80217474
Edition 4
November 2014

Air Nutrunner

QA4

Maintenance Information

Save These Instructions

Ingersoll Rand

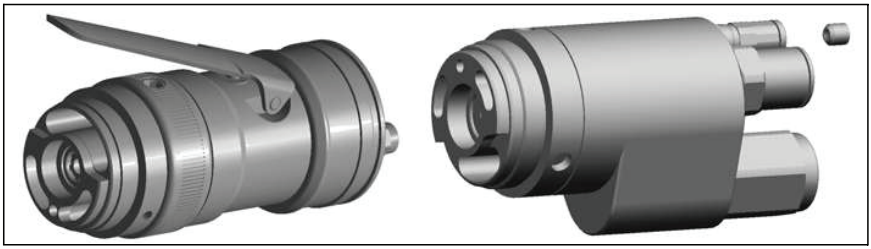
Product Safety Information

WARNING

- Failure to observe the following warnings, and to avoid these potentially hazardous situations, could result in death or serious injury.
- Read and understand this and all other supplied manuals before installing, operating, repairing, maintaining, changing accessories on, or working near this product.
- Always wear eye protection when operating or performing maintenance on this tool. The grade of protection required should be assessed for each use and may include impact-resistant glasses with side shields, goggles, or a full face shield over those glasses.
- Always turn off the air supply, bleed the air pressure and disconnect the air supply hose when not in use, before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool or any accessory.

Note: *When reading the instructions, refer to exploded diagrams in Parts Information Manuals when applicable (see under Related Documentation for form numbers).*

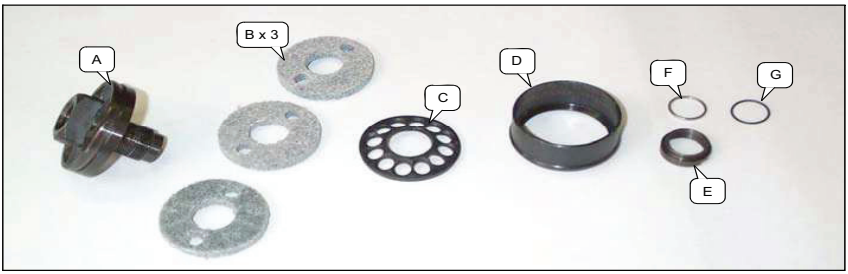
Housing Module



Lever Tool Component Descriptions

	For module:	53453650	53445573	53453890	80164627
Qty	Designation	CCN	CCN	CCN	CCN
1	Screen	53505442	53505442	53505442	53505442
1	Reverse Housing	53445482	53445482	53445482	53445482
2	Screw	53441499	53441499	53441499	53441499
1	Reverse Housing Assembly	53413357	53413357	53413357	53413357
1	Lever Housing Assembly	53430757	53430757	53430757	53430757
1	Exhaust Housing Assembly	53413431	80160971	53413431	80160971

Exhaust Assembly



		For module:	53453890 / 53453650	53445573 / 80164627
Qty	Designation	Callout	CCN	CCN
1	Inlet Bushing	A	53453411	53504841
3	Muffler	B	53505400	53505400
1	Diffuser	C	53505319	53505319
1	Cover	D	53416863	53416863
1	Nut	E	53505285	53505285
1	Washer	F	53505459	53505459
1	O-Ring	G	04362372	04362372

Tooling requirements

Specific tools

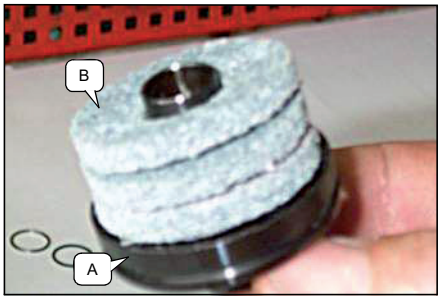
Qty	CCN	Ref. CM	Designation
1	53440301	OM129	Nut Tightening Tool

Standard tools and products

- 2 Screws 6mm
- Calipers
- O-ring Lube

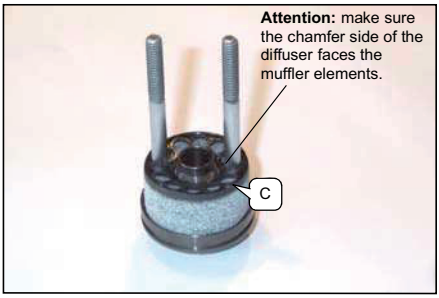
Assembly instructions

Mount the mufflers B on the inlet bushing A.



Align the screws so they are parallel.

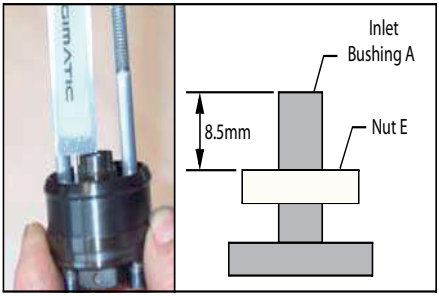
Place the diffuser C on top of the mufflers.



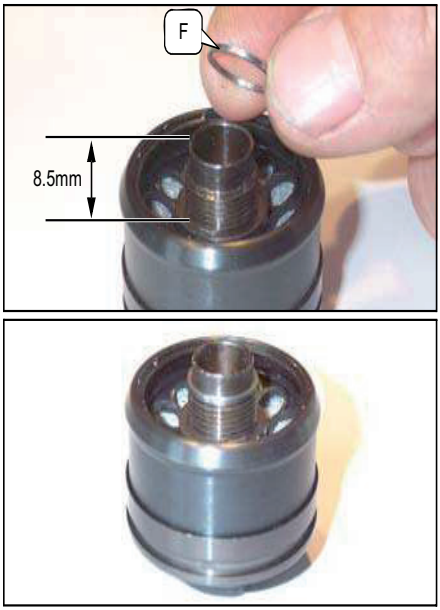
Place cover D over assembly.

Thread nut E onto inlet A thread with the aid of Tool OM129.

Verify that the depth of nut E has been threaded to a minimum depth of 8.5mm.

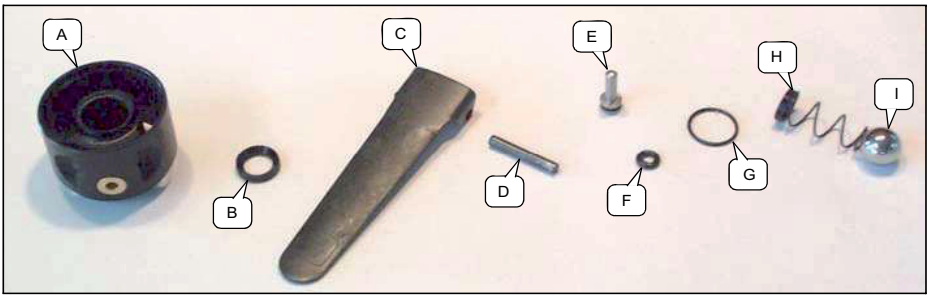


Place washer F over nut E.



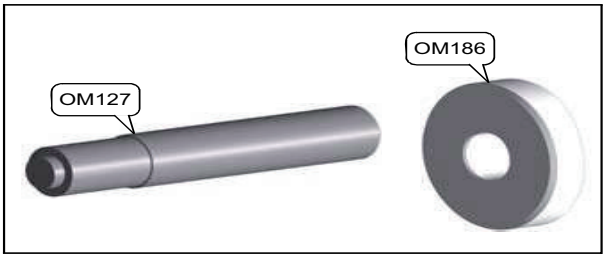
Apply o-ring lube on o-ring G and place on top of washer F.

Lever Housing Assembly



			All Models
Qty	**Designation**	**Callout**	**CCN**
1	Lever Housing	A	53430203
1	Valve Seat	B	53505467
1	Lever	C	53429957
1	Pin	D	53430237
1	Valve	E	53429270
1	O-Ring	F	53415162
1	O-Ring	G	04362372
1	Spring	H	53505343
1	Ball	I	53420170

Tooling Requirements



Specific Tools

Qty	CCN	Ref. CM	Designation
1	53440012	OM127	Valve Seat Assembly Tool
1	53444527	OM186	Pin Assembly Tool

Standard tools and products

- O-ring lube
- Loctite 638 (or equivalent)
- Hammer
- Grease Remover
- Manual Press
- Vice
- Alignment Pins/Punches
- Needle-nose Pliers

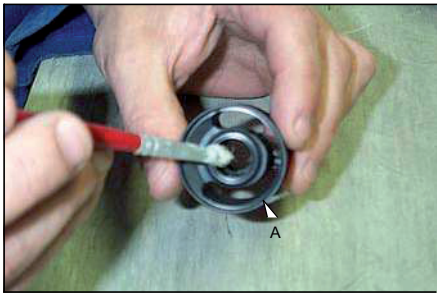
Assembly Instructions

Cleaning

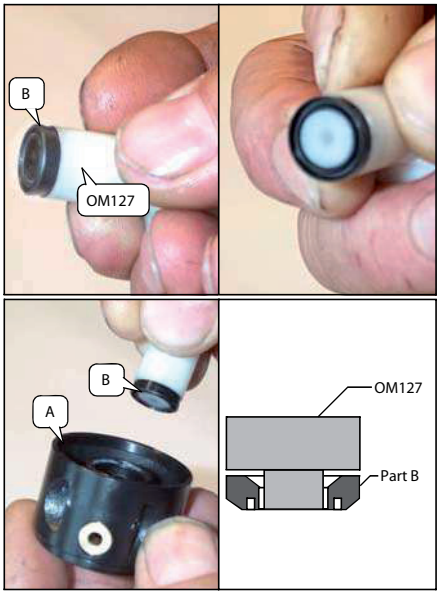
Wash the valve seat with grease remover.

Assembly

Lubricate the valve seat groove in part A with o-ring lube.

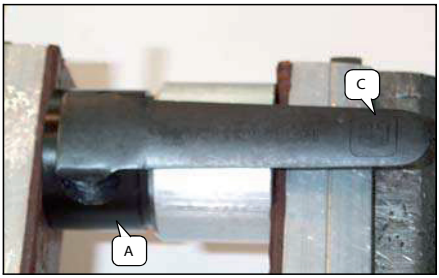


Using OM127, place valve seat B into housing A.

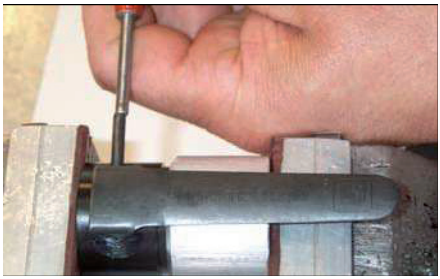


Position the housing on OM186 then tighten in vice.

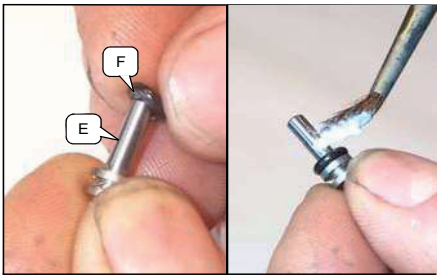
Position the lever C over the housing A.



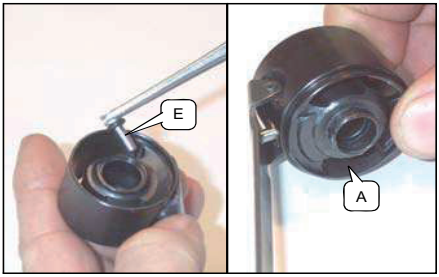
Assemble pin D using a punch and hammer.



