

PRICE \$1.00

# SALSBURY TORQUE CONVERTERS



# SHOP MANUAL

SECOND EDITION

By Publication, Sale, or Distribution of this manual, Salsbury Corporation in no way waives or otherwise nullifies any of the terms and conditions of its warranty.



1010 EAST 62nd STREET, LOS ANGELES, CALIFORNIA 90001 • PHONE (213) 232-6181

# INDEX

**DO NOT RUN AN ENGINE  
EQUIPPED WITH DRIVE  
PULLEY IF THE BELT IS  
NOT ENGAGED WITH THE  
DRIVEN PULLEY**

SUBJECT	PARAGRAPH	PAGE		
No Load Engine Operation	1-A-1	3	<b>GENERAL</b>	<b>1</b>
Testing Shielding	1-A-2	3		
Maintenance Schedule	1-A-3	3		
Removing Seized Pulleys	1-A-4 1-A-8	3		
How It Works - Theory		4		
Warranty		5		
Torque Requirements		6		
Visual Identification - Drive Pulleys		8-9		
Visual Identification - Driven Pulleys		10		
Pulley Part Number Location		9		
			<b>DRIVE</b>	<b>2</b>
			<b>DRIVEN</b>	<b>3</b>
			<b>BELTS</b>	<b>4</b>

**INDEX-1**

## Remove Drive Pulley before making high speed no load engine test.

1-A-1 If it is necessary to operate an engine without a load for testing and the belt is removed, the drive pulley must also be removed.

1-A-2 Before testing a drive assembly, always replace the shielding installed by the vehicle manufacturer. In the event that a scatter shield is not available, fabricate one from steel or a material of similar tensile strength and ductility. The scatter shield must be designed to enclose both pulleys and contain any parts that may break away.

1-A-3 Inspect the drive and driven pulleys monthly if used frequently. Clean and service before each season.

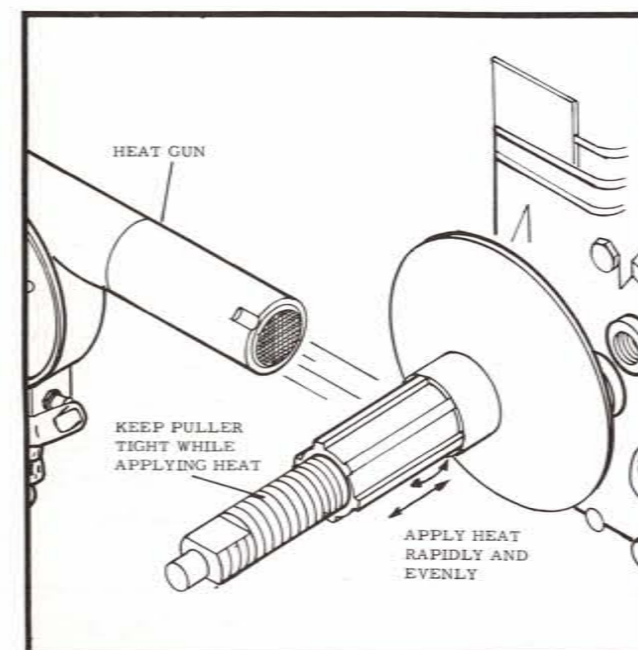


FIGURE 1-A-1

1-A-4 Gear pullers must not be used on either fixed or movable face or ramp plate. Use Salisbury pullers to remove. See price section of the Master Service Manual for the list of pullers, application and price.

1-A-5 Following procedures are recommended for the removal of drive and driven pulley hubs that are seized to the shaft.

1-A-6 Pulleys can be disassembled on the shaft if they do not slide off with reasonable amount of pressure with pullers.

After disassembly, use heat or tap sharply but lightly with a light hammer. Apply pressure with the puller (figure 1-A-1) while heating or tapping. A heat gun is the recommended source of heat. If open flame is used, keep away from fuel lines, fuel tanks, carburetors, and plastic hoods. Before using heat, remove any solvent that may have been used with compressed air and dry thoroughly.

1-A-7 Some early Model 500 and 700 Series drive pulleys did not have threaded hubs. After removing ramp plate, place two 703046 spacers between spider and snap ring. This will equal the thickness of the ramp plate and prevent movement of the spider when a gear puller is used. Care must be taken when positioning the gear puller to prevent moving or damaging the spider.

1-A-8 Driven pulleys that have a snap ring on the hub can be pulled with a gear puller (figure 1-A-2). Place a close fitting tubular collar on the hub, replace the snap ring and position the gear puller. Enlarge the inside diameter of a drive pulley spider with emery cloth and slide on hub as a seat for the gear puller.

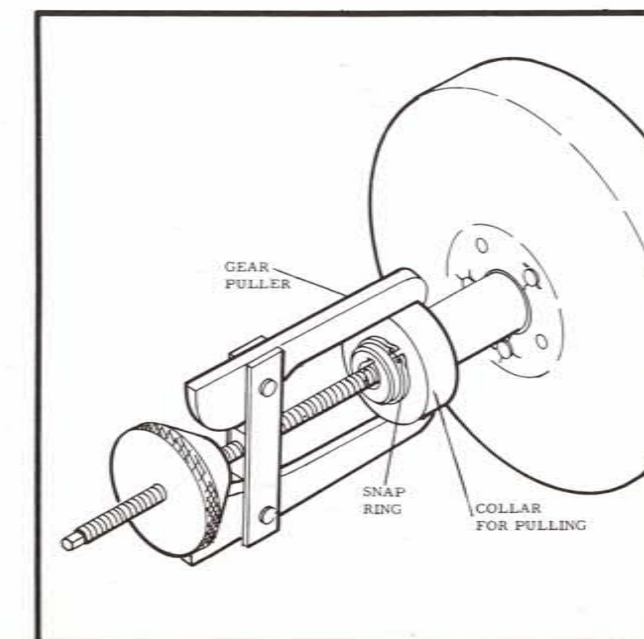


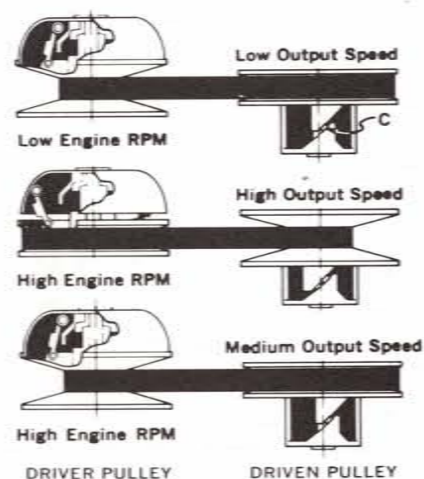
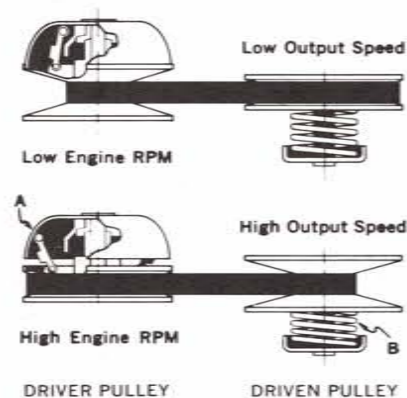
FIGURE 1-A-2

# HOW IT WORKS

Two types of driven pulley systems available:

SPEED SENSITIVE

TORQUE SENSITIVE



1-B-1 At low speeds the normal position of the driver pulley maintains the V - belt at a smaller diameter which with the corresponding larger diameter on the driven pulley, creates a "low gear" ratio.

1-B-2 As the speed increases, the centrifugally actuated roller weights (A) follow the contour of the bowl-shaped ramp plate, forcing the driver sheaves together. This action through the belt compresses the driven pulley spring (B), thus achieving a "high gear" ratio.

1-B-3 In the torque sensitive design (as in the speed sensitive design the normal position of the driver pulley at low engine speeds maintains the V-belt in a small diameter. Normal rotational force on cam actuator (C) keeps the driven pulley in "low gear" ratio.

1-B-4 As the driver pulley is essentially the same in both type units, higher engine speeds cause the roller weights to close the driver pulley sheaves creating a "high gear" ratio (note position of cam actuator).

1-B-5 If an increased load occurs (such as climbing a hill) after the vehicle is up to speed the cam actuator on the driven pulley takes over and automatically "downshifts" without loss of engine speed. Then engine remains at peak power range for all but the most severe loads, at which time it will shift into peak torque range.

# WARRANTY PROCEDURE

## O. E. M. INSTALLATIONS

Warranty claims should be handled in the manner prescribed by the vehicle manufacturer on which the Salsbury drive is installed.

## REPLACEMENT SALES

Warranty claims on Salsbury drives are to be processed by the dealer or distributor selling the drive as a replacement or new installation.

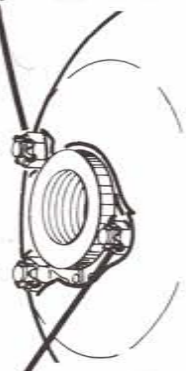
# TORQUE REQUIREMENTS

## RAMP PLATE RETAINER BOLTS

8-10 ft lbs  
Model 500  
700 Series

Torque Value for  
Torque Pin Nut  
Model 1190, 1195

Torque  
20 - 25 ft lbs



Secure with  
Cotter Key

## DRIVE PULLEY RETAINER

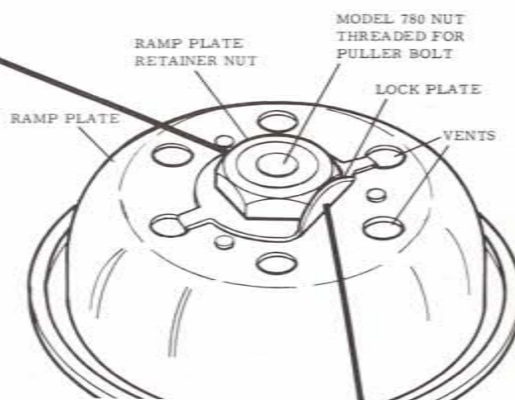
(not Salisbury Part)

Model	Torque
330	25 ft lbs
500	25 ft lbs
700 series	25 ft lbs
780	35 ft lbs
910	70 ft lbs
1190	80 ft lbs

Hold Drive Pulley with  
Strap Wrench  
Use S. A. E. Grade 5  
or better, 3 marks

