pounds per square inch is recommended. Piping, fittings and hose should be adequate to maintain this pressure at the tool while the tool is in operation. A regulator such as COOPER POWER TOOL'S #R04–G should be used. Hose should be blown out before attaching tool to remove foreign matter which could damage precision internal parts.

LUBRICATION

The motor must be lubricated and free of moisture. Use COOPER'S Filter #F04–M and Lubricator #L04–EP, or equivalent, for complete lubrication of the tool. We recommend a high grade SAE #5 spindle oil such as DOTCO Lubricating Oil #45–0918. Two or three drops of oil per minute is sufficient.

The angle head gears in this tool must be lubricated every eight hours of operation with a high quality, high speed gear grease. The use Cooper's #45–0980 grease is recommended. A Grease Gun, part #45–0982, is furnished with each tool. Insert the nozzle into the flush–type lube fitting in the side of the angle head and pump four or five times.

LOSS OF POWER

It is seldom necessary to disassemble this tool to correct for loss of power. First, check air line pressure regulator, then check if tool throttle is opening fully. Check the size of hoses and fittings to be certain they are not causing air restrictions. Make certain the hose and fittings are not clogged with rust, dirt and scale.

SERVICE INSTRUCTIONS

The parts of this tool are small and require careful handling. We recommend the tool be returned to the factory for repair. However, if the tool is to be repaired in the field, carefully follow instructions. DO NOT squeeze tool or parts in vise except as specified in these instructions. Bearings are the shielded type. Care must be taken in their assembly and disassembly. Push only on the inner race of the bearings except where specified. NOTE: Bearings are lubricated by the bearing manufacturer for the life of the bearings. Do not clean with a solvent.

DISASSEMBLY INSTRUCTIONS

To Disassemble Complete Tool:

1. Place the special 12—point socket wrench, *part #14–0851*, horizontally in a vise and insert the tool's housing vertically into the wrench. Loosen and unscrew the Angle Head from the tool. NOTE: Left Hand Thread.

To Remove and Disassemble Motor:

2. Grip on hex of Housing Assembly *(part #4251)* between soft vise jaws, throttle end up. Unscrew Governor Housing with throttle attached.

3. Remove tool from vise and slip motor from housing. Unscrew Governor Module from motor. NOTE: Governor module has left hand thread.

4. To disassemble the motor, push Rear Plate *(part #4168)* off end of Rotor *(part #4170)*. Remove Cylinder *(part #4189)*, three Rotor Blades *(part #4171)* and Spacer *(part #2017)*. Hold rotor in soft vise jaws and unscrew Coupling Nut *(part #2284)*. Push Front Plate *(part #4172)* from rotor and remove Spacer *(part #2017)*. Remove both Ball Bearings *(parts #500 & 535)* from front and rear plates. Discard bearings.

Normally, it will not be necessary to remove Nozzle Lock Nut *(part #3263)* or Governor Nozzle *(part #3262)* from Governor Housing unless damaged. If replacement is necessary, refer to *"Speed Adjustment"* section below when reassembling.

To Disassemble Angle Head:

5. Remove Lock Ring *(part #4225)* and pull out the Pinion Assembly. If pinion assembly cannot easily be removed, tap lightly on the pinion end of the housing with a plastic (or non marring) mallet - take care not to hit hard enough to damage threads or to raise burrs on housing end.

6. To disassemble pinion assembly, the pinion's gear may be held between soft vise jaws while unscrewing Coupling Nut *(part #2284)*. Press off the first half of the duplex Ball Bearing *(part #534)* from Pinion. Remove Outer Spacer *(part #2237)* and Inner Spacer *(part #2242)*. Press off second half of duplex bearing.

7. To disassemble the spindle assembly, unscrew Lock Ring *(part #2542)* and pull out spindle assembly. Remove Ball Bearing *(part #505)* and press off Bevel Gear. After Woodruff Key *(part #2062)*, bottom Ball Bearing *(part #543)* can be pressed off spindle.