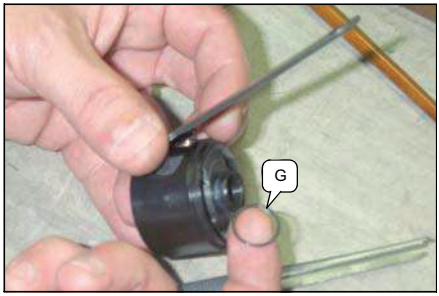
Place o-ring F over valve E and coat with o-ring lube.



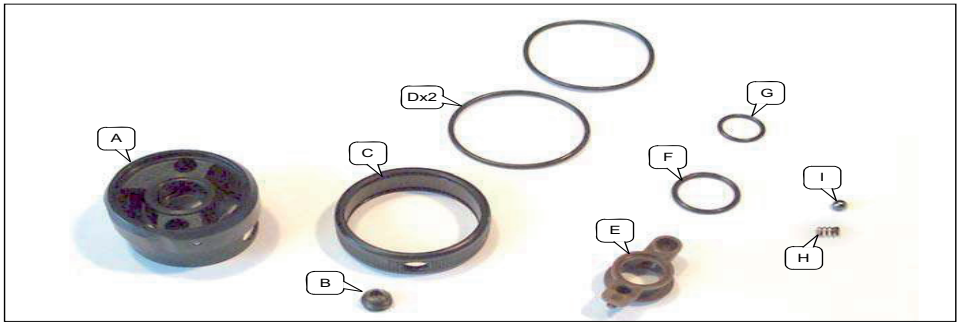
Install the valve E in the housing A using needle-nose pliers.



Coat the o-ring G with o-ring lube. Place o-ring G on the housing A.



Reverse Housing Assembly



			All Models
Qty	**Designation**	**Callout**	**CCN**
1	Reverse Housing	A	53505533
1	Screw	B	53505525
1	Reverse Ring	C	53505475
2	O-ring	D	53506234
1	Reverse Valve	E	53421616
1	O-ring	F	53506184
1	O-ring	G	04375226
1	Spring	H	53431409
1	Ball	I	04360590

Tooling requirements

Standard tools and products

- O-ring lube
- Loctite 542 (or equivalent)
- 4mm Hex Wrench
- Grease Remover

Assembly Instructions

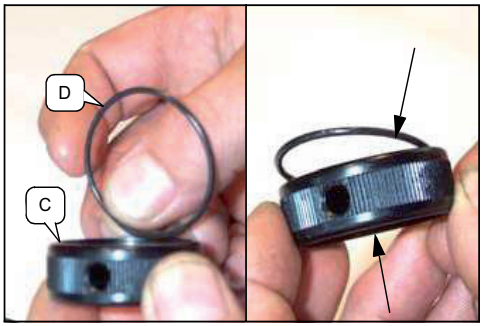
Cleaning

Use grease remover to clean the reverse housing A, screw B, and reverse ring C.

Assembly

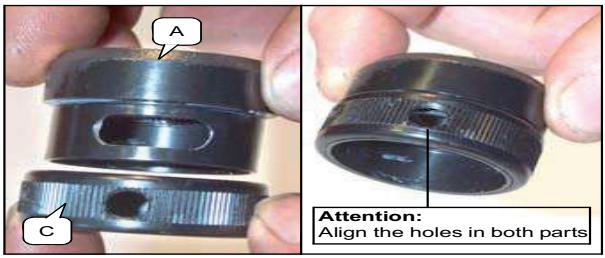
Place both o-rings D in the grooves of reverse ring C.

Reverse Housing Assembly

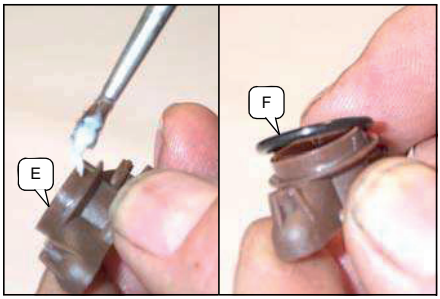


Coat the o-ring D with o-ring lube.

Place the reverse ring C on the reverse housing A.

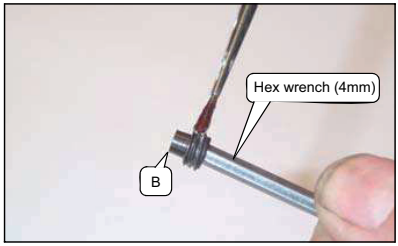


Coat the end of the reverse valve E with o-ring lube and place o-ring F over the end.

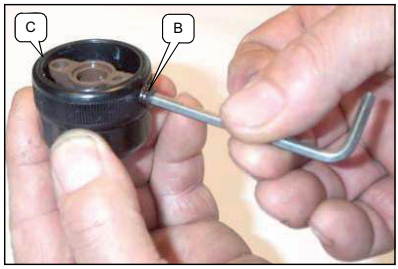


Lubricate the ID step on reverse block A with o-ring lube and assemble reverse valve E in place.

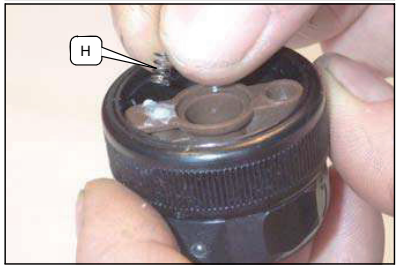
Coat the screw B with Loctite 542.



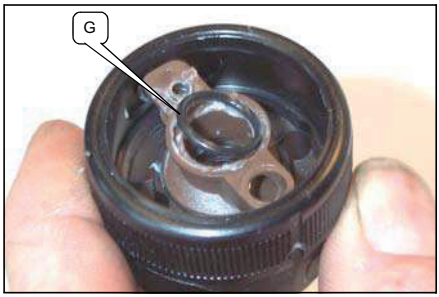
Hand tighten the screw B into reverse ring C (ring should turn freely without binding).



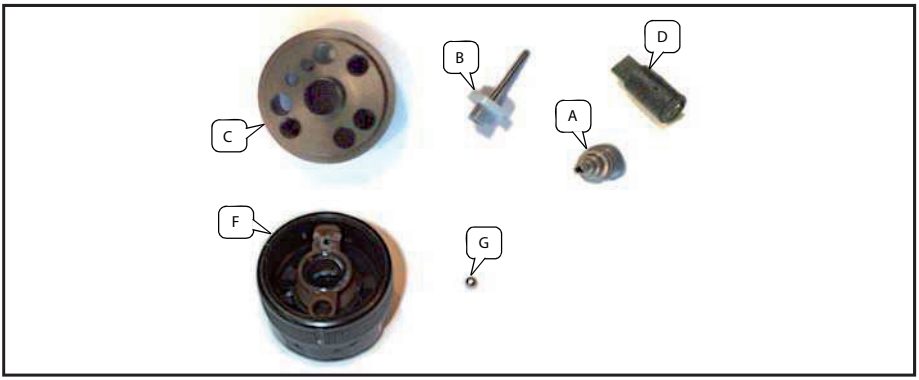
Apply grease in selector spring hole in reverse valve E and assemble spring H.



Use o-ring lube to lubricate the ID step on reverse valve E and put o-ring G in place.



Reverse Block



		For module:	53453650 / 53445573	53453890 / 80164627
Qty	Designation	Callout	CCN	CCN
1	Valve Guide	A	53445466	53445466
1	Shutoff Valve	B	53506119	-
1	Motor Housing Adaptor	C	53504916	53504916
1	Dallas Chip Assembly	D	10569747	10569747
1	Pin	E	-	04362356
1	Reverse Housing Assembly	F	53413357	53413357
1	Ball	G	04360590	04360590

Tooling requirements

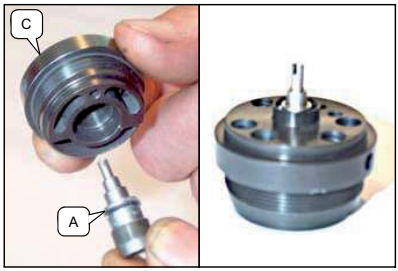
Standard tools and products

- Loctite 638 (or equivalent)
- O-ring lube
- Flathead screwdriver

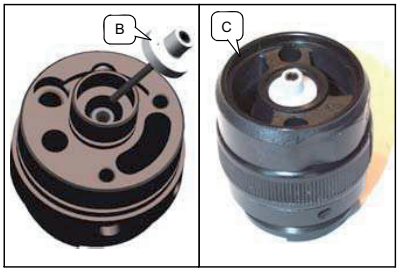
Assembly Instructions

Apply Loctite 638 to the chamfer surface and threads of valve guide A.

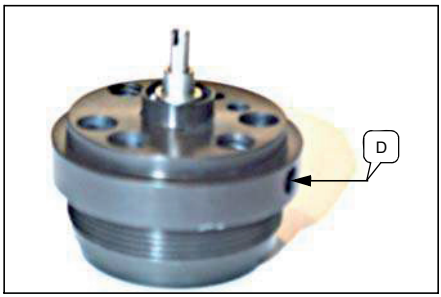
For shutoff tools, thread valve guide A into housing adapter C using a flathead screwdriver.



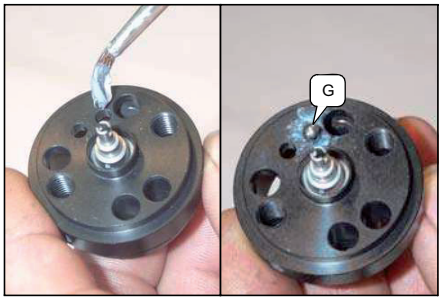
For shutoff tools, place valve B in the housing adapter C. For direct drive tools, apply loctite to the pin and place it in the housing adaptor.



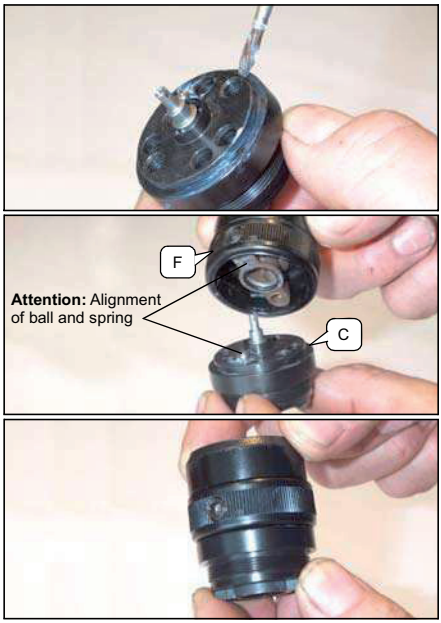
Assemble Dallas Chip D into hole on housing adapter C.



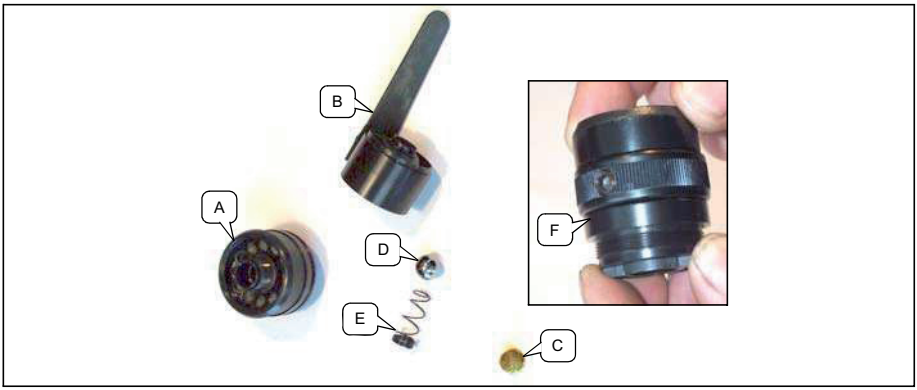
Apply o-ring lube in selector hole on housing adapter C and put ball G in place.