## RAMP PLATE RETAINER NUTS

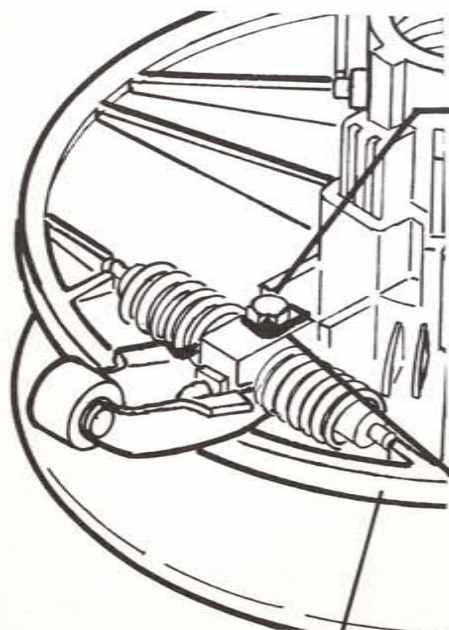
Model	Torque
780	125+15 ft lbs
910	150+15 ft lbs



Nut Must Be  
Locked Bend  
as Shown

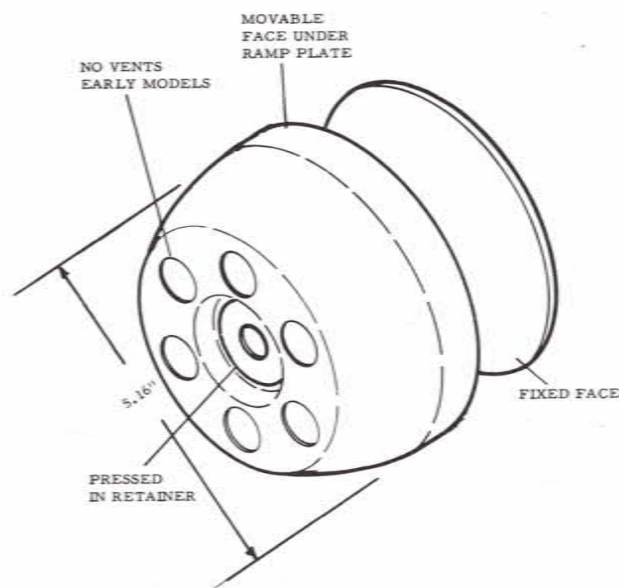
## HEX BOLT

Model	Torque
330	5-7 ft lbs
500	5-7 ft lbs
700 series	5-7 ft lbs
780	5-7 ft lbs
910	5-7 ft lbs
1190	5-7 ft lbs

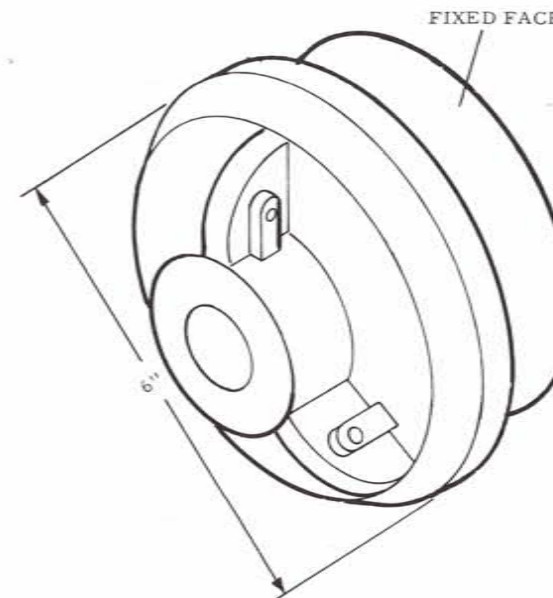


Bolt Must Be  
Locked Bend  
Plate as Shown

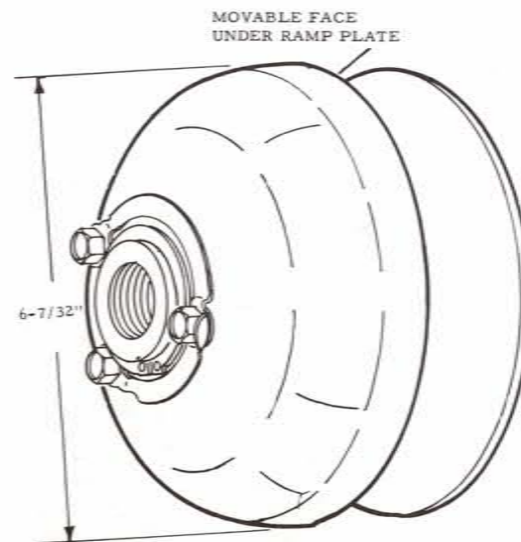
# VISUAL IDENTIFICATION GUIDE DRIVE PULLEYS



