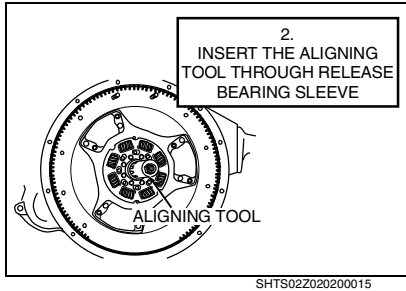
**IMPORTANT POINT - MOUNTING**

1. INSERT TWO (2) 3/8" x 16 UNC x 3" (76 MM) LONG GUIDE STUDS INTO THE TWO UPPER MOUNTING HOLES OF THE FLYWHEEL.



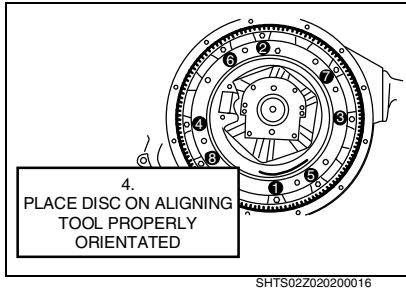
2. INSTALL THE DISC BY INSERTING THE ALIGNING TOOL THROUGH THE DISC SPLINES AND THEN INTO THE PILOT BEARING.

SST: Clutch Aligning Arbor (S0966-21410)

**NOTICE**

Make sure the side marked "Pressure Plate Side" faces the pressure plate.

3. WITH THE ALIGNING TOOL STILL IN PLACE, CAREFULLY SLIDE THE CLUTCH ASSEMBLY OVER THE ALIGNING TOOL AND THE TWO (2) GUIDE STUDS WITH THE KWIK-ADJUST ALIGNED WITH THE ACCESS HOLE IN THE BELL HOUSING.



4. INSTALL LOCKWASHER AND SIX (6) 3/8" x 16 UNC GRADE 5 OR BETTER MOUNTING BOLTS AND HAND TIGHTEN.

- (1) Remove the two (2) guide studs and replace with the remaining mounting bolts with lockwasher. Using a torque wrench, progressively tighten the eight (8) mounting bolts using the following crisis-cross pattern. Starting at lower left.

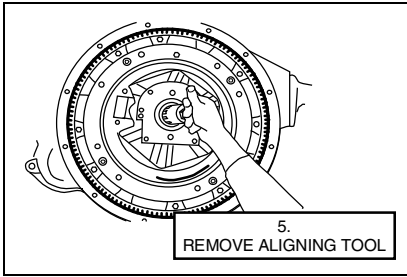
Remove the shipping blocks from between the release bearing and the cover assembly.

**Tightening Torque:**  
50-64 N·m{510-665 kgf·cm, 37-47 lbf·ft}

**⚠ CAUTION**

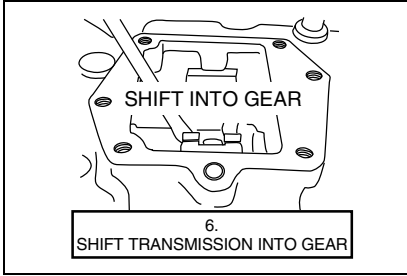
Failure to tighten these bolts in this manner can:

- Prevent the clutch cover from "centering" into the pilot area of the flywheel.
- Cause permanent damage to the clutch cover (i.e. become cracked or broken).
- Cause the clutch assembly to be out-of balance with the flywheel.