Apply o-ring lube to outside of housing adapter C and assemble to reverse housing assembly F while maintaining proper alignment of ball G and spring.

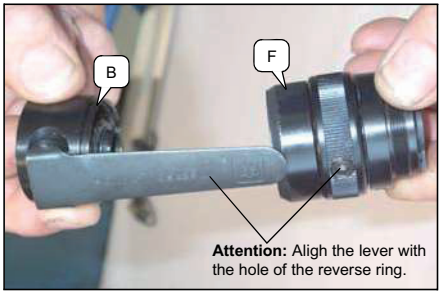


Final Assembly



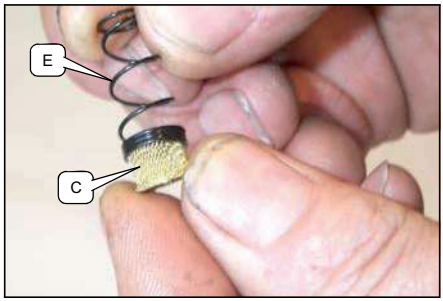
		For module:	53453890 / 53453650	53445573 / 80164627
Qty	**Designation**	**Callout**	**CCN**	**CCN**
1	Exhaust Assembly	A	53413431	80160971
1	Lever Housing Assembly	B	53430757	53430757
1	Screen	C	53505442	53505442
1	Ball	D	53420170	53420170
1	Spring	E	53505343	53505343
1	Reverse Block	F	53505343	53505343
2	Screws	G	53441499	53441499

Assembly Instructions

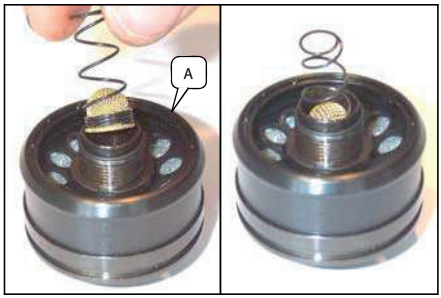


Place the ball D in the lever housing B.

Place the spring E over the screen C.



Place the screen assembly in the exhaust assembly A.

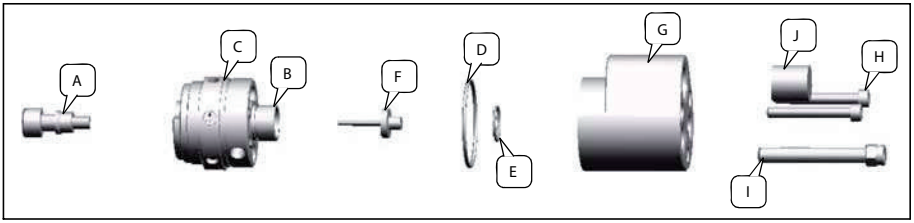


Compress and hold the exhaust assembly to the lever assembly.

Remote Housing Module Component Descriptions

		For module:	53452785	53452785
Qty	**Designation**	**Callout**	**CCN**	**CCN**
1	Valve Guide	A	53445466	53445466
1	Valve Housing	B	53442455	53442455
1	Dallas Chip Assembly	C	10569747	10569747
1	O-Ring	D	53505723	53505723
1	O-Ring	E	04362372	04362372
1	Shutoff Valve	F	53506119	53506119
1	Housing	G	53442489	53442489
2	Screw	H	53487997	53487997
1	Screw	I	53442505	53442505
1	Silencer	J	53453361	53453361
1	Connector Kit	(not shown)	80156771	80156763

Remote Assembly



Tooling requirements

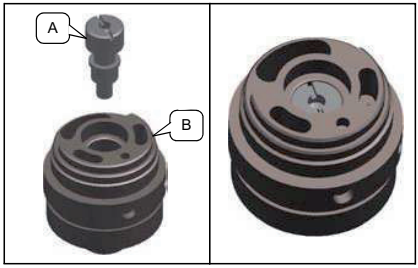
Standard tools and products

• O-ring Lube

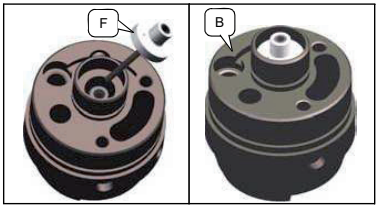
Assembly instructions

Apply Loctite 638 to the chamfer surface and threads of valve guide A.

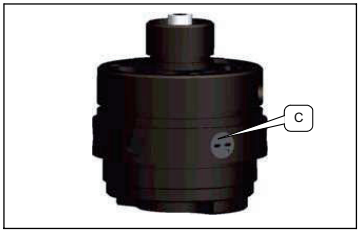
For shutoff tools, thread valve guide A into housing adapter B using a flat-head screwdriver.



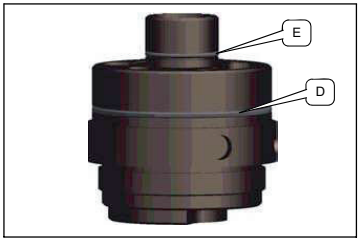
For shutoff tools, place valve F in the housing adapter B. For direct drive tools, apply loctite to the pin and place it in the housing adaptor.



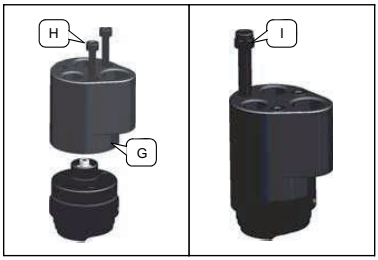
Assemble Dallas Chip C into hole on housing adapter B.



Apply O-ring lube to the two grooves on housing adaptor B. Place O-rings D & E in the grooves.



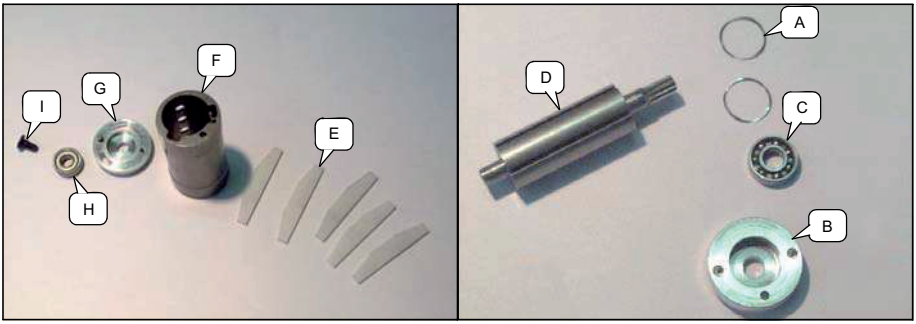
Align housing G to valve housing B with 2 screws H. Tighten screws to 6 Nm. Tighten screw I to 5 Nm maximum.
Note: care must be taken as this screw will break if over torqued.



Place muffler element J in housing primary exhaust hole. Attach proper connector kit tube fittings to housing inlet and exhaust holes.

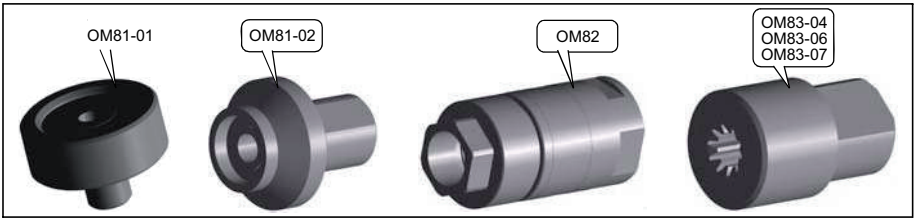
Motor Module

Component Descriptions



		For module:	53414819	53448684	53505095
Qty	**Designation**	**Callout**	**CCN**	**CCN**	**CCN**
2	Wave Washer	A	53522967	53522967	53522967
1	Front Endplate	B	53505020	53505020	53505020
1	Front Bearing (7x17x5)	C	04361705	04361705	04361705
1	Rotor	D	53414850	53448692	53616868
5	Vane	E	53439378	53439378	53439378
1	Cylinder	F	53505004	53505004	53505004
1	Rear Endplate	G	53505038	53505038	53505038
1	Rear Bearing (6x15x5)	H	04363479	04363479	04363479
1	Screw	I	53505582	53505582	53505582

Tooling Requirements



Specific tools

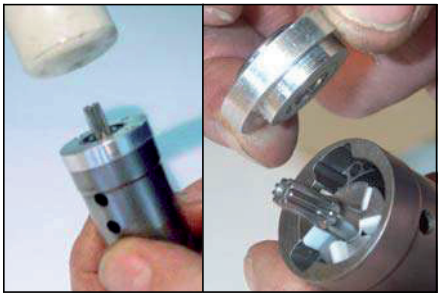
CCN	Ref. CM	Designation
53440699	OM81-01	Motor Assembly Tool
53440723	OM81-02	Motor Press Assembly Tool
53444519	OM82	Motor Adjustment tool
53440731	OM83-04	Rotor Spline Adapter 10
53440814	OM83-06	Rotor Spline Adapter 11
53448981	OM83-07	Rotor Spline Adapter 9

Standard tools and products

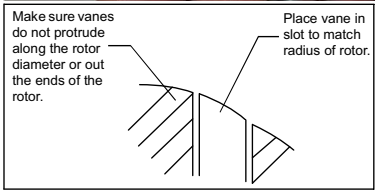
- Manual Arbor Press
- Grease-remover
- Loctite 243 (or equivalent)
- Vice
- 35mm open end wrench
- 2mm Hex Key
- IR 10 air tool oil (or equivalent)
- IR 68 grease
- Heat Gun - for disassembly

Replacement of the vane only

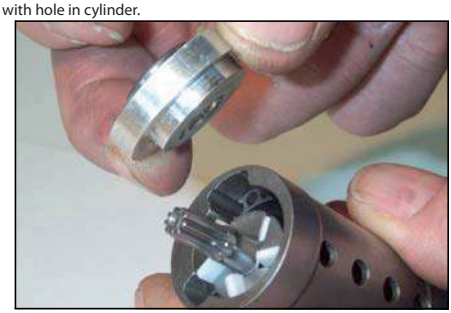
Hold motor firmly in hand, strike mallet on rotor spline to drive rotor and rear endplate out of front endplate. Next remove front endplate and rotor assembly from motor cylinder.



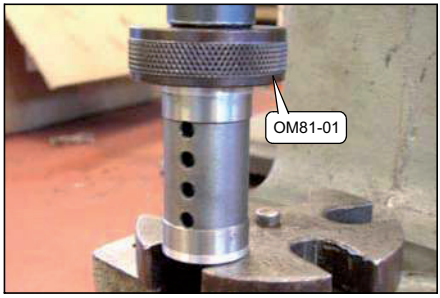
Remove old vanes from rotor and using degreaser Clean all surfaces of rotor and endplate. Oil all surfaces of the new vanes and insert them in the motor.



Mount the rotor & end plate assembly in the cylinder.
Note: Pin in endplate must match up with hole in cylinder.