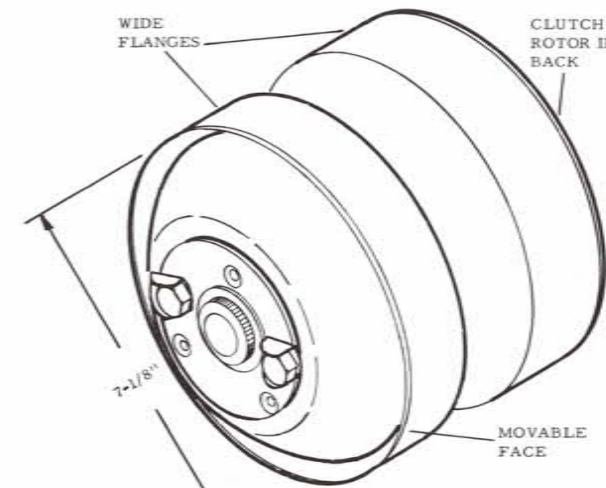
300



400

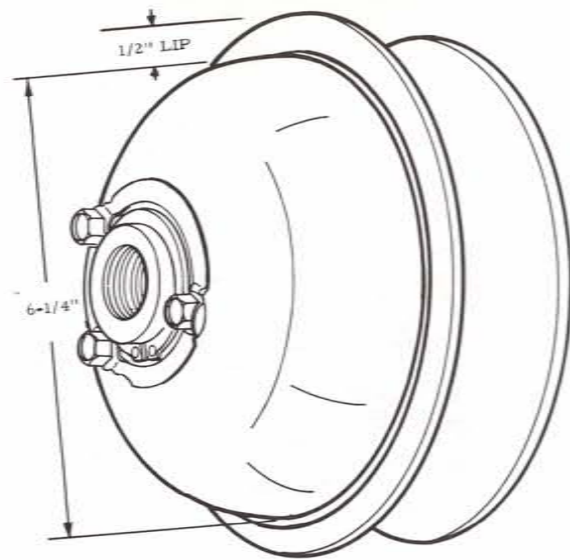


500

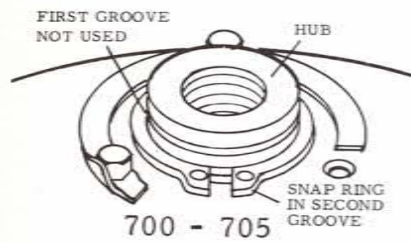


600

# VISUAL IDENTIFICATION GUIDE DRIVE PULLEYS

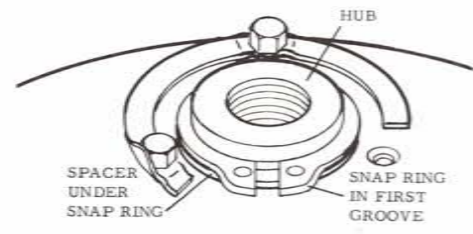


700 Series  
See Views A, B, C



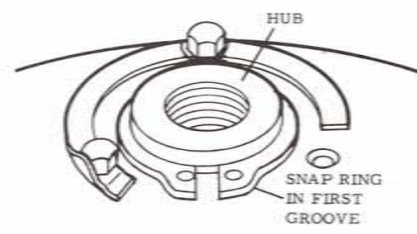
700 - 705

View A



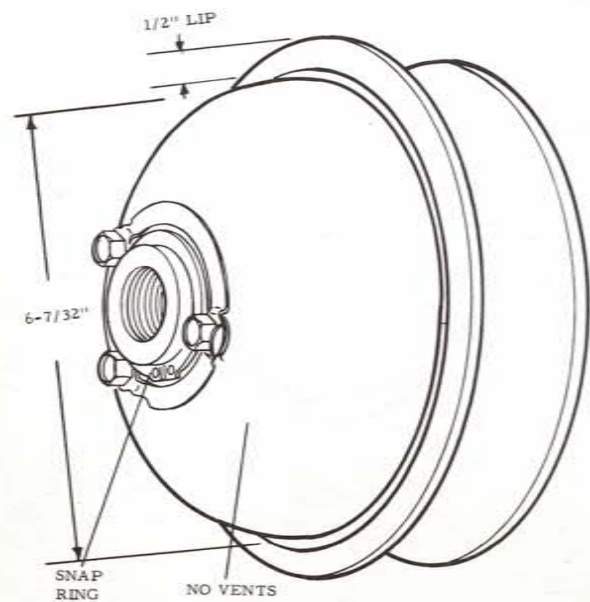
MODEL 780

View B

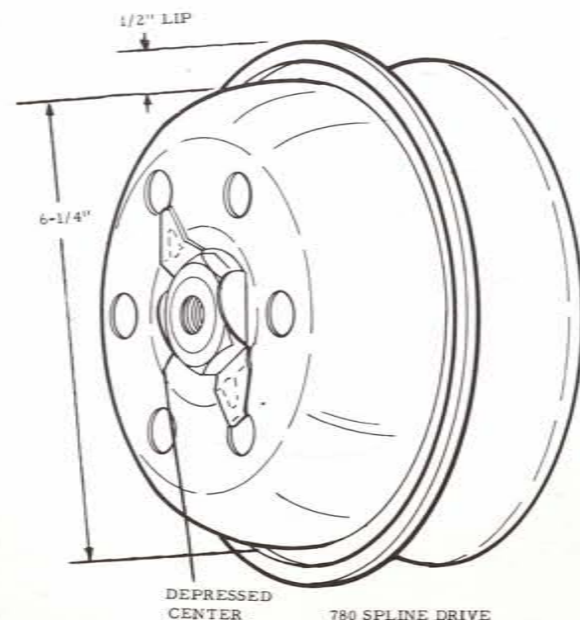


MODEL 770, 775, 790, 795

View C

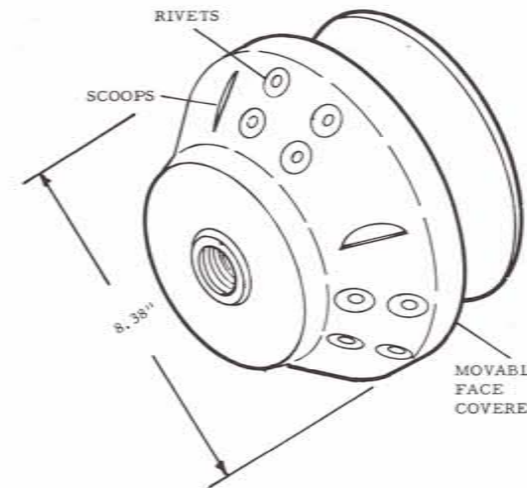


780 Spider Drive

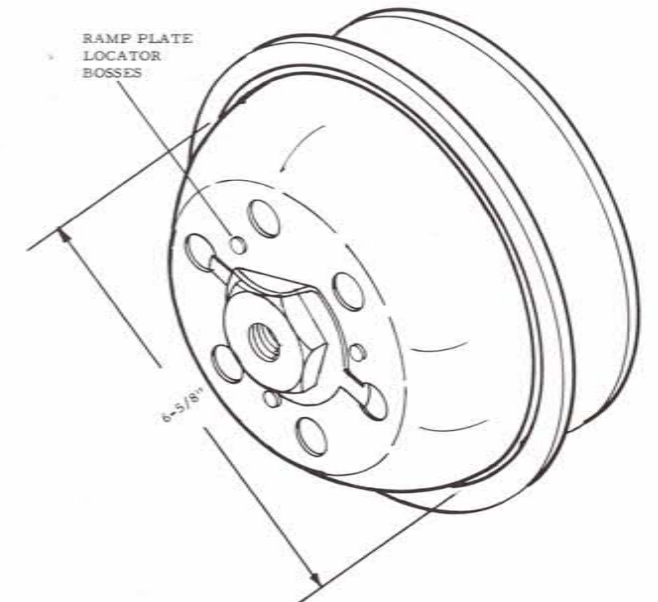


780 Spline Drive

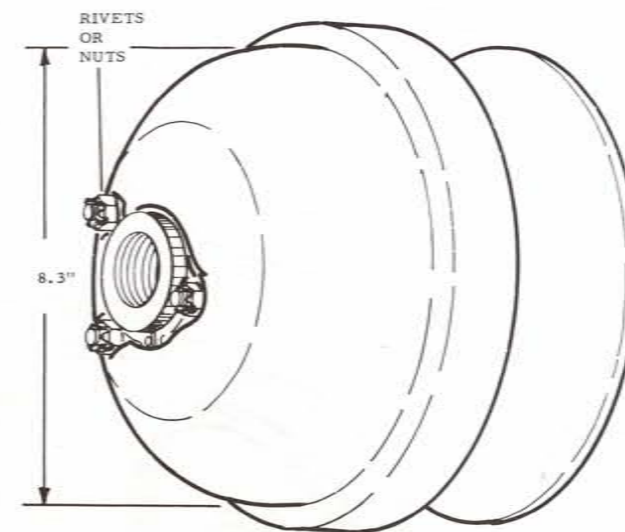
# VISUAL IDENTIFICATION GUIDE DRIVE PULLEYS



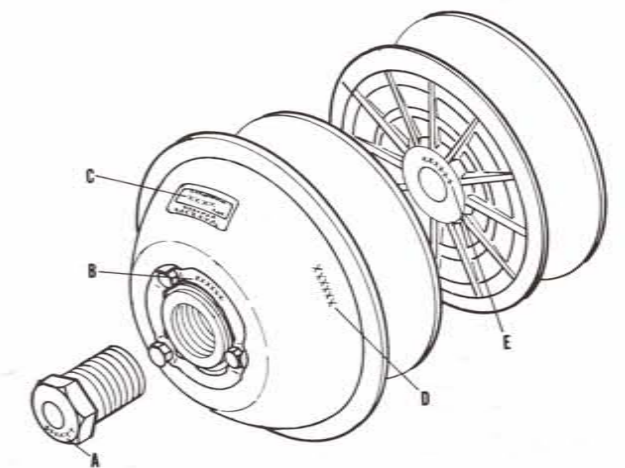
880



910



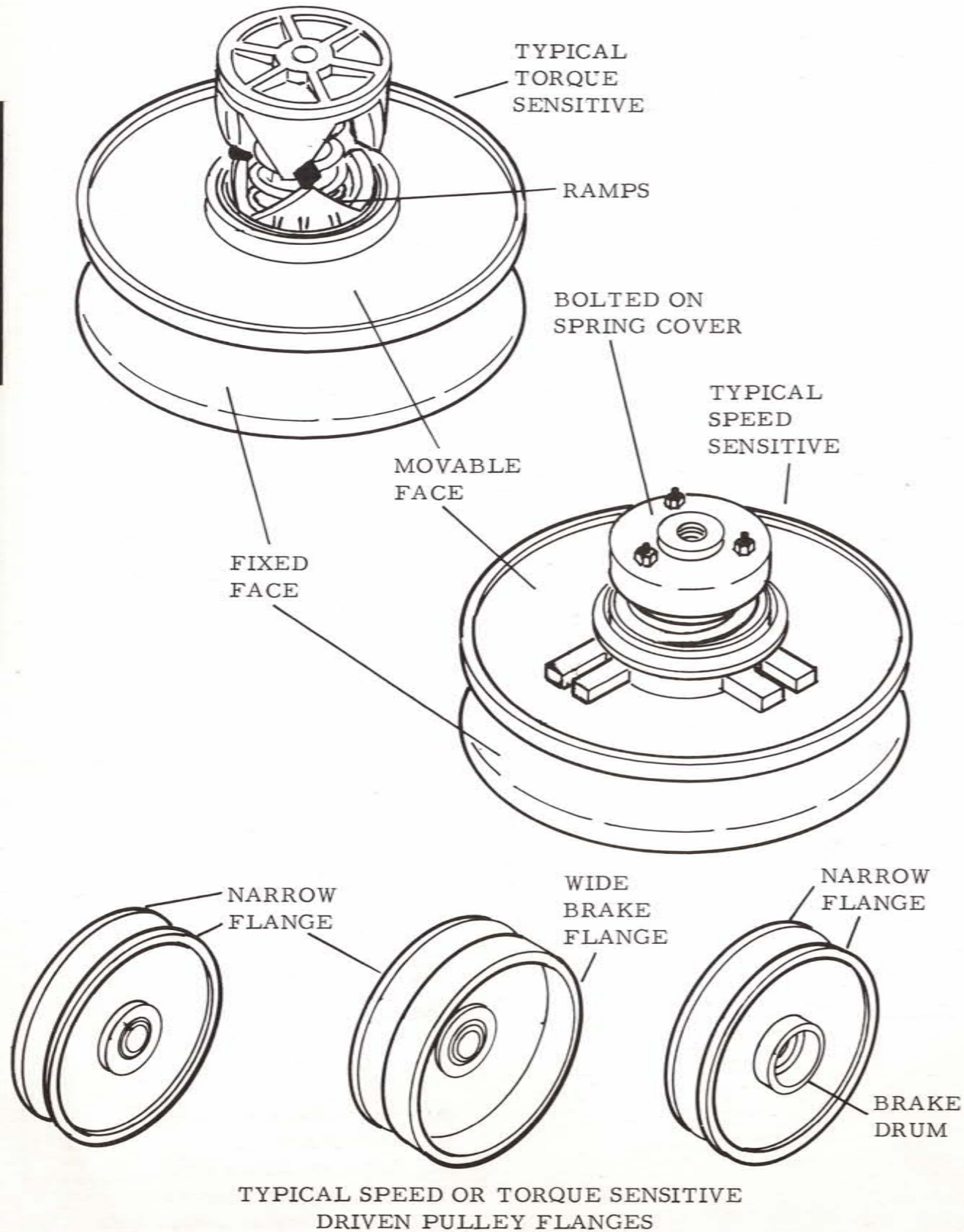
1190/1195



MODEL NUMBERS MARKED  
IN AREAS INDICATED

- A. Ramp Plate Retainer
- B. Lock Plate
- C. Label on Ramp Plate
- D. Ink Stamped Number
- E. Fixed Face at Center Hub

# VISUAL IDENTIFICATION GUIDE DRIVEN PULLEYS



## SERVICING MODEL 330, 780, 910 DRIVE PULLEYS

2-A-1 Use pullers screwed into internal hub threads to remove pulleys from shafts. (figure 2-A-1). See Price List Section, Master Service Manual for list of pullers, application and price. See also, Chapter 1, recommended methods for pulley removal.

Do not use gear pullers on either face or ramp plate, this will cause damage.

Model 780 ramp plate retainer nut is threaded for a puller bolt. Protect crankshaft threads. (figure 2-A-2)

2-A-2 Clean and examine prior to disassembly. Note mounting of ramp plate in relation to hub. If numbers 1 and 2 are stamped on ramp plate, note their position in relation to the hub and roller arm. Replace ramp plate in same position. (figure 2-A-2)

2-A-3 Remove Model 330 ramp plate by knocking out retainer with long drift pin inserted from fixed face end. To replace, position ramp plate on spline and tap retainer with hammer to seat.

Flatten lock plate (figure 2-A-2) and unscrew ramp plate retainer nut of Models 780 and 910. Hold with strap wrench or double pronged tool inserted into vents in ramp plate. Nut has right hand thread and must be extremely tight. See Torque Specifications, Chapter 1. (figure 2-A-2)

2-A-4 Removal of the ramp plate exposes roller arms, springs, pins, bushings. (figure 2-A-3) Clean thoroughly and service as required. Examine roller arms, springs, pins for wear at bearing points, replace if worn. Replace parts in sets as indicated in parts list. Do not mix new and used parts, use sets completely.