DISASSEMBLY INSTRUCTIONS

(continued)

To Disassemble Throttle Components:

8. Place the special 12-point socket wrench *(part #14-0851)* horizontally in a vise and insert the tool's Throttle Housing *(part #01-3035)* vertically into the wrench. Unscrew governor housing from throttle housing. To replace Valve Stem *(part #01-3036)* or Poppet Valve *(part #01-3033)*, first remove Inlet Adapter *(part #01-3031)* from rear of the tool. Drive out Pin *(part #1042)* to remove Lever *(part #01-1020 or 01-1260 Lock Off Lever)*.

INSPECTION OF THE GOVERNOR MODULE –

9. Inspect top of governor module. Look for excessive wear around air inlet hole. Also inspect the governor weights. The spring should have uniform coils and be located properly on the arms of the governor weights. *If module replacement is needed, replace with module with the same rated speed. Module kits are made for each different speed. Refer to listing of available SERVICE MODULE KITS, bottom of page 2.*

ASSEMBLY INSTRUCTIONS

ASSEMBLING GOVERNOR MODULE –

1. To reassemble Governor Module, thread onto Rotor *(part #4170)* - NOTE: LH THREAD - and turn module until tight against Ball Bearing *(part #500)*, tightening carefully with wrench (15/16") on flats. When replacing Governor Nozzle *(part #3262)*, make certain nozzle and motor bore of Housing *(part #4219)* are thoroughly clean. Although governor modules are very durable in service, they can be damaged during maintenance unless reasonable care is used. If the tool has been properly repaired, it MUST run at the RPM stamped on the housing with a tolerance of -10% rated speed. Speed stamped on the Governor Module is governed motor speed. Speed stamped on the housing is the rated output speed.

WARNING: The Governor Module is factory sealed and cannot be repaired under any circumstances. User repair of the Governor Module should never be attempted. Replace with a *new* Module of the same rated speed to prevent dangerous over-speeding of the sander.

TO ASSEMBLE COMPLETE SANDER –

To Assemble Motor:
(All parts, except bearings, should be thoroughly cleaned and lightly oiled before assembly.)

2. Check Rotor Blades *(part #4171)* for wear and replace if less than 7/16" (0.437") wide. NOTE: It may save downtime if all ball bearings are replaced whenever the motor is repaired even if no wear is evident. To correct for bearing tolerances, it is necessary to use shims to maintain correct clearances between the ends of the rotor and the front and rear bearing plates.

3. Front Plate –
Shim Packet *(part #2901)* contains one 0.001" shim and two 0.003" shims. Insert the 0.003" shim in Front Plate *(part #4172)*. Insert Ball Bearing *(part #535)* into Front Plate *(part #4172)*. Place Spacer *(part #2017)* onto Rotor *(part #4170)*. Press bearing and plate onto front of rotor. Press only on the inner race of the bearings. Thread Coupling Nut *(part #2284)* onto Rotor *(part #4170)* tightly.

4. Now, hold rotor in left hand and front plate assembly in right hand. Apply on outward (pulling) pressure and observe the spacing between end of rotor and plate. This should be from flush, not rubbing, to 0.002" maximum. If the rotor rubs the plate, reduce the spacing between the bearing and plate by removing the 0.003" shim entirely, or by substituting a 0.001" shim for the 0.003" shim. However, if there was more than 0.002" spacing between the end of the rotor and plate, then add 0.001" shim between the bearing and bearing plate.

5. Rear Plate –
Slip Spacer *(part #2017)* onto rear of rotor. Press Rear Plate *(part #4168)* onto rotor by pressing on inner race of Ball Bearing *(part #500)*. Observe spacing between end of rotor and rear plate. Shim if necessary. Remove rear plate from rotor and place three Rotor Blades *(part #4171)* into rotor slots. Replace Cylinder *(part #4189)*. *NOTE: BE SURE CYLINDER IS NOT ON BACKWARDS. Air inlet in cylinder must line up with air inlet in rear plate when Pin (part #3062) is engaged in mating slot of cylinder.*

ASSEMBLY INSTRUCTIONS

(continued)

6. Press rear plate/with bearing onto rear of rotor. Replace governor module onto back of rotor per instructions in *"Assembling the Governor Module"* above. NOTE: governor module has a left hand thread.