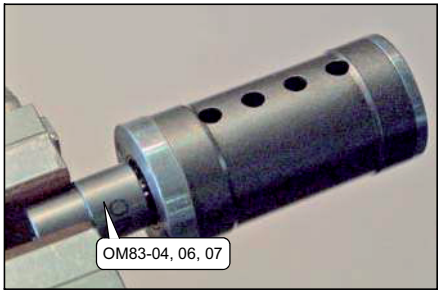


Place OM81-01 on top of motor, then press until bearing C is flush with the endplate B.

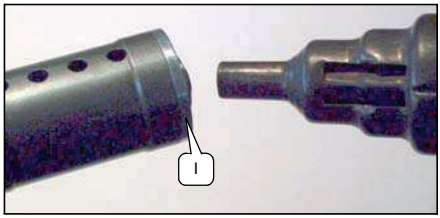


Complete Disassembly of the Motor

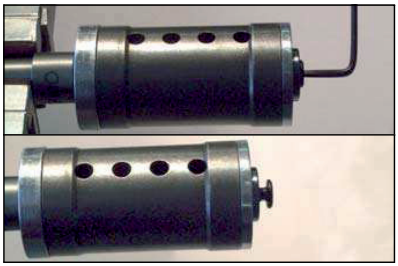
Place the spline adapter (OM83-04, 06, 07 depending on model) over the rotor spline and hold in the vice as pictured.



Heat the screw I in the rear of the motor with a heat gun.



Using 2mm hex key, unscrew rear fastener to allow movement in the endplate.



Lightly tap on rotor spline with plastic mallet to push rotor D out of endplate B. Remove motor parts one at a time.

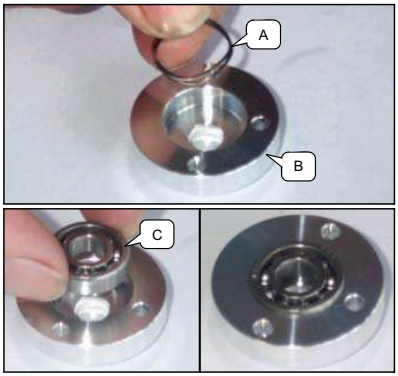
Assembly Instructions

Cleaning

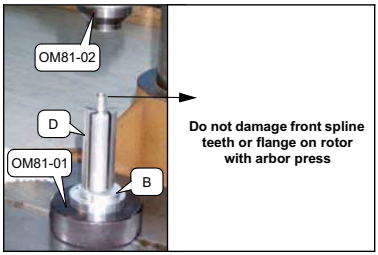
Completely clean rotor and cylinder with a degreasing agent, it may be necessary to use a light brush to clean the rotor and pin with the degreaser.

Assembly

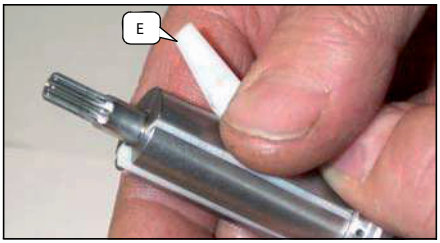
Place two wave washers A in the front endplate counter bore B. Lubricate bearing C with IR 68 grease. Then place bearing in the counter bore.

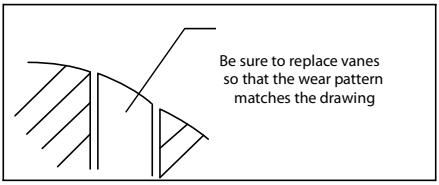


Place the rotor D on the endplate B and place front endplate B into OM81-01. Press the rotor, using OM81-02, in the endplate with the manual press.

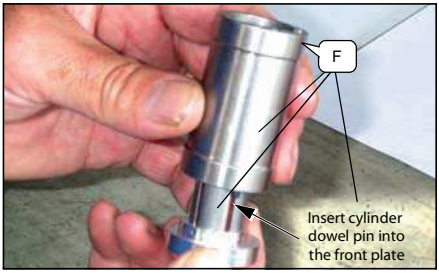


Oil vanes E on all surfaces with IR 10 air tool oil and place them one at a time in the rotor.

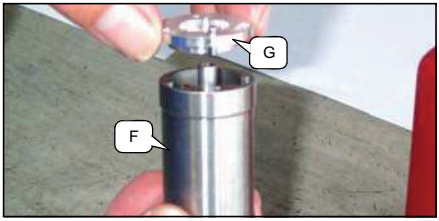


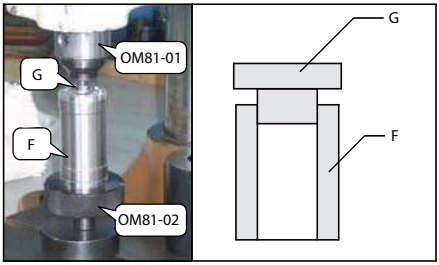


After inserting vanes into rotor, slide cylinder F over the rotor and front endplate.



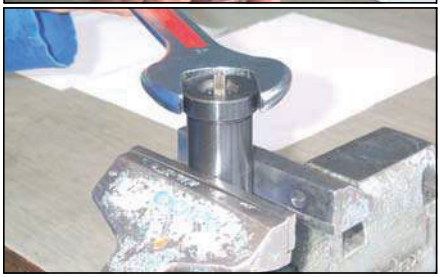
Place OM81-01/02 in the manual arbor press. Put the rear plate G on cylinder F. (Note: Pin in cylinder must be lined up with hole in endplate). Install bearing H onto the rotor using the press and OM81-01/02. Press until entire assembly is tight and will not rotate.





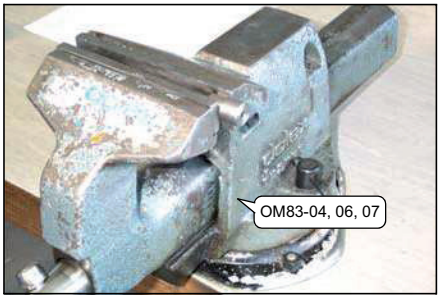
Adjustment of the motor

Place the motor assembly inside OM82. Care must be taken to ensure that pin in the endplate is located in hole in base of fixture. Install back cap on fixture. (Note: Tighten to 40 N-m using a 35mm wrench)

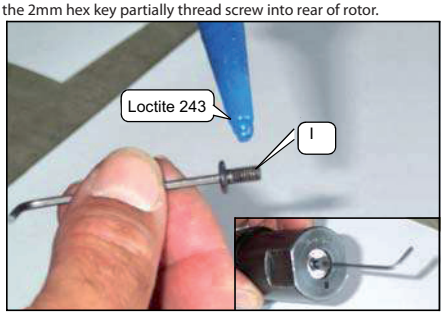


Clean screw I and the screw hole in the back of the rotor with degreaser.

Tighten spline adapter OM83-04, 06, 07 that fits rotor being used directly into the vice jaws.

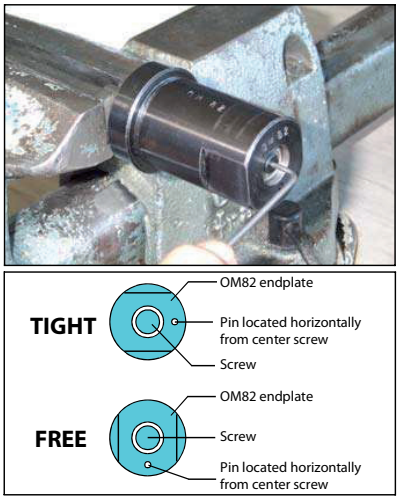


Apply Loctite 243 to screw I and using the 2mm hex key partially thread screw into rear of rotor.



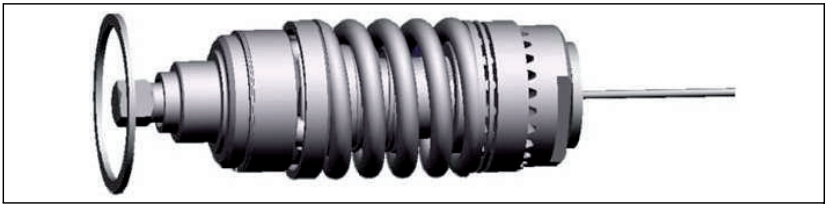
Place the motor spline into the spline adapter (previously tightened into the vice jaws) and slowly tighten screw I.
Tighten screw until assembly rotates freely.

Tighten screw until assembly rotates freely.

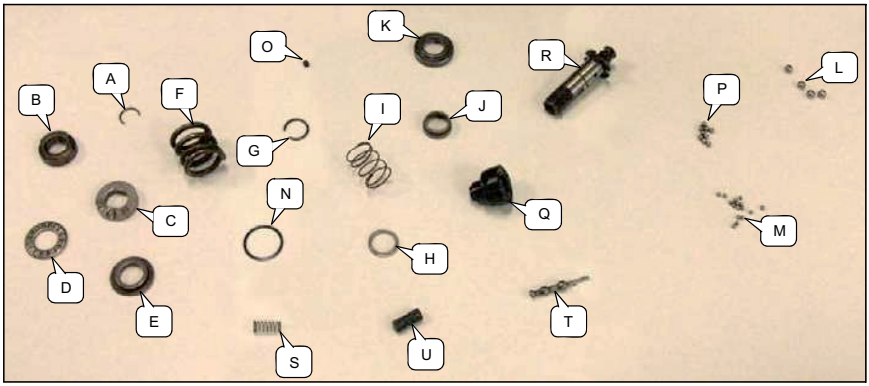


Note: When spacing is correct and motor is rotating freely, motor and OM82 should fall to vertical orientation of pin and center screw. If motor does not come free and screw cannot be tightened further, motor must be completely disassembled
Note: After motor is clamped in OM82 tooling, the rotor may already spin freely. If this occurs, follow the same assembly procedure. After the screw I bottoms out against the back bearing H, continue tightening about 10 degrees. Rotor should still spin freely. This is to ensure proper rotor spacing during normal tool operation.