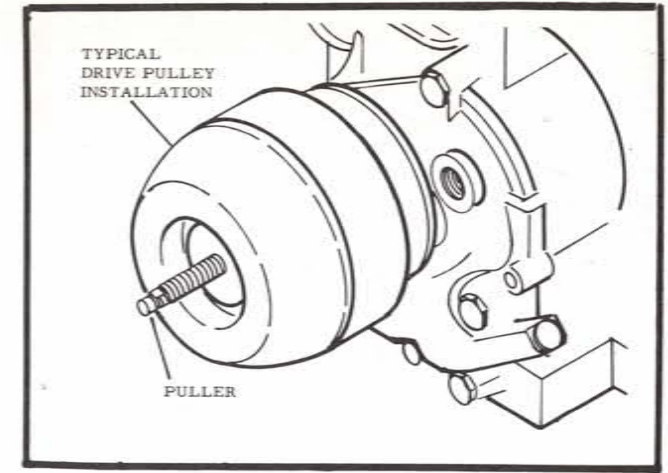


FIGURE 2-A-1

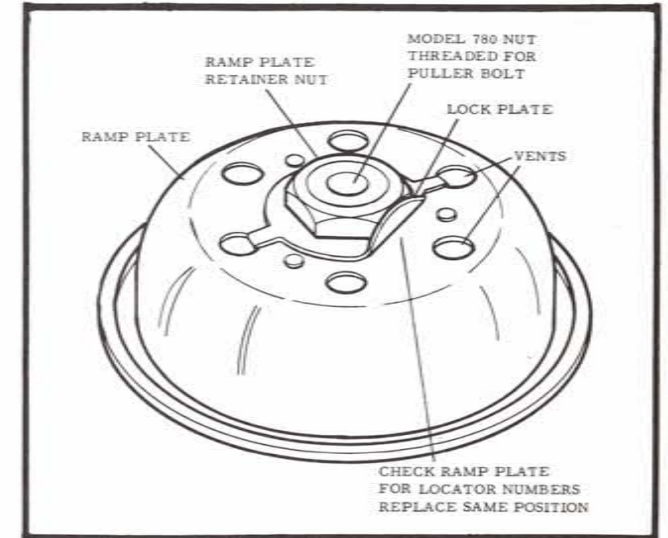


FIGURE 2-A-2

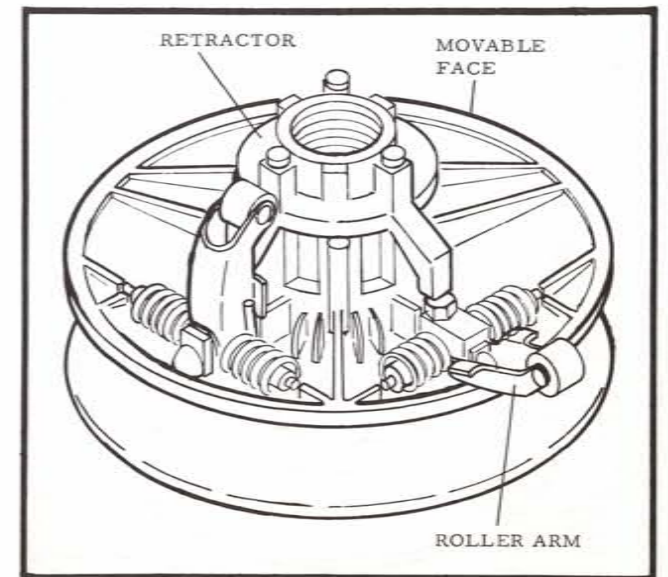


FIGURE 2-A-3

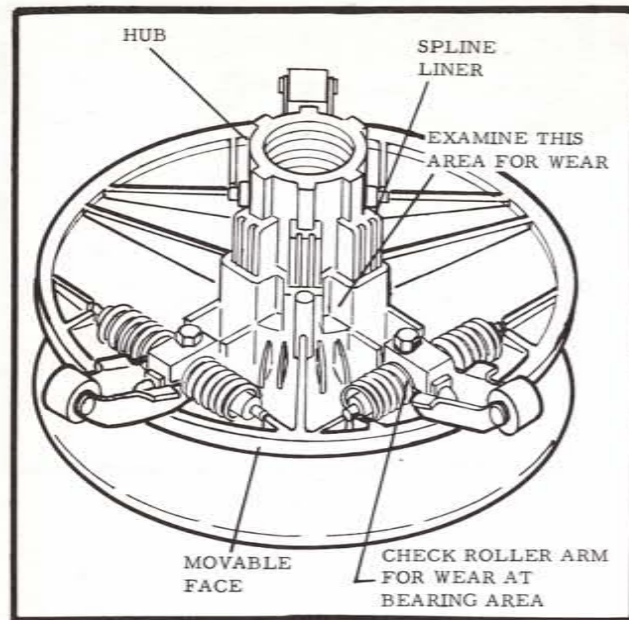


FIGURE 2-A-4

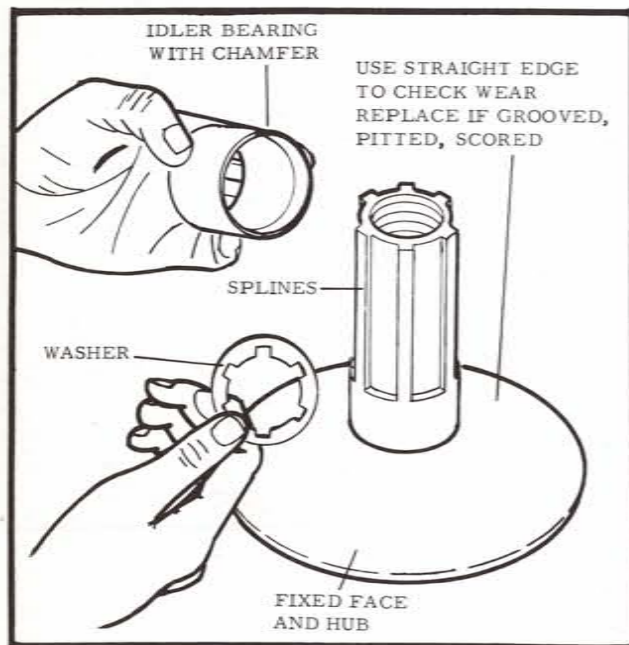


FIGURE 2-A-5

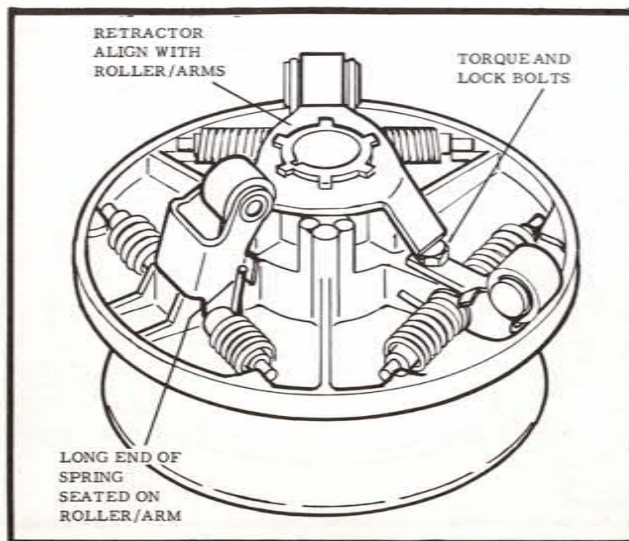


FIGURE 2-A-6

2-A-5 Note position of retractor prior to removing. Ramps of retractor align with roller arms. (figure 2-A-3) When replacing, allow adequate spline length for engagement of ramp plate with hub. (figure 2-A-6)

After releasing springs from roller arms, slide movable face sharply against retractor to remove from hub. (figure 2-A-4)

2-A-6 Examine movable face at spline liners, replace either or both parts to reduce clearance if excessive. (figure 2-A-4)

2-A-7 Clearance is maintained between spline liners and idler bearing by keyed washer. Service as required. (figure 2-A-5)

2-A-8 Examine belt surface of pulley faces, replace if worn, grooved, pitted, scored or other damage. Check for wear by placing straight edge across surface. Replace part if wear is indicated. (figure 2-A-5)

2-A-9 Idler bearing is installed with inside chamfer toward fixed face. Idler bearing is a free turning, close fit on the hub. Replace if excessively worn. Do not use lubrication. Clean idler bearing with dry cloth, do not use solvent.

2-A-10 During assembly torque all bolts and secure with lock plates. See Torque Chart, Chapter 1.

2-A-11 Use tool number 703152 or 703153 for engaging the springs with roller arms.

2-A-12 If drive pulley is installed on a tapered shaft, clean shaft inside taper of pulley before assembly. Tapers must be assembled dry.

2-A-13 See Torque Chart for correct torque for bolt retaining drive pulley to crankshaft. Use a good grade bolt, at least S. A. E. Grade 5 or better. This is indicated by three marks on the head of the bolt.

SERVICING MODEL 500 AND 700 SERIES

2-B-1 Use puller 702807 if hub is threaded. Do not use gear puller on any part of drive pulley to remove from crankshaft. See Chapter 1, General, for instructions for removal of pulleys seized to shaft.

2-B-2 Clean and examine prior to disassembly. Note method of assembly and position of ramp plate prior to disassembly.

NOTE: Hub has two grooves for installation of snap ring. (figures 2-B-1, 2-B-2) Check position prior to disassembly. Use same groove to rebuild. Some models have a spacer between snap ring and ramp plate. See visual identification chart for illustration.

2-B-3 Removal of ramp plate exposes roller arms, springs, pins, bushings. (figure 2-B-3) Clean thoroughly and service as required. Replace all worn parts. Use complete service kits for springs or roller arms. Do not combine new and used parts of the same kind. Any indication of wear requires replacement.

2-B-4 The spider is an interference fit on the hub and it must be tight. Any indication of movement requires replacement.

Spider's position on hub is related to position of snap ring.

If the spider is removed it must be replaced with a new part. Remove only if necessary to replace either movable or fixed face.

Remove spider with gear puller, or heat. The recommended method of heating is with a heat gun.

2-B-5 Examine the movable face. Replace if bushings are worn or other damage is noted. (figure 2-B-3)