Replace Coupling *(part #2287)* over Coupling Nut *(part #2284)*.

To Assemble Complete Angle Head Assembly:

NOTE: Do not grease angle head assembly until proper gear mesh has been established. Also, do not assemble Lubricator Disc #7755. Refer to instructions, below.

Make sure all parts are properly cleaned and inspected before beginning assembly.

7. Spindle Assembly:
Press Ball Bearing *(part #543)* against shoulder of Spindle *(part #4442)*, pressing only on inner race of bearing. Insert Woodruff Key *(part #2062)* in slot in spindle. Align keyway of Bevel Gear with key, and press Bevel Gear onto Spindle *(part #4442)* until it seats on inner race of bearing. Complete the spindle assembly by pressing on Ball Bearing *(part #505)* until it seats on spindle's shoulder. Insert this assembly into housing. Thread Lock Ring *(part #2542)* into Angle Housing *(part #2538)* until tight.

8. Bevel Pinion Assembly:
Press one half of the *duplex* Ball Bearing *(part #534)* onto pinion, taking care to keep the small marking (refer to detail on exploded view, page 3) facing the other half of the duplex bearing. Slip inner Spacer *(part #2242)* and outer Spacer *(part #2237)* over pinion. Press second half of duplex bearing onto pinion, being sure to keep the small marking on the bearing ***in line and facing*** the marking on the other bearing half.

Screw on Coupling Nut *(part #2284)*. Install this pinion assembly into the Angle Housing *(part #2538)* – Be certain the teeth of the pinion mesh with the bevel gear by revolving the spindle slowly. Screw on Lock Nut *(part #4225)*.

NOTE: Proper shimming must now be attained, then Lubricator Disc installed and the angle head greased.

Shimming:

9. Due to manufacturing tolerances, it is sometimes necessary to place a thin shim between the outer race of Ball Bearing *(part #543)* and the internal shoulder of Angle Housing *(part #2538)*. There should be a backlash of 0.002" to 0.003" between the bevel pinion and bevel gear. After the angle head's pinion and gear have been assembled and before any grease has been applied to the gears, *slowly rotate the spindle back and forth a few degrees with the fingers. If the gears are in mesh but no backlash can be felt, remove Lock Ring, #2542, from angle housing. Then, remove spindle assembly and position two shims, each 0.001" thick on the outer race of Bearing, #543, using some grease to hold shim on bearing. Reassemble and again follow above procedure. If there is still not enough backlash, add another shim. Shim Packet contains two 0.001" shims and one 0.003" shim.*

Lubricator Disc:

10. When proper shimming is obtained, remove spindle assembly from angle head, remove the rear ball bearing and install Lubricator Disc *(part #7755)*. Lube disc must be filled with lube (Cooper's #45–0890) prior to assembly onto spindle. Reinstall spindle assembly into angle housing aligning flats of disc with pinion gear. Tighten Lock Ring *(part #2542)*.

To Replace Motor in Housing:

11. Insert assembled motor into Housing *(part #4251)*. Screw Governor Housing *(part #4181)* into motor housing, leaving approximately 1/16" gap between governor housing and motor housing.

To Assemble Angle Head Assembly to Housing:

12. Thread Angle Head Assembly into housing — NOTE: Angle Housing has Left Hand Threads. Angle assembly may be positioned with respect to the lever throttle assembly by threading Governor Housing *(part #4181)* a partial turn in or out of Motor Housing *(part #4251)* and then re–tightening angle assembly. *Governor Housing (part #4181) has right hand threads and Angle Housing (part #2538) has Left Hand Threads.*

Sales & Service Centers

Note: All locations may not service all products. Please contact the nearest Sales & Service Center for the appropriate facility to handle your service requirements.

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