Clutch



Component Descriptions



			53446951	80158942
Qty	**Designation**	**Callout**	**CCN**	**CCN**
1	Retaining Clip	A	04053682	04053682
1	Adjusting Nut	B	04119780	04119780
1	Adjusting Nut Lock	C	10547982	10547982
1	Thrust Bearing	D	04098430	04098430
1	Thrust Bearing Support	E	04148367	04148367
1	Clutch Spring	F	04130720	04150306
1	Retaining Ring	G	04151700	04151700
1	Clutch Guide	H	04150363	04150363
1	Spring	I	04130720	04130720
1	Shutoff Collar	J	10552545	10552545
1	Clutch ball seat	K	10548725	10548725
4	4.76mm Ball Bearing	L	04055935	04055935
16	2.38mm Ball Bearing	M	04055901	04055901
1	Retaining Ring	N	04148359	04148359
1	Pin	O	04148342	04148342
9	3.18mm Ball Bearing	P	04055919	04055919
1	Clutch cam	Q	10549012	10549012
1	Clutch Driver	R	10548014	10548014
1	Spring	S	04137071	04137071
1	Shutoff Plunger	T	10547974	10547974
1	Hex Bit	U	53446936	53446936
1	Washer (for spacing pushrod)	Not Shown	53446944	53446944
1	Laminated Washer (for spacing pushrod)	Not Shown	53446530	53446530
1	Pushrod	Not Shown	53445821	53445821

Tooling requirements

Specific Tools

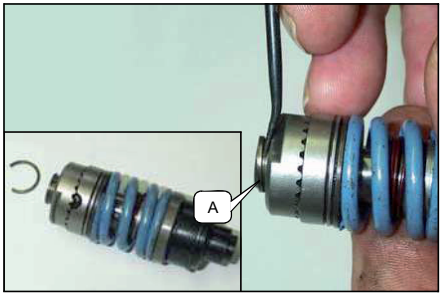
CCN	Ref. CM	Designation
53447868	OM296	Snapring Tool

Standard Tools and Products

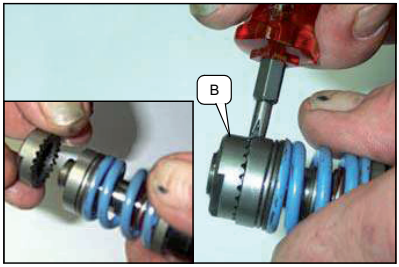
- Retaining Ring Pliers
- Tool Pick
- IR 40036-1 Clutch Grease
- Screwdriver for clutch adjustment (provided with the angle wrench)

Disassembly Instructions

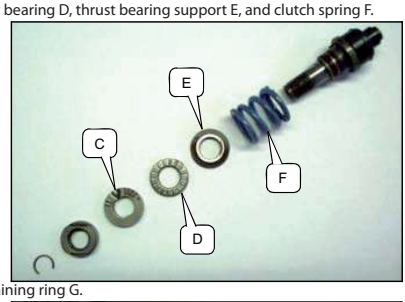
Slip retaining clip A off of shaft with retaining ring pliers to unlock adjustment nut.



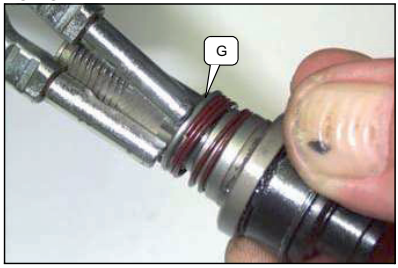
Remove adjustment nut B by rotating screw driver clockwise.



Then remove adjusting nut lock C, thrust bearing D, thrust bearing support E, and clutch spring F.



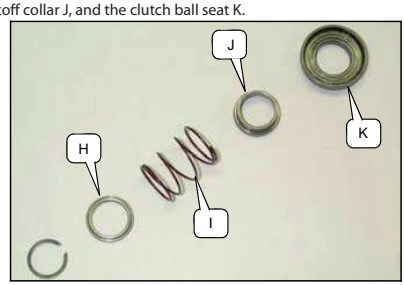
Use retaining ring pliers and remove retaining ring G.



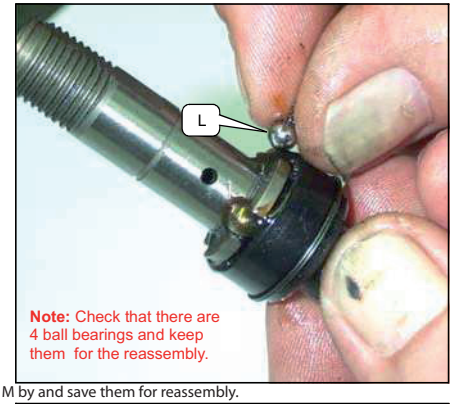
CAUTION

It is very important to reform the clip for the reassembly. Close the clip with pliers and reshape if twisted.

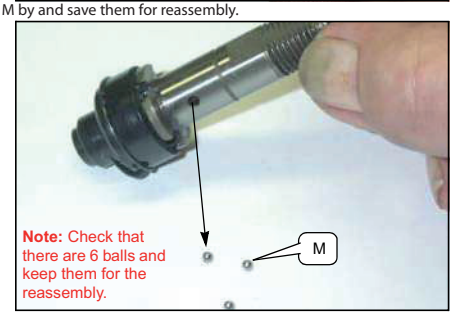
Remove the clutch guide H, spring I, shutoff collar J, and the clutch ball seat K.



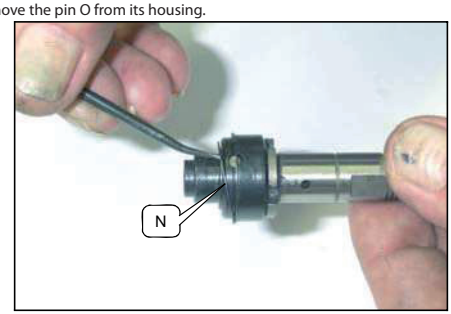
Remove the 4x4.76mm ball bearings L.

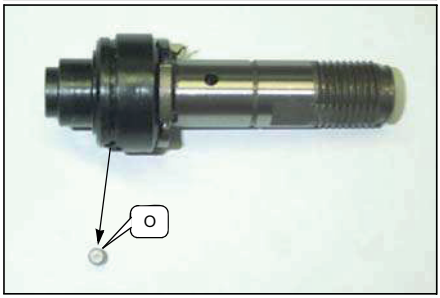


Remove the 6x2.38mm ball bearings M by and save them for reassembly.

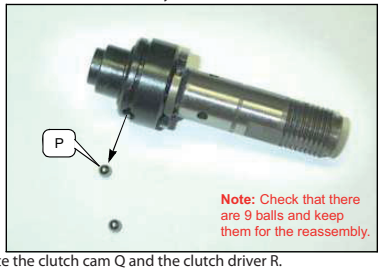


Remove the retaining ring N and remove the pin O from its housing.

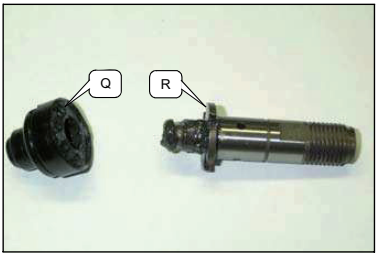




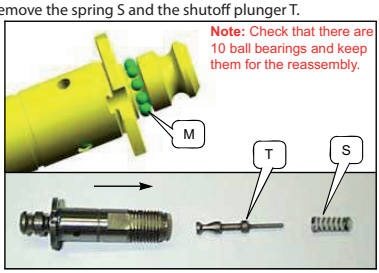
Remove the 9x3.18mm ball bearings P and save them for reassembly.



Once all ball bearings are removed, separate the clutch cam Q and the clutch driver R.



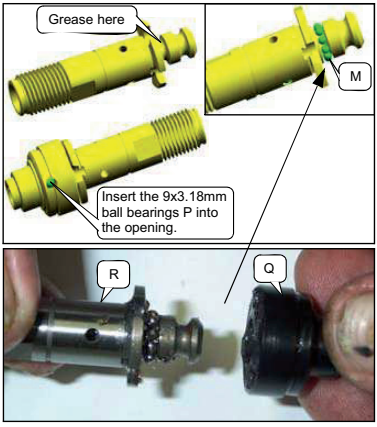
Remove the 10x2.38mm ball bearings M. Remove the spring S and the shutoff plunger T.



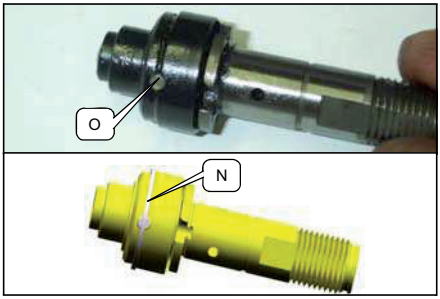
Clean the pieces of the clutch assembly using degreaser.

Assembly Instructions

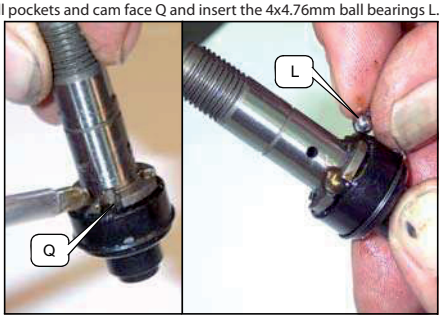
Grease the groove of the clutch driver R with IR grease 40036-1. Place the 10x2.38mm ball bearings M into the groove. Grease will hold them in place. Grease internal balltrack in clutch cam Q with IR 40036-1. Insert the cam into the clutch driver R. Then insert the 9x3.18mm ball bearings P.



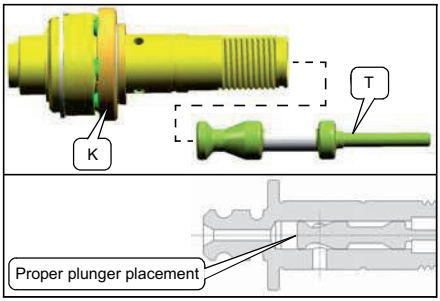
Place the pin O then the retaining ring N onto the clutch cam.



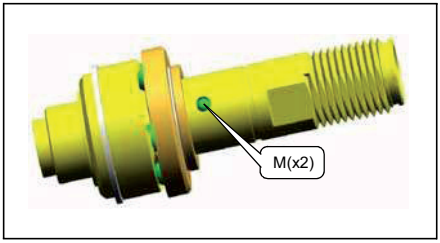
Apply 2 cc's of IR grease 40036-1 to ball pockets and cam face Q and insert the 4x4.76mm ball bearings L.



Grease the groove in clutch ball seat K and insert on clutch driver. Insert shutoff plunger T into the clutch driver. Ensure that the end of the valve stem is not inserted more than 3 to 4mm into the end of the clutch driver (see cross-section).

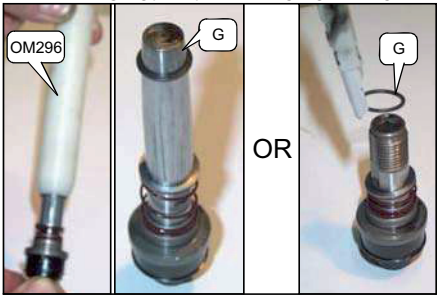


Grease the three holes on clutch driver and insert two 2.38mm ball bearings M per hole.

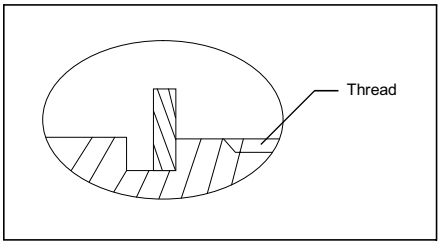


Assemble the shutoff collar J, the spring I, and the clutch guide H.

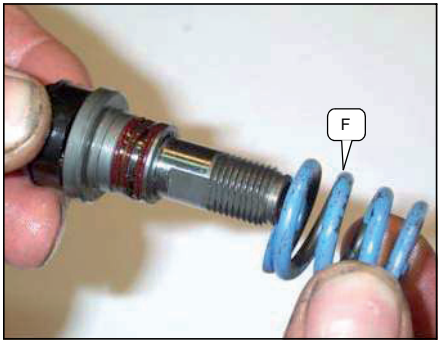
With the assistance of the OM296 fixture or the retaining ring pliers, place retaining ring G in the groove of the clutch driver.