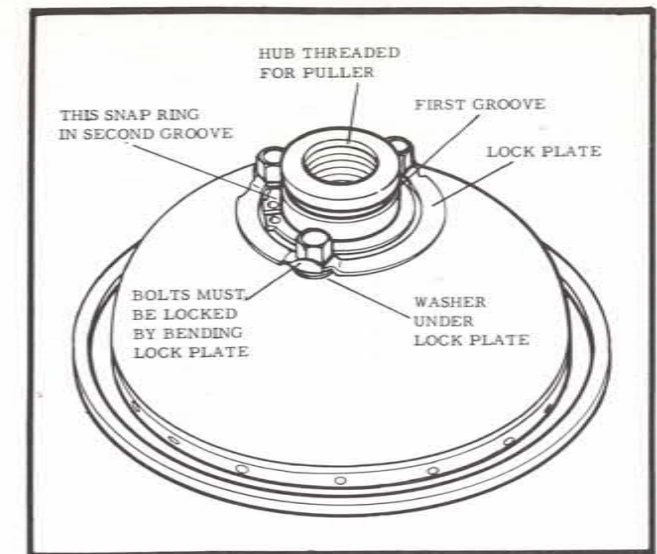


FIGURE 2-B-1

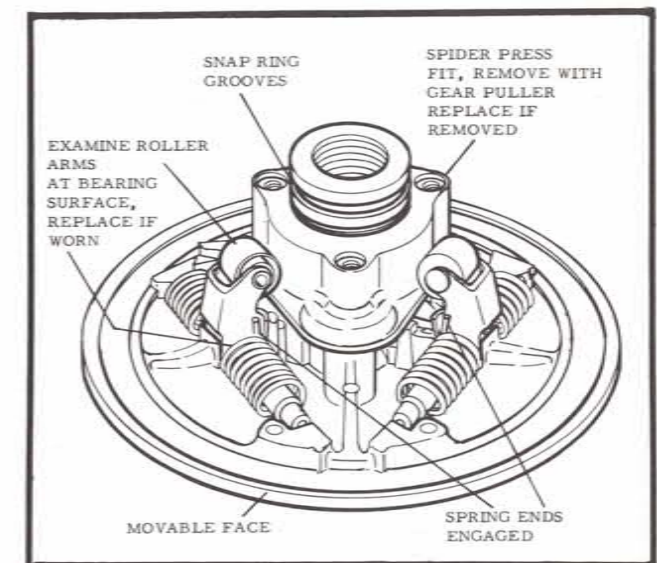


FIGURE 2-B-2

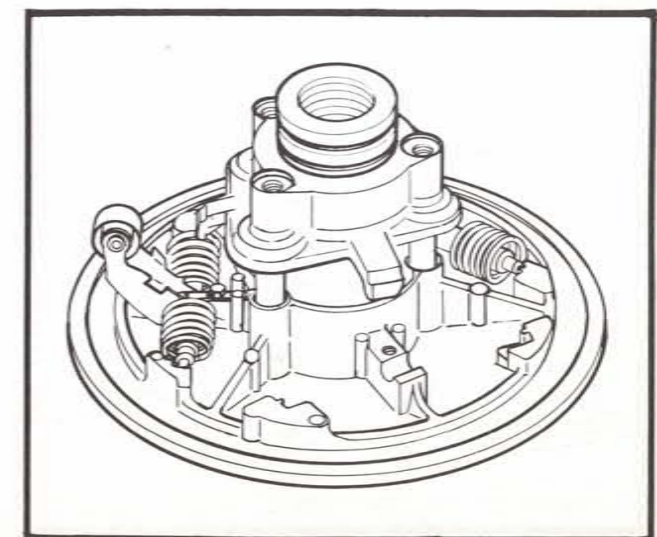


FIGURE 2-B-3



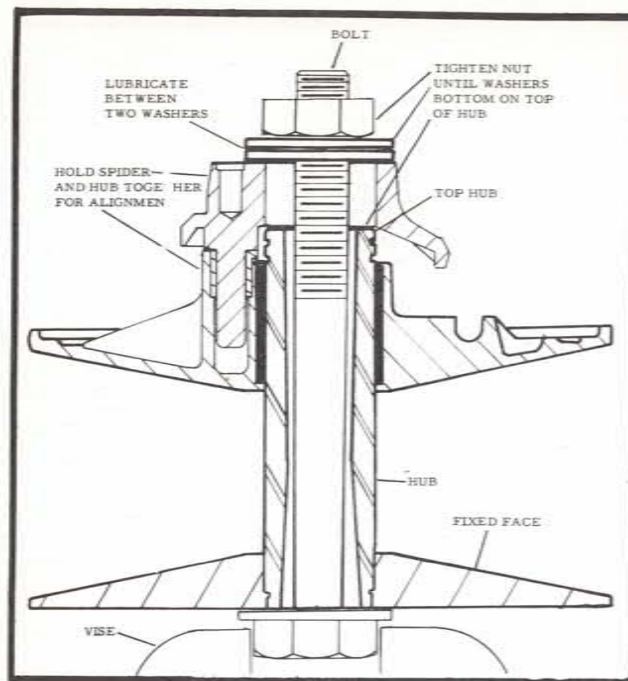


FIGURE 2-B-4

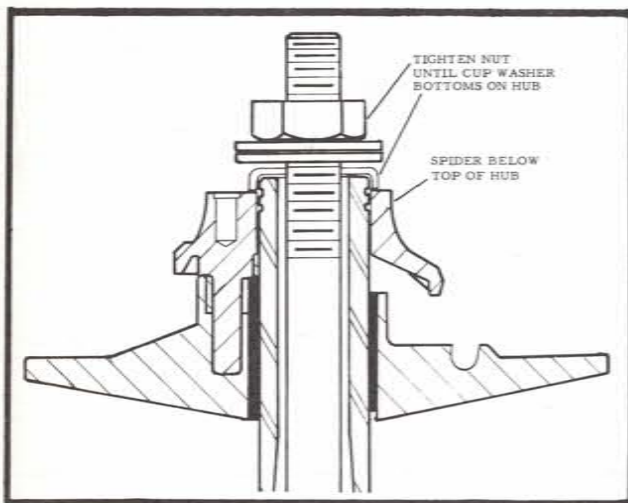


FIGURE 2-B-5

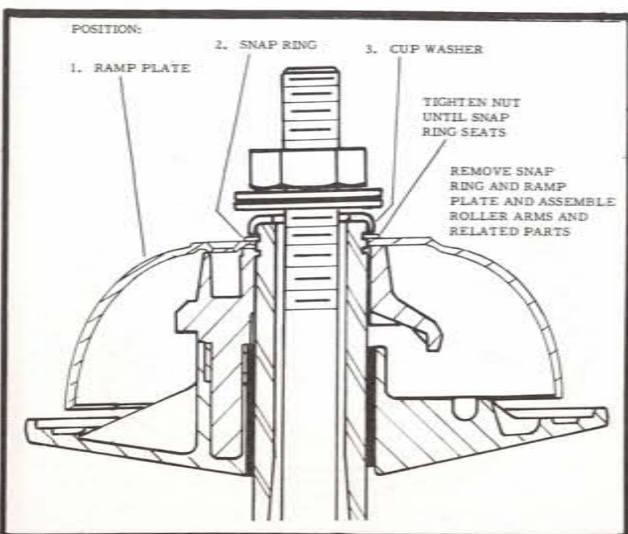


FIGURE 2-B-6

2-B-6 Check the belt surface of both faces with a straight edge. Replace if worn, grooved, or pitted.

2-B-7 During assembly spider must be accurately positioned on the hub. Use a large bolt or 12 inch length of threaded stock, 5/8 inch diameter, two nuts and two washers. Use the cup washer to position the spider. (figures 2-B-4, 2-B-5, 2-B-6) Heat spider to 180 - 250 degrees, press on hot, and dry.

1. Position spider into movable face for alignment and place on hub. Insert threaded stock, washers and nuts. (figure 2-B-4) Tighten nuts until spider flush with top of hub.

2. Remove nut and washer, place proper cup washer centered over hub and retighten until inside of cup washer bottoms on hub. (figure 2-B-6) See Drive Pulley Identifications, Chapter 1, for correct cup washer. Remove washer, nut, and cup washer.

3. Install ramp plate, cup washer, washer and nut. Tighten until cup washer bottomed and remove. (figure 2-B-6)

4. Position ramp plate, snap ring, cup washer, and nut. (figure 2-B-6) Tighten until snap ring locks into groove. Model 780 requires spacer between ramp plate and snap ring. Remove all items: nuts, washers, cup washers, and ramp plate.

5. Movable face must slide freely on hub. Correct binding by lightly tapping spider on top of leg that binds in movable face bushing.

2-B-8 Engage springs with roller arm tool 703152 or 703153. Position ramp plate, snap ring, locking plate and secure with bolts. Torque as required. Washers are placed between ramp plate and lock plate. Bend taps of lock plate to secure bolts.

2-B-9 If drive pulley is installed on a tapered shaft, clean shaft and inside taper of pulley before assembly. Tapers must be dry.

See torque chart for correct torque for bolt retaining drive pulley to crankshaft.

Use a good grade bolt, at least S. A. E. Grade 5 or better. This is indicated by three marks on the head of the bolt.

SERVICING PROCEDURE  
1190 AND 1195 DRIVE PULLEY

2-C-1 Use puller number 702926 to remove from crankshaft.

Clean and examine the drive pulley for external damage.

2-C-2 These instructions apply to all models of the 1190 and 1195 drive pulleys. Model variations are identified by rivet or castellated nuts on the ramp plate. (figure 2-C-1)

2-C-3 Ramp plates are pressed on the splined hub. Do not remove the three castellated nuts. Use three or four evenly spaced 2 X 4 wood blocks to support the outer edge of the ramp plate raising the fixed face approximately 1/2 inch off the bed of an arbor press. Screw in the removal tool, 702926 and apply pressure to separate the ramp plate from the hub. (figure 2-C-1)

Examine the ramp plate. Replace the ramp plate if riveted torque pins are loose. Torque pins retained with nut are replaceable in sets.

2-C-4 Alignment of replacement torque pins is important. Start in ramp plate finger tight. Place movable face and ramp plate on hub with torque pins in guide bushings in movable face, tighten nuts and lock with cotter key if used. Torque nuts to 20 - 25 foot pounds. With springs disconnected from roller arms movable face should slide freely on hub.

2-C-5 Support the center of the hub when pressing on the ramp plate. Do not support on the outer edge of the fixed face. Use cup washer 703135 to press ramp plate on hub to correct position. (figure 2-C-2)

Cup washer 703135 must be used when securing drive pulley to crankshaft of driving shaft. Cup washer secures the ramp plate to the hub. (figure 2-C-2)

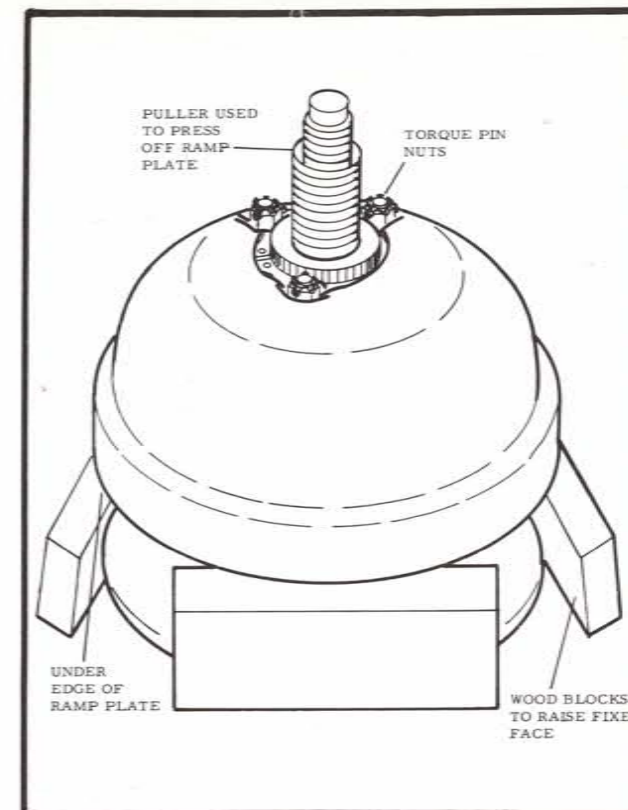


FIGURE 2-C-1

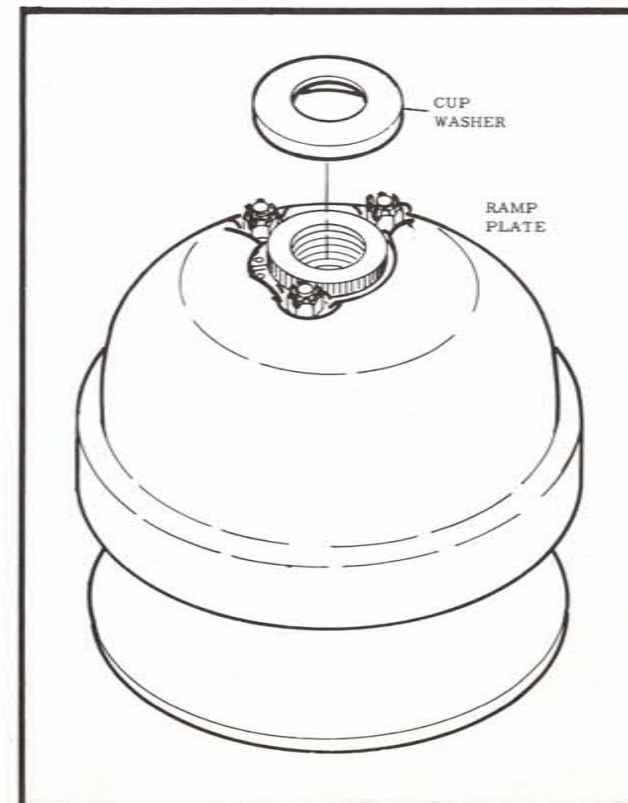


FIGURE 2-C-2

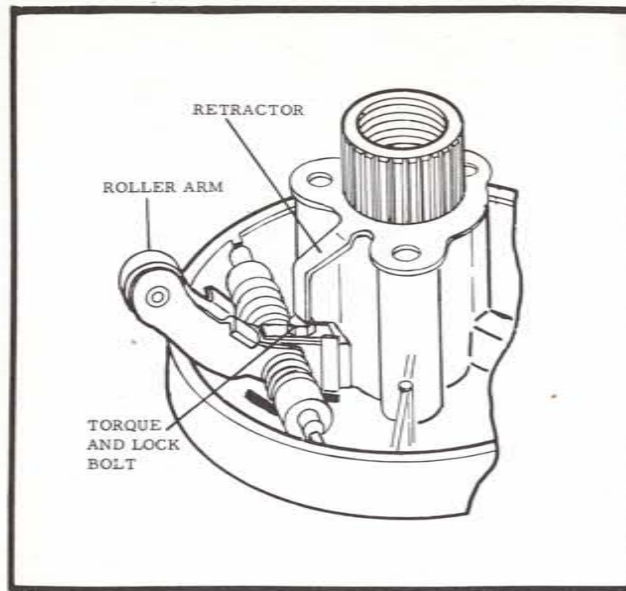


FIGURE 2-C-3

2-C-6 Remove roller arms, springs, pins, and bushings from movable face. Clean and examine. Replace if wear is found on springs, pins, roller arms, figure 2-C-3. Replace in sets as indicated on parts list. Use set of parts compete as received, do not combine new and used parts. Torque retainer bolts, bend up lock plate to secure bolt.

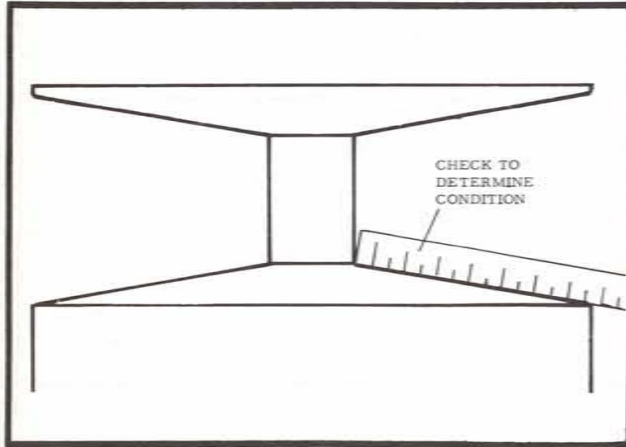


FIGURE 2-C-4

2-C-7 Examine the fixed and movable faces for wear on the belt surface. Replace if worn, scored, and pitted. (figure 2-C-4) Place a straight edge across the drive surface of the pulley faces to check for excessive grooving.

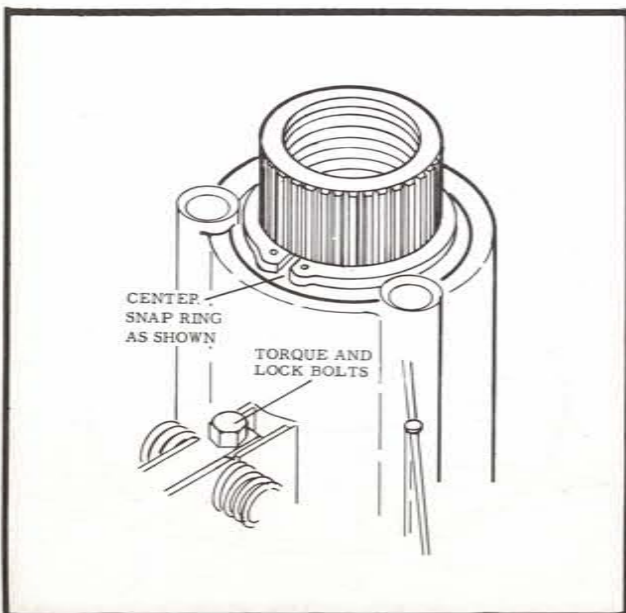


FIGURE 2-C-5

2-C-8 Position movable face to prevent binding with snap ring. Center snap ring ends between torque pin bushings. (figure 2-C-5)

SERVICING MODEL 880 DRIVE PULLEY

2-D-1 Use puller 702925 to remove drive pulley from crankshaft. Clean and examine.

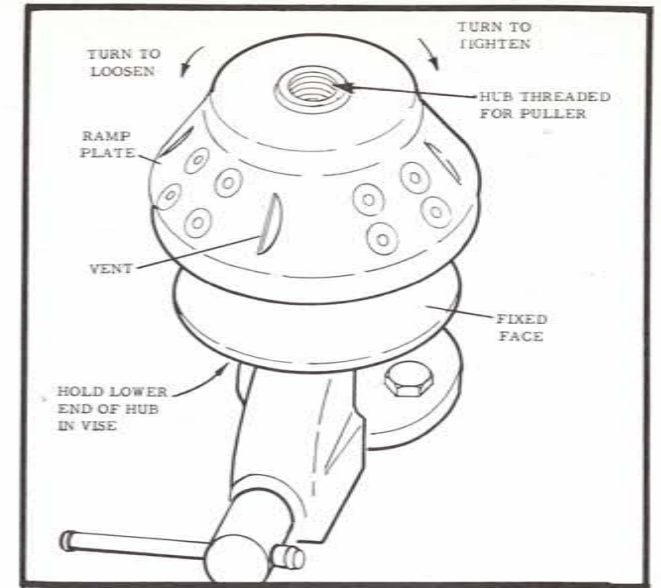


FIGURE 2-D-1

2-D-2 Disassemble by unscrewing ramp plate from fixed face. Clamp center hub protruding beyond fixed face in vise. (figure 2-D-1) Use strap wrench. Turn ramp plate counter clockwise.

2-D-3 Lift off ramp plate and movable face. Note position of spring, spring cup, thrust washers, and idler tire. All parts must have free fit, replace if excessively loose. (figure 2-D-2)

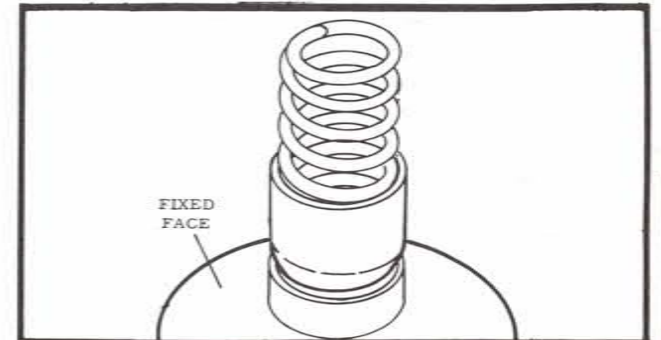


FIGURE 2-D-2

2-D-4 Examine the levers, they must pivot freely but not have side play. Replace lever and pivot pin if worn. Replace ramp plate if lever guides are worn. (figure 2-D-4)

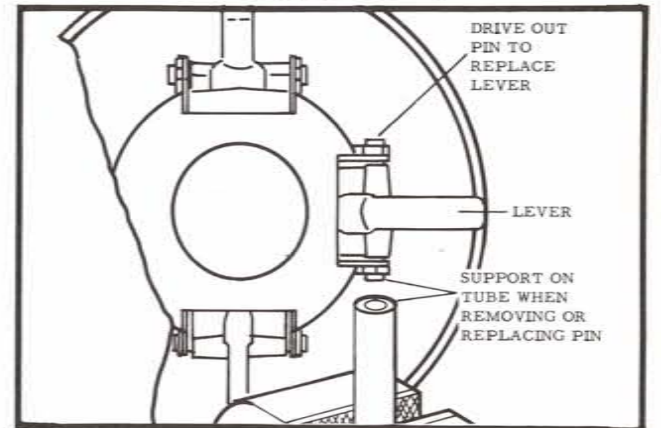


FIGURE 2-D-3

2-D-5 Position lever bracket on tubular support and drive out pivot pin with hammer and drift. Replace pin by supporting in same manner.

2-D-6 Assemble idler tire bushing spring cup and spring on fixed face clamped in vise. Place movable face into ramp plate so that levers seat into inserts in ramp plate. (figure 2-D-4) Hold movable face and ramp plate together as assembly and screw onto fixed face hub. Turn clockwise. Use strap wrench to tighten.

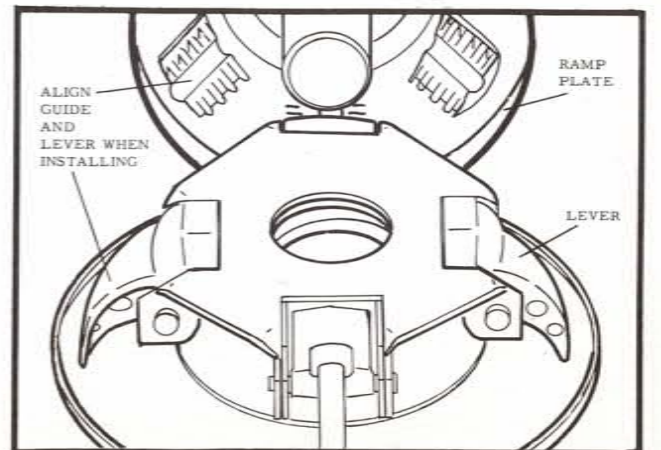


FIGURE 2-D-4

2-D-7 Use a good grade fastener to retain pulley to crankshaft. At least Grade 5 or better, indicated by three marks on bolt head.