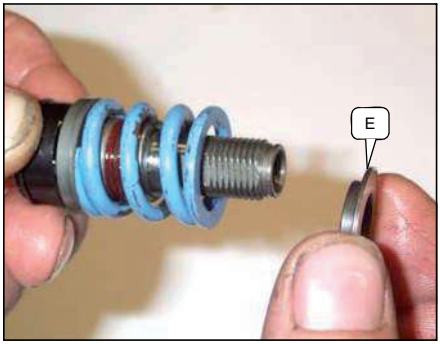


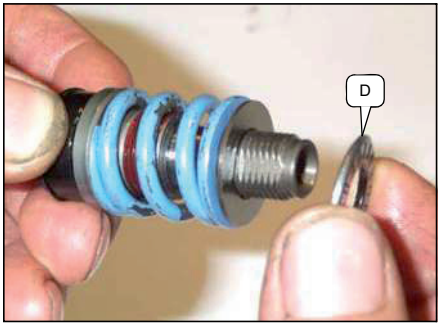
Ensure the ring is correctly positioned in the stop.



Apply a small amount of grease to both ends of clutch spring F and insert onto clutch driver. Then grease both faces on thrust bearing support E and thrust bearing D and insert onto shaft.

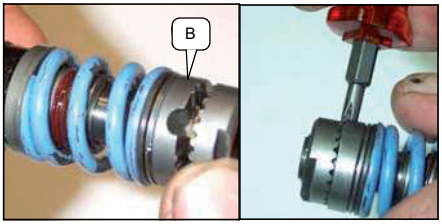




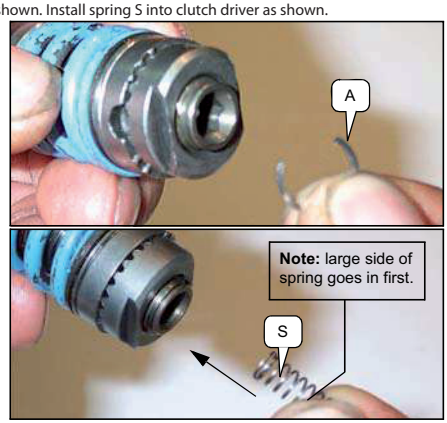


Install adjusting nut lock C as shown.

Thread on adjusting nut B.

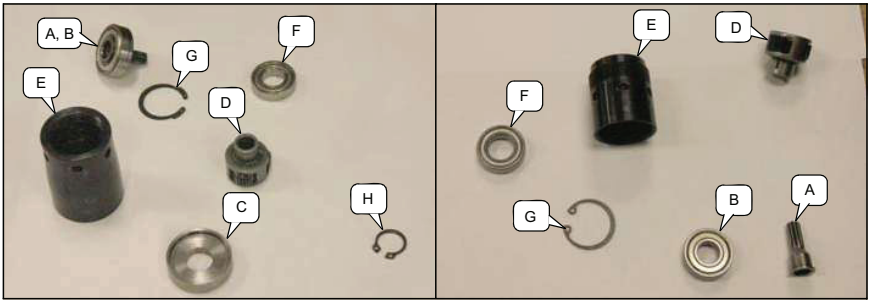


Put retaining clip A on the groove as shown. Install spring S into clutch driver as shown.



Second Stage Gear Module

Component Descriptions



			53450979	53454047	53453908	53453882
Qty	**Designation**	**Callout**	**CCN**	**CCN**	**CCN**	**CCN**
1	Pinion/Sun Adapter	A	53446324	53448783	53446506	53445870
1	Bearing	B	04361796	04361796	04361796	04361796
1	Bearing Cap	C	53446381	53445649	53445649	53445649
1	Gearhead Assembly	D	80159007	80159049	53421624	53512869
1	Ring Gear	Not Shown	-	53445953	53445953	53445953
1	Gearcase	E	53446365	53445961	53445961	53445961
1	Bearing	F	-	04362653	04362653	04362653
1	Retaining Ring Int.	G	-	53470456	53470456	53470456
1	Retaining Ring Ext.	H	-	04360608	04360608	04360608

			53453981	53454088	80149909	80149867
Qty	**Designation**	**Callout**	**CCN**	**CCN**	**CCN**	**CCN**
1	Pinion/Sun Adapter	A	53446043	53448783	80149610	80149610
1	Bearing	B	04361796	04361796	04361796	04361796
1	Bearing Cap	C	53445649	53445649	53445649	53445649
1	Gearhead Assembly	D	53439030	80159049	80149701	80149701
1	Ring Gear	Not Shown	-	53445953	-	-
1	Gearcase	E	53445631	53452488	80149594	80148687
1	Bearing	F	-	04362653	04374518	04374518
1	Retaining Ring Int.	G	04361366	53470456	80151343	80151343
1	Retaining Ring Ext.	H	-	04360608	-	-

			80150709	80149933	80149891
Qty	**Designation**	**Callout**	**CCN**	**CCN**	**CCN**
1	Pinion/Sun Adapter	A	80149644	80149610	80149610
1	Bearing	B	04361796	04361796	04361796
1	Bearing Cap	C	53445649	53445649	53445649
1	Gearhead Assembly	D	80150733	80149784	80149784
1	Ring Gear	Not Shown	-	-	-
1	Gearcase	E	80148687	80149594	80148687
1	Bearing	F	04374518	04374518	04374518
1	Retaining Ring Int.	G	80151343	80151343	80151343
1	Retaining Ring Ext.	H	-	-	-

Tooling Requirements

Standard tools and products

- Manual Press
- IR 90 Grease (or equivalent)
- Degreaser

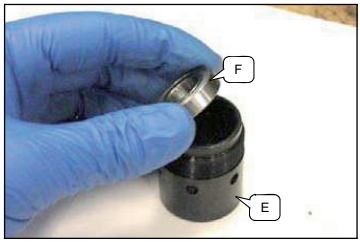
Assembly Instructions

Cleaning

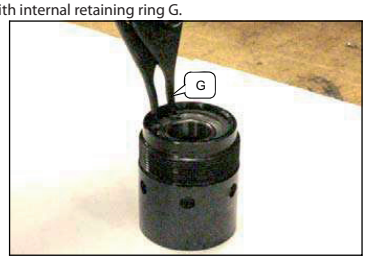
Wash the gearhead assembly D with degreaser.

Straight Tool Assembly Instructions

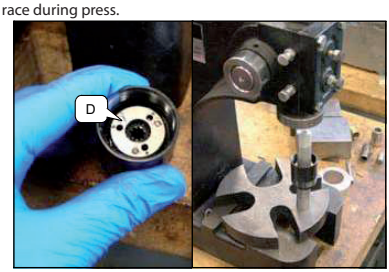
Slide bearing F into gearcase E on the threaded side.



Using retaining ring pliers secure bearing with internal retaining ring G.

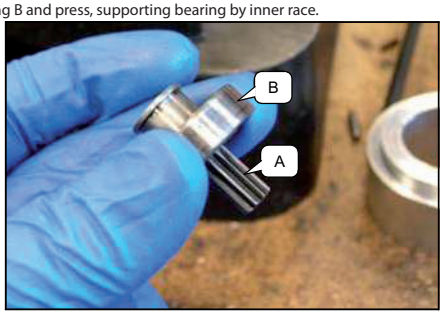


Place gearhead assembly D into gearcase E, check to ensure teeth match, and press assembly into bearing.
Note: be sure to support bearing by inner race during press.

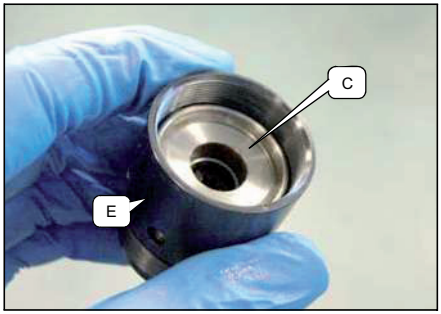


Check to ensure gearhead assembly D is fully pressed onto bearing (assembly will be below the top of the ring gear teeth).

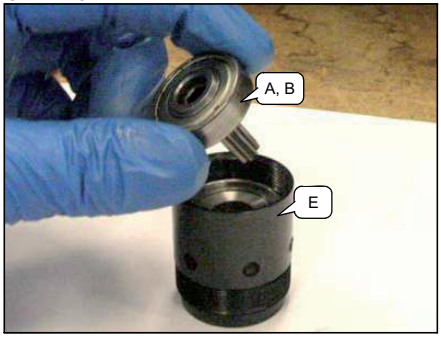
Assemble pinion adapter A into bearing B and press, supporting bearing by inner race.



Place laminated washer into bearing cap C and assemble into gearcase E.

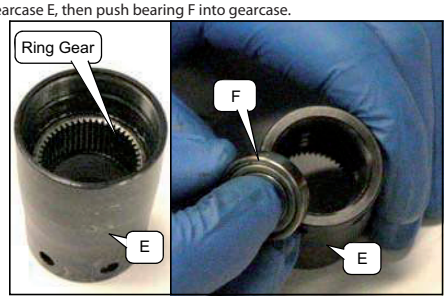


Match the teeth and slide pinion/bearing A/B into gearcase E.

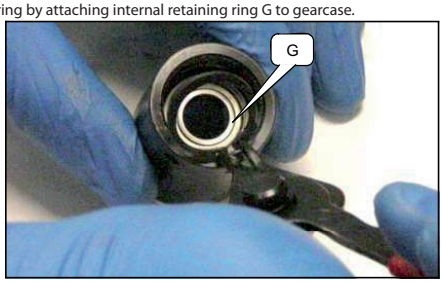


Angle Tool Assembly Instructions

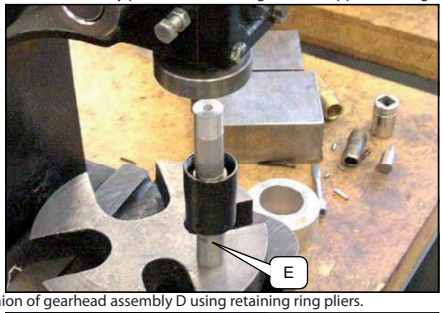
If required, assemble ring gear into gearcase E, then push bearing F into gearcase.



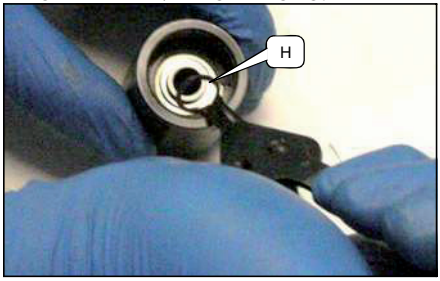
Using retaining ring pliers, secure bearing by attaching internal retaining ring G to gearcase.



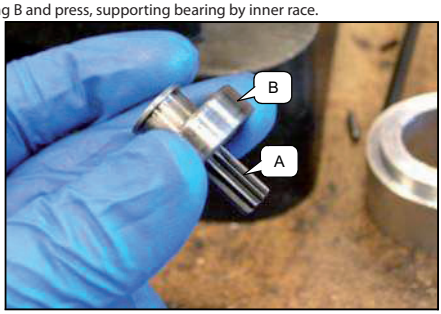
Place gearhead assembly D into gearcase E and manually press it onto bearing F. Note: support bearing by inner race.



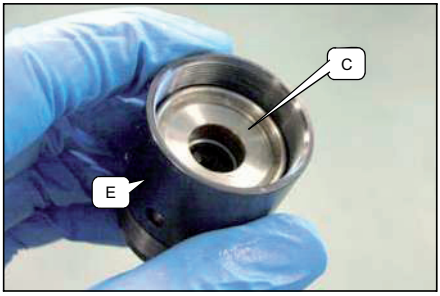
Affix external retaining ring H onto pinion of gearhead assembly D using retaining ring pliers.