SERVICING SPEED SENSITIVE  
DRIVEN PULLEYS

3-A-1 Examine the pulley and determine if spring cups are restricted in movement by links. View from edge of pulley. (figures 3-A-1, 3-A-4)

If pulley has links, flatten lock tabs on nuts and remove cover. (figure 3-A-1)

If pulley does not have links, do not remove nuts until spring tension secured with tool. (figures 3-A-4, 3-A-6)

3-A-2 Use at least a 12 inch length of threaded stock, two nuts and washers. A drive pulley spider is also used to compress the spring below the center hub. (figures 3-A-2, 3-A-6)

3-A-3 After positioning the tools and pulley, compress spring to release links or nuts. (figures 3-A-2, 3-A-6) Turn nut to release spring tension. (figure 3-A-3)

3-A-4 Clean all parts and replace if worn. Examine bushings for wear.

3-A-5 Position parts and tools, align bolt holes and link seats. (figures 3-A-3, 3-A-5)

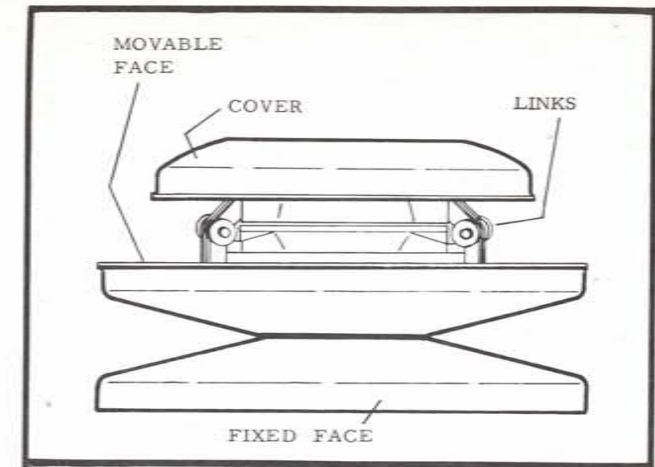


FIGURE 3-A-1

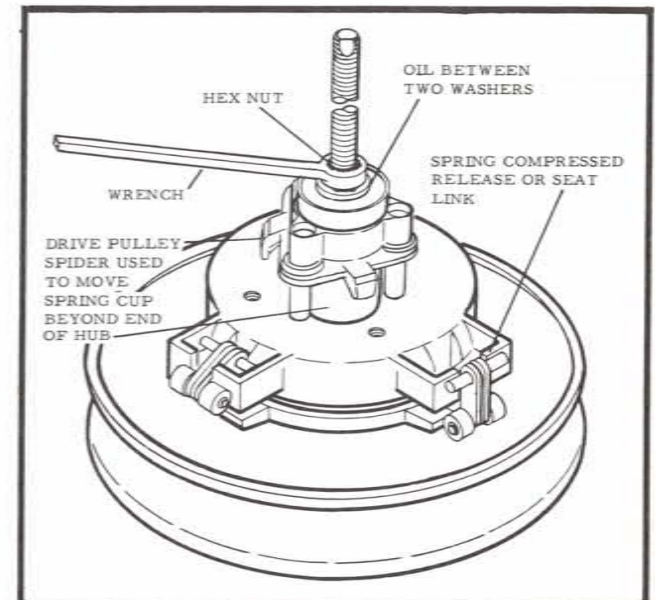


FIGURE 3-A-2

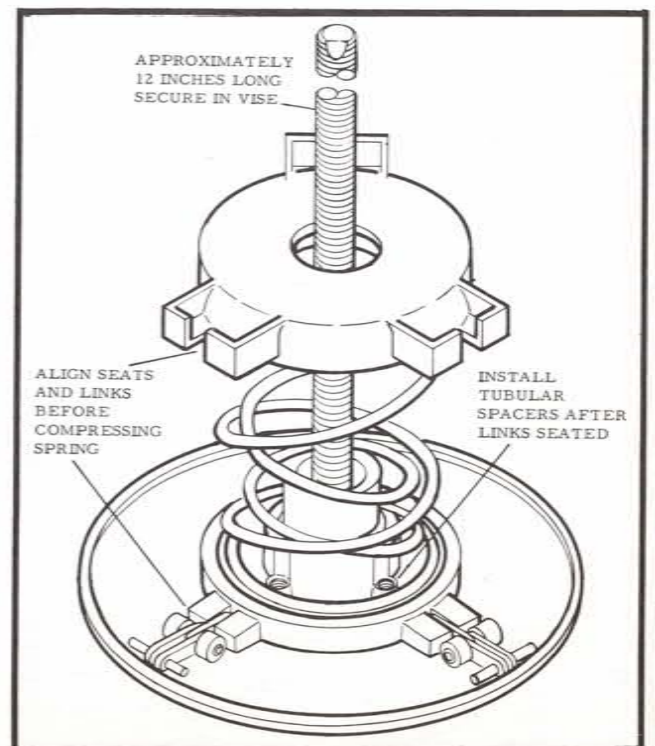


FIGURE 3-A-3

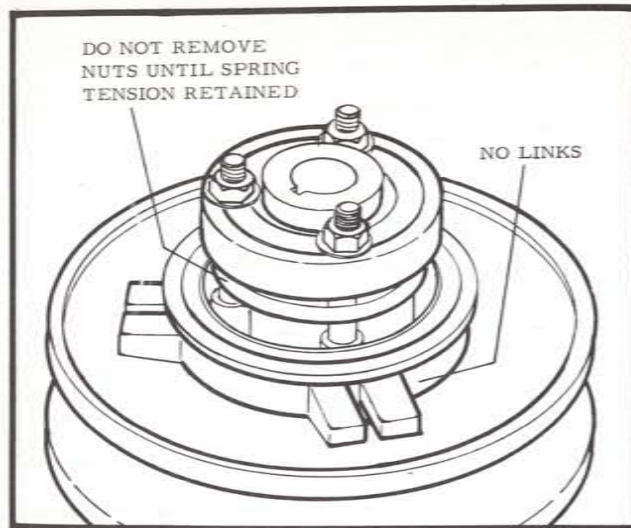


FIGURE 3-A-4

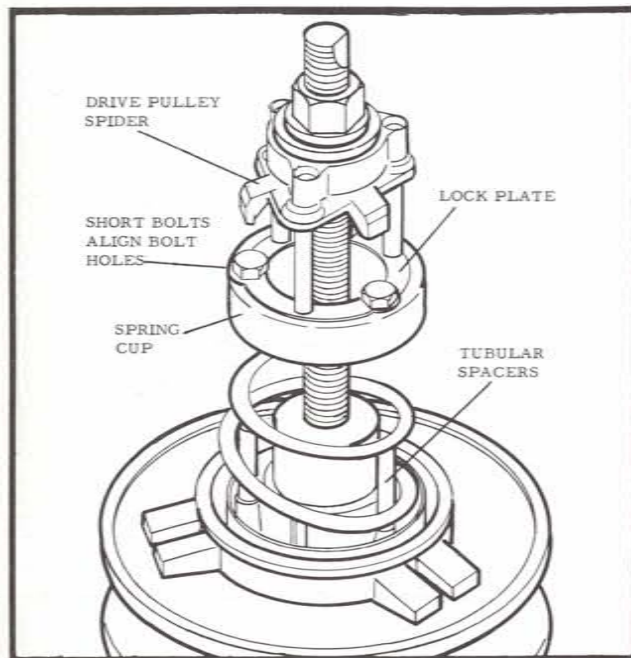


FIGURE 3-A-5

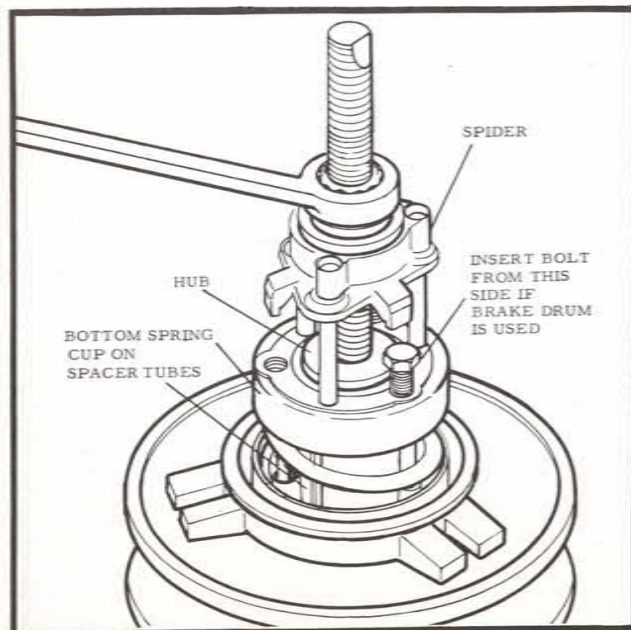


FIGURE 3-A-6

**SERVICE HINT:** Place short bolts in locking plate, figures 3-A-5, 3-A-6 to maintain bolt hole alignment in lock plate and spring cup.

3-A-6 Link type, compress spring completely (figure 3-A-2) seat link pins. Release assembly from tool, slide movable face off hub, position tube spacers in movable face, place on hub and secure with nuts. Nuts must be locked with lock plate.

3-A-7 Bolts are inserted from the spring end of both units when equipped with brake drums. Nut lock plate is the brake drum. Modify disassembly and assembly procedures to suit.

3-A-8 Driven pulleys with integral shafts will require use of arbor press and tubular adapters. Follow procedures beginning with paragraph 3-A-1, modify for integral shaft.

### SERVICING TORQUE SENSITIVE DRIVEN PULLEYS

3-B-1 Clean thoroughly before disassembly. Examine for wear and operation. Replace worn parts. Note position of spring anchor points.

3-B-2 Release spring from anchor in torque bracket. (figure 3-B-1) Unhook with screwdriver.

3-B-3 Place on bench, fixed face down, position heels of hands on torque bracket. Press down to clear key in hub and turn to lock under key. (figure 3-B-2)

3-B-4 Remove snap ring. Turn torque bracket slowly to release and slide up hub. Hold securely to prevent sudden spring release. Model 330 (figure 3-B-1) Hold torque bracket while removing socket head screws, Carefully release spring tension.

3-B-5 Clean and examine all parts, replace if worn. Do not lubricate during reassembly.

3-B-6 Place movable face on hub; replace key. Engage spring with anchor point in torque bracket, paragraph 3-B-2, and anchor point in movable face.

Compress spring until 1/16 to 1/8 inch clearance between ramps. (figure 3-B-3) Turn movable face 1/3 turn counter clockwise, or 120 degrees, press torque bracket down hub and lock under key, paragraph 3-B-3. Replace snap ring. Release torque bracket to seat against snap ring.

Some models have ramp shoe in movable face portion of torque bracket. Service in same manner.

3-B-7 Drive pulleys with integral shafts are serviced in the same manner. Some models use a circle type retainer rather than a snap ring.

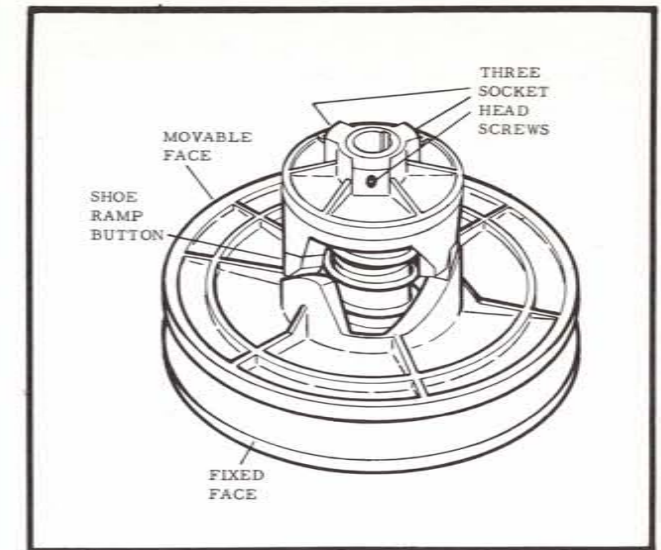


FIGURE 3-B-1

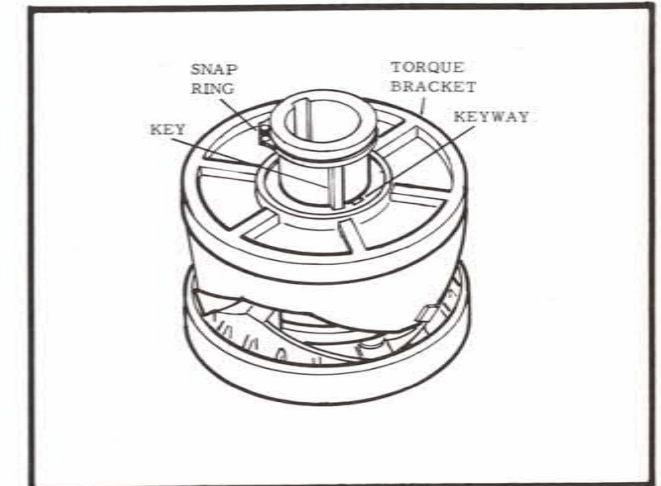


FIGURE 3-B-2

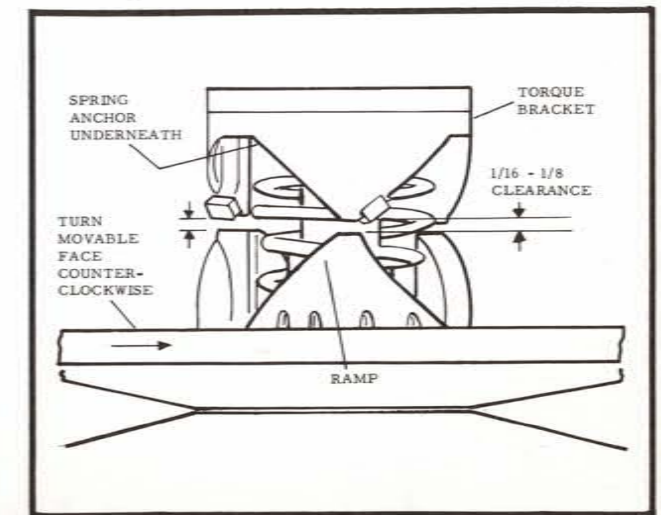


FIGURE 3-B-3

4-A-1 Belts are a very important part of the overall design of the Salisbury Torque Converter. Use only the specified belt for each application. (figures 1, 2, 3) A change in shaft center dis-

tance will also have the same affect as a loose or tight belt. (figures 2, 3) See Master Service Manual, Belts Section, for recommended belts and dimensions.

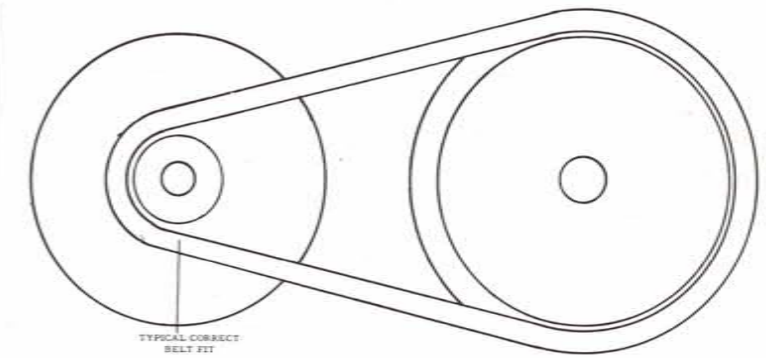
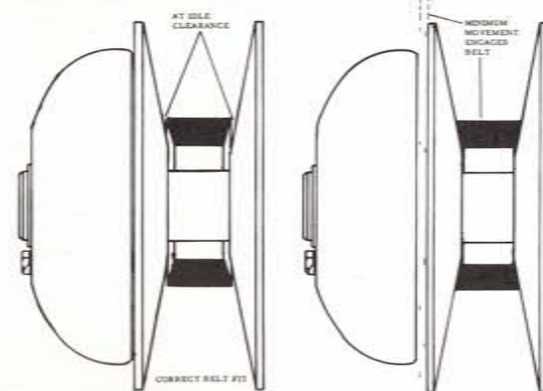


FIGURE 4-A-1 Correct Belt Size

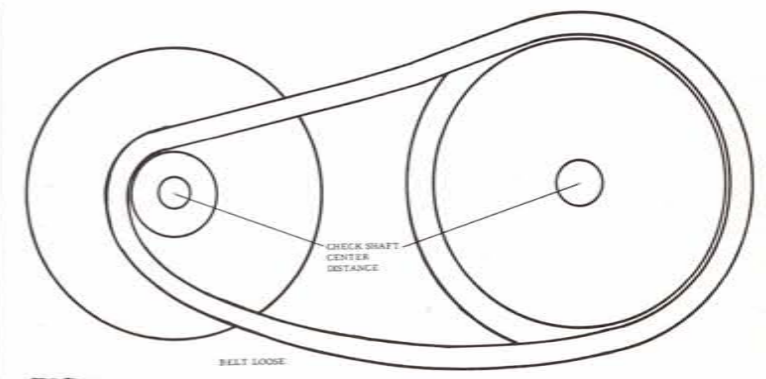
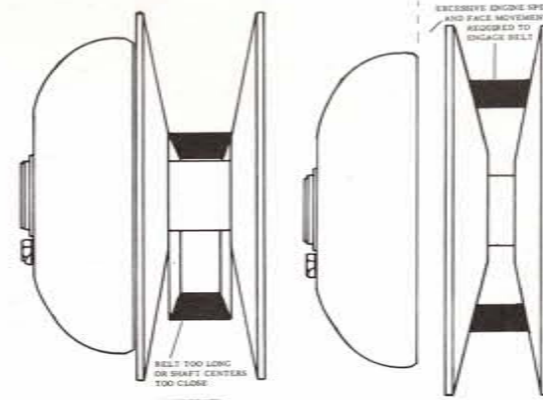


FIGURE 4-A-2 Loose Belt

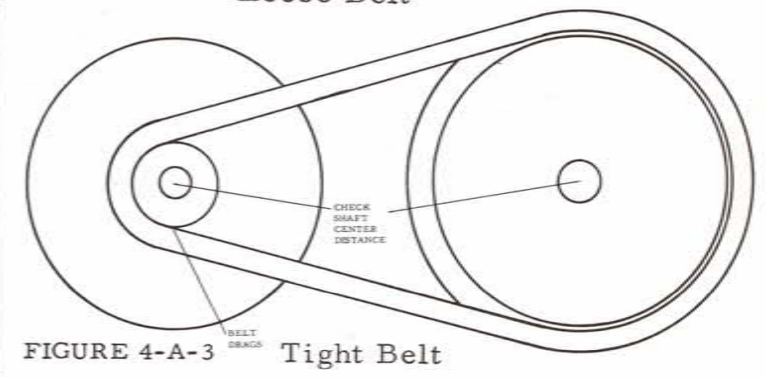
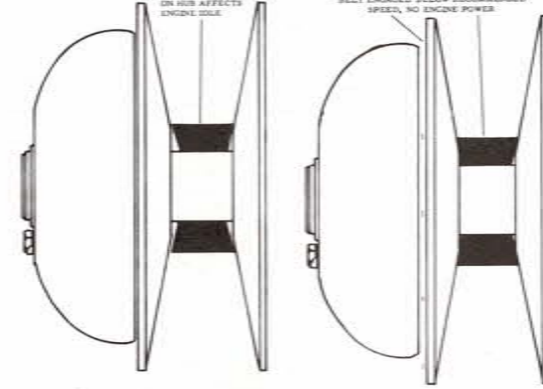


FIGURE 4-A-3 Tight Belt

4-A-2 Belts that are excessively worn will require a higher engine speed for engagement and the maximum ground speed of the vehicle will be reduced. (figure 4) The serviceable belt moves to the outer diameter resulting in a "high gear" ratio. (Upper solid belt, figures 4a and

4b). Figure 4b illustrates maximum travel of the movable face, worn belt, (hollow, lower) unable to move to greatest diameter of drive pulley. Vehicle performance is also affected if belts are coated with grease, oil or water.

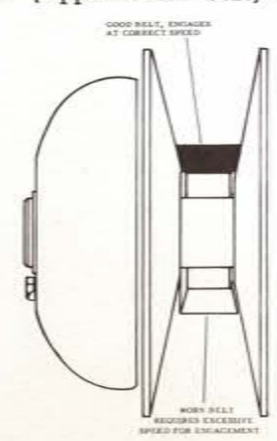


FIGURE 4-A-4

**SERVICE NOTES:**

**SERVICE NOTES:**