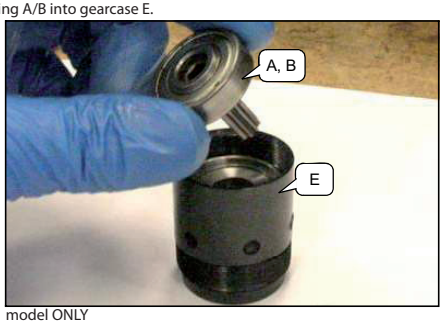
Assemble pinion adapter A into bearing B and press, supporting bearing by inner race.



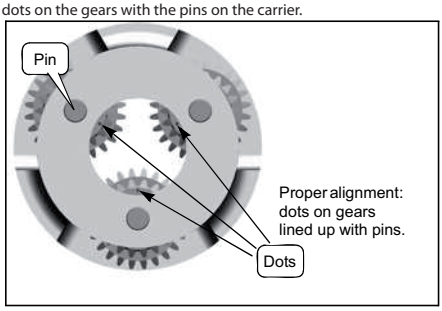
Place laminated washer into bearing cap C and assemble into gearcase E.



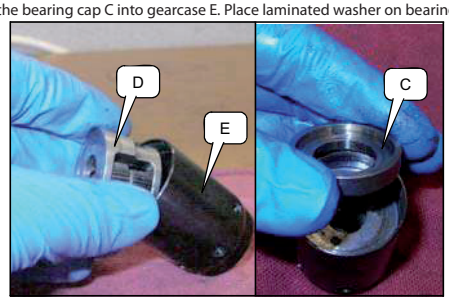
Match the teeth and slide pinion/bearing A/B into gearcase E.



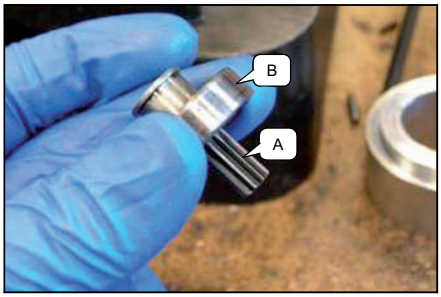
Angle Tool Assembly Instructions - 011 model ONLY
Time the planet gears by lining up the dots on the gears with the pins on the carrier.



Slide gearhead assembly D and then the bearing cap C into gearcase E. Place laminated washer on bearing cap.

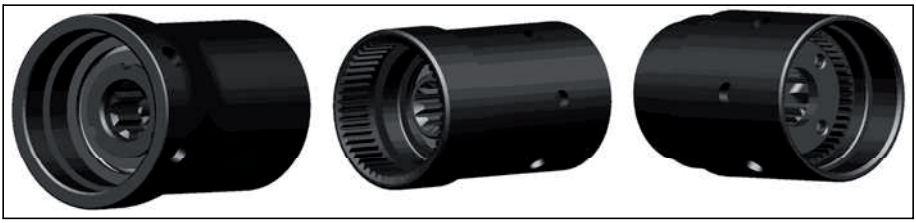


Press pinion adapter A into bearing B.
Note: during press support bearing by inner race.

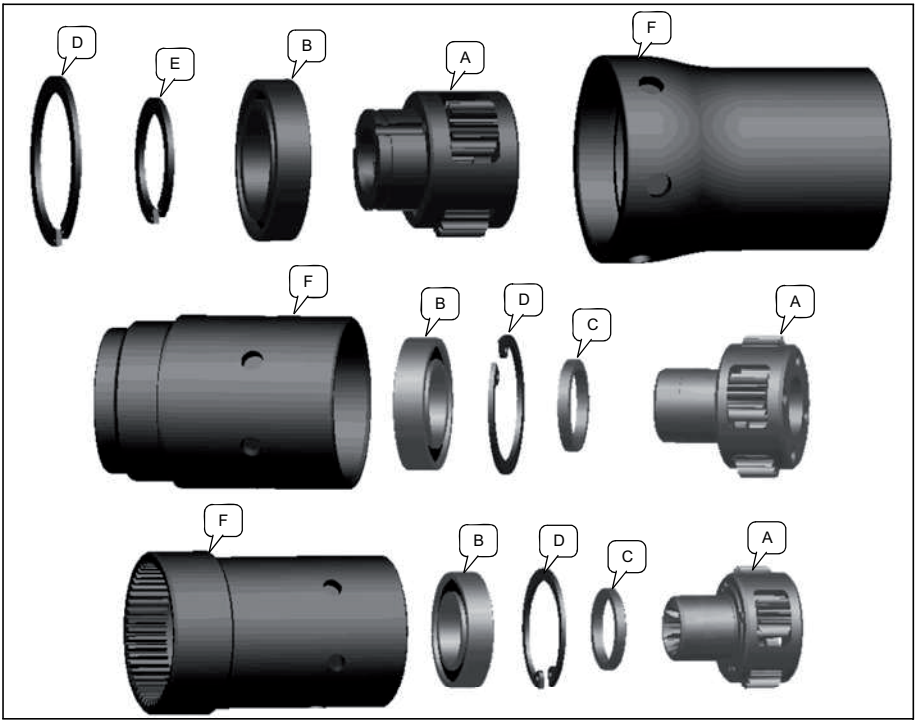


Slide pinion/bearing A/B into gearcase MAKING SURE gears are still aligned correctly.

Third Stage Gear Module



Component Descriptions



			53452561	80150774	80151558
Qty	**Designation**	**Callout**	**CCN**	**CCN**	**CCN**
1	Spindle Assembly	A	80159056	80151517	80151517
1	Bearing	B	04361408	03471968	03471968
1	Bearing Spacer	C	-	80149800	80149800
1	Snapring	D	04361622	96710637	96710637
1	Snapring	E	04361366	-	-
1	Gearcase	F	53452587	80150782	80150352

Tooling Requirements

Standard tools and products

- Manual Press
- IR 90 Grease (or equivalent)
- Degreaser

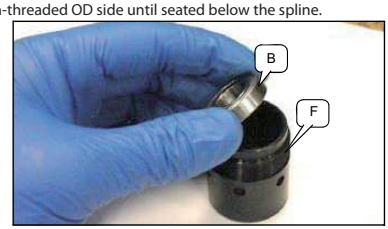
Assembly Instructions

Cleaning

Wash the gearhead assembly D with degreaser.

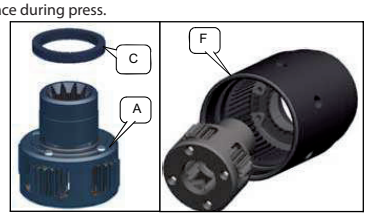
Straight Tool Assembly Instructions (80150774, 80151558)

Slide bearing B into gearcase F on the non-threaded OD side until seated below the spline.



Using retaining ring pliers secure bearing with internal retaining ring D.

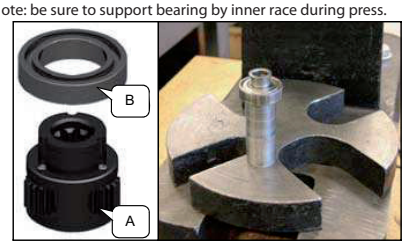
Slide spacer C on spindle assembly A. Place spindle assembly into gearcase F, check to ensure teeth match, and press assembly into bearing.
Note: be sure to support bearing by inner race during press.



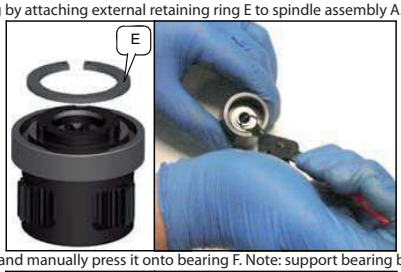
Check to ensure spindle assembly A is fully pressed onto bearing (assembly will be below the top of the ring gear teeth).

Angle Tool Assembly Instructions

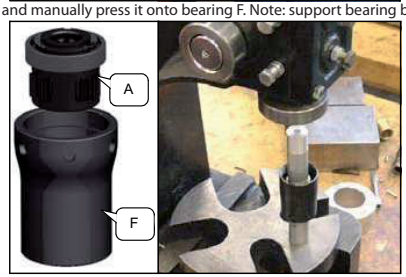
Press bearing B on spindle assembly A. Note: be sure to support bearing by inner race during press.



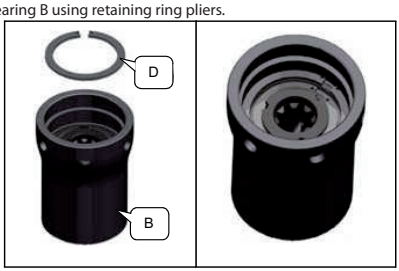
Using retaining ring pliers, secure bearing by attaching external retaining ring E to spindle assembly A.



Place spindle assembly A into gearcase F and manually press it onto bearing F. Note: support bearing by outer race.



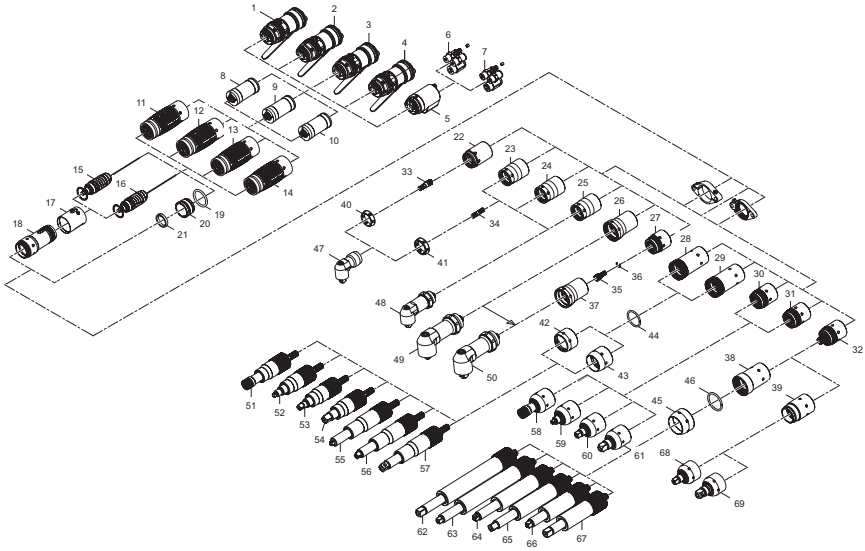
Affix internal retaining ring D on top of bearing B using retaining ring pliers.



Check to ensure spindle assembly A is fully pressed onto bearing (assembly will be below the top of the ring gear teeth).

Complete Tool Assembly

Components



Module	CCN	Designation
Housing Modules	53453890	NPT Direct
	53453650	NPT ASO
	80164627	BSP Direct
	53445573	BSP ASO
	53452785	Remote - Housing
	80156763	Inlet Kit Metric
	80156771	Inlet Kit Inch
Motor Modules	53414819	9 Teeth
	53505095	10 Teeth
	53448684	11 Teeth
First Stage Modules	53446126	011, 040 Angle / 027 In-line
	53448700	015, 055 Angle / 012, 020, 046 In-line
	53446159	020 Angle
	53445987	030 Angle / 015 In-line
Clutch Modules	53446951	ASO (Blue spring)
	80158942	ASO (Brown spring)
	80149842	ASO (Housing)
	80150204	ASO (Cover)
	53431920	Direct Drive (O-Ring)
	53450995	Direct Drive (Spacer)
	53450987	Direct Drive (Housing)

Module	CCN	Designation
Second Stage Modules	53450979	011 Angle
	53454047	015 Angle
	53453908	020 Angle
	53453882	030 Angle
	53453981	040 Angle
	53454088	055 Angle
	80149909	012, 015 In-line / Floating Spindle
	80149867	012, 015 In-line / Solid Spindle
	80150709	046 In-line
	80149933	020, 027 In-line / Floating Spindle
	80149891	020, 027 In-line / Solid Spindle
Third Stage Modules	53452561	055 Angle
	80151558	046 In-line / Floating Spindle
	80150774	046 In-line / Solid Spindle
Adaptors	53452496	055 Angle (Adaptor)
	53445458	011 Angle
	53445581	015, 020 Angle

Module	CCN	Designation
Coupling	53486411	055 Angle (Snapring)
	04695722	012-027 In-line / Floating Spindle (Snapring)
	04341368	046 In-line / Floating Spindle (Snapring)
	53453668	011 Angle
	53453486	015, 020 Angle
	04696241	012-027 In-line / Floating Spindle
	04695714	012-027 In-line / Floating Spindle (No flange)
	22041180	046 In-line / Floating Spindle
Anglehead Modules	53453619	25 Size
	53453601	28 Size
	80152333	35 / 08 Drive Size
	53453627	35 / 06 Drive Size

Module	CCN	Designation
Floating Spindle Modules	4696019	012-020 In-line / Q Drive / 04 Size
	4695987	012-020 In-line / S Drive / 04 Size
	4695995	012-027 In-line / S Drive / 06 Size
	4696001	012-027 In-line / S Drive / 08 Size
	4695730	012-020 In-line / S Drive / 04 Size
	4695953	012-027 In-line / S Drive / 06 Size
	4695961	012-027 In-line / S Drive / 08 Size
	80102056	046 In-line / S Drive / 06 Size
	80114739	046 In-line / S Drive / 08 Size
	80114747	046 In-line / S Drive / 06 Size
	80114754	046 In-line / S Drive / 08 Size
	80114770	046 In-line / S Drive / 06 Size
	80114762	046 In-line / S Drive / 08 Size
Solid Spindle Modules	80167869	012-020 In-line / Q Drive / 04 Size
	80148604	012-020 In-line / S Drive / 04 Size
	80148612	012-027 In-line / S Drive / 06 Size
	80148646	012-027 In-line / S Drive / 08 Size
	80149628	046 In-line / S Drive / 06 Size
	80149685	046 In-line / S Drive / 08 Size

Tooling Requirements

Specific Tools

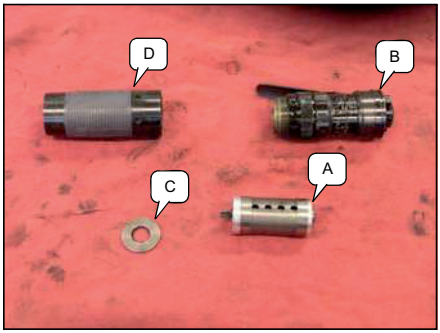
Qty	CCN	Ref. CM	Designation
2	GEA40-478		Spanner Wrench

Standard Tools and Products

- IR 90 Grease
- Shim Gauge
- Torque wrench

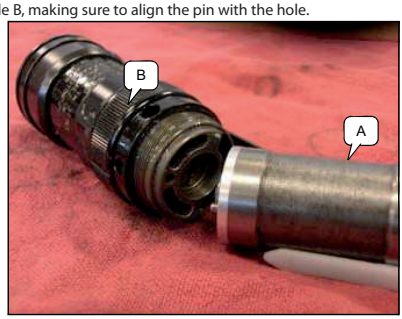
Assembly Instructions

Motor Assembly



Qty	Designation	Callout
1	Motor Module	A
1	Housing Module	B
1	Washer	C
1	Motor Housing	D

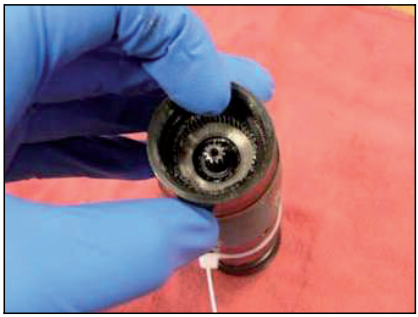
Place motor module A on housing module B, making sure to align the pin with the hole.



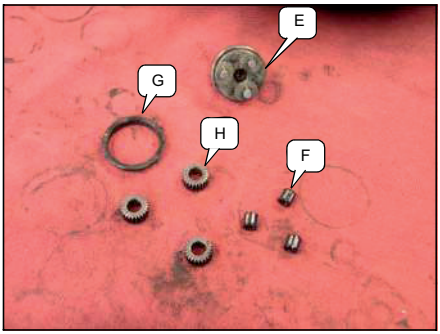
Place the washer C on top of the motor, and slide the motor housing D over it.

Rotate the output of the gearhead assembly by hand to ensure free movement.

Rotate the rotor by hand to ensure it is moving freely.

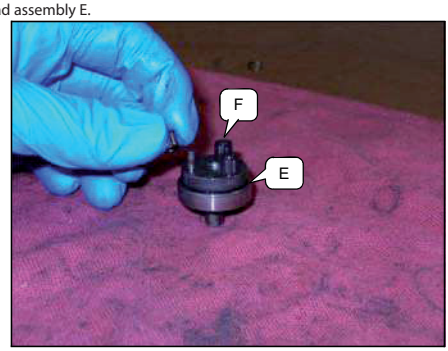


First Stage Assembly

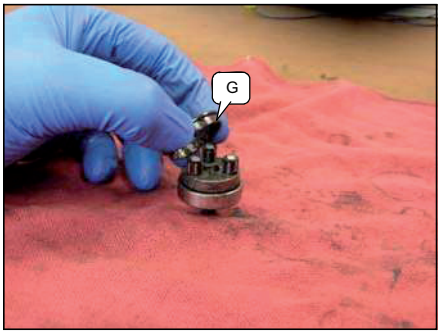


Qty	Designation	Callout
1	1st Stage Gearhead Assembly	E
3	Needle Bearing	F
1	Spacer	G 3
3	Planet Gear	H

Place needle bearings F onto gearhead assembly E.

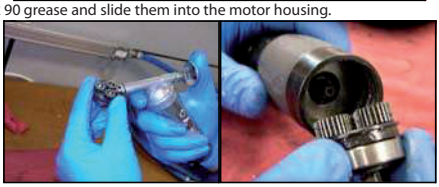


Slide spacer G onto the assembly.
Note: step is on the upper side.



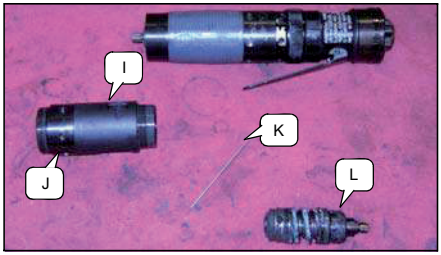
Slide planets H over the needle bearings.

Grease the planet gears with 2cc's of IR 90 grease and slide them into the motor housing.



Rotate the output of the gearhead assembly by hand to ensure free movement.

Clutch Assembly



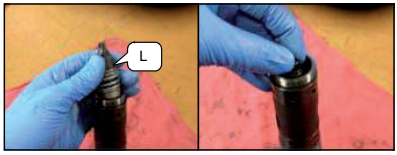
Qty	Designation	Callout
1	Clutch Cover	I
1	Clutch Housing	J
1	Pushrod	K
1	Clutch Assembly	L

Slide push rod K into rotor, and push clutch cover I onto clutch housing J.

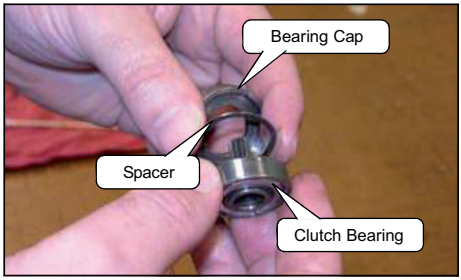
Screw clutch housing J onto motor housing.

FOR ANGLE TOOLS: Tighten to 70 N-m using two spanner wrenches.
FOR INLINE TOOLS: Tighten to 40 N-m using two spanner wrenches.

Make sure clutch assembly L is well lubricated, then slide it into housing, seat it on the 1st stage gearhead, and rotate to ensure free movement.



Take the clutch bearing, bearing cap, and spacer from 2nd stage module and place them on top of the clutch. By hand, lightly press on bearing cap until clutch is fully seated. Cap should be flush against the clutch housing and clutch should have less than 0.2mm of axial play (if more, add P/N 131908 to other side of clutch).



If bearing cap is not flush, use a shim gauge to measure the gap between the cap and the top of the clutch housing. Remove the quantity of layers of the spacer required to exceed measured gap. Note: axial play of clutch should be greater than 0.05mm but less than 0.20mm.

Second/Third Stage

Place clutch bearing, spacer, and bearing cap on 2nd stage. Lubricate the 2nd stage module with 2cc's of IR 90 grease. Then match the sun adapter to the hex bit, hand tighten, and perform pushrod adjustment.

To Adjust Pushrod:

1. Connect air to tool.
2. Run tool with 2nd stage on but anglehead off.
3. While running, back the 2nd stage off until the tool stops.
4. Tighten the module until the tool just starts rotating again.
5. Mark position of 2nd stage, then hand screw it on until tight.
6. If the module tightens in ½ to ¾ turn (0.5mm-0.75mm), pushrod is properly adjusted.
7. If not, record the number of turns to tighten it.
8. Use thread pitch = 1mm (1 complete rotation = 1mm) to adjust length of pushrod (e.g. 1.5 rotations to tighten module, remove between 0.75mm and 1mm of pushrod)
9. Repeat steps 1-8 until pushrod is adjusted correctly.

Note: If less than 1/2 turn, new pushrod.

Once pushrod is adjusted:

FOR ANGLE TOOLS: Using two spanner wrenches tighten 2nd stage to 70 N-m.
FOR INLINE TOOLS: Using two spanner wrenches tighten 2nd stage to 40 N-m

For the 055 angle tool, thread third stage on and use spanner wrenches to tighten to 70 N-m. For the 046 inline tool, tighten it to 40 N-m.

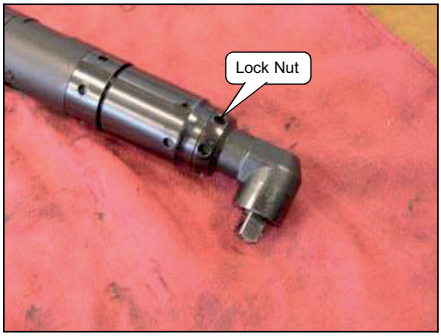
Output

For Angle Tools

Thread lock nut on anglehead all the way. Thread the anglehead on the tool and hand tighten until snug.
Note: left-handed threads. DO NOT tighten the lock nut.

Thread the anglehead off until preferred orientation.

Using the spanner wrenches, tighten lock nut to 50 N-m (R25), 60 N-m (R28), 85 N-m (R35 3/8”), or 100 N-m (R35 1/2”).
Note: left-handed threads.



For Inline Tools

Floating Spindle:
Match pinion to 2nd/3rd stage and tighten to 30 N-m.

Solid Spindle:
For 046 tool, match pinion to 3rd stage and tighten to 60 N-m.
For all other tools, match pinion to 2nd stage and tighten to 40 N-m.

Related Documentation

For additional information refer to:
Product Safety Information Manual 04585006.
Product Information Manual 80160336.
Parts Information Manual 80160344.

Manuals can be downloaded from ingersollrandproducts.com.

Notes:

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