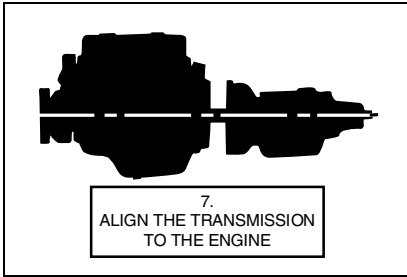
SHTS02Z020200017

5. REMOVE THE ALIGNING TOOL.



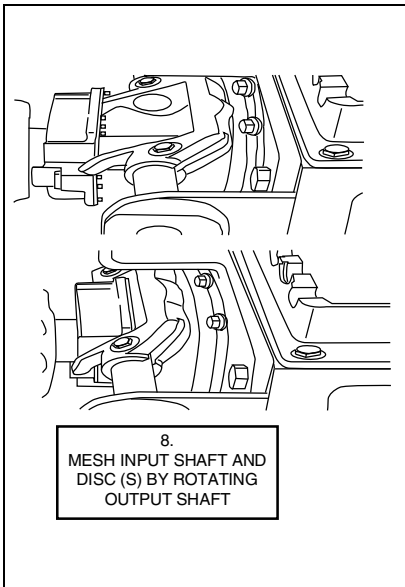
SHTS02Z020200018

6. SHIFT THE TRANSMISSION INTO GEAR.



SHTS02Z020200019

7. POSITION THE TRANSMISSION SO THAT IT IS BOTH SQUARE TO AND ALIGNED WITH THE ENGINE.



8. WHILE MOVING THE TRANSMISSION FORWARD, ROTATE THE OUTPUT SHAFT OF THE TRANSMISSION UNTIL THE SPLINES OF BOTH THE INPUT SHAFT AND THE DISC(S) MESH WITH EACH OTHER. WHILE PERFORMING THIS TASK, YOU MUST ALSO ENSURE THAT THE YOKE FINGERS REMAIN IN THE UP POSITION UNTIL THEY CAN BE ROTATED OVER THE RELEASE BEARING HOUSING INTO THEIR FINAL POSITION.

**⚠ CAUTION**

- Do not use the cross-shaft release lever (or a pipe over it) to pull the transmission into its final position.
- Do not excessively force the transmission into the clutch assembly or engine housing. If it does not enter freely, investigate the cause of the problem and make any necessary changes.
- If the input shaft will not slide into the discs, they may need to be repositioned. Do not let the transmission drop or hang unsupported in the driven discs.  
This can cause the discs to become distorted and the clutch will not release.

9. INSTALL THE TRANSMISSION MOUNTING BOLTS AND TORQUE TO THE PROPER SPECIFICATION.

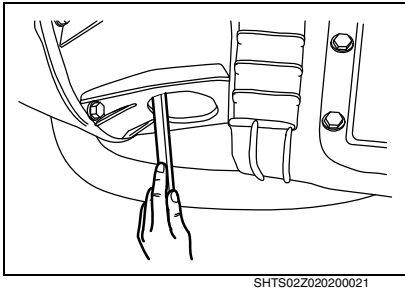
Tightening Torque:

37.5-48.5 N·m{382-494 kgf·cm, 28-35 lbf·ft}

### IMPORTANT POINT - ADJUSTMENT

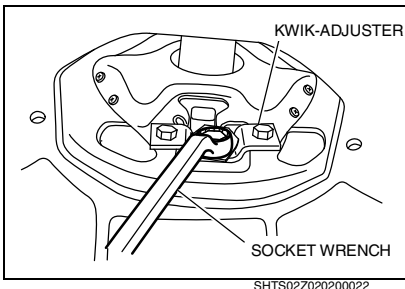
1. CHECK LOCATION OF THE KWIK-ADJUSTER®

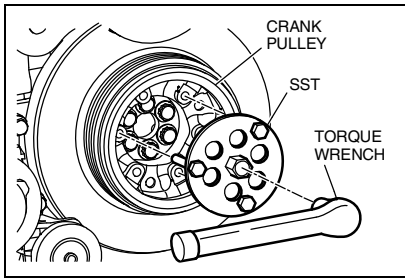
(1) Remove the cover of inspection hole at the bottom of the clutch housing.



(2) If the Kwik-Adjuster exists in approachable position, adjustment can be performed.

If position of the Kwik-Adjuster cannot be identified, perform following procedure.





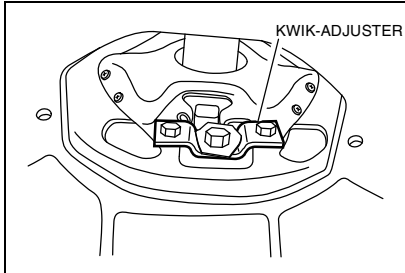
SHTS02Z020200023

## 2. ARRANGE THE KWIK-ADJUSTER

- (1) Set SST the crank pulley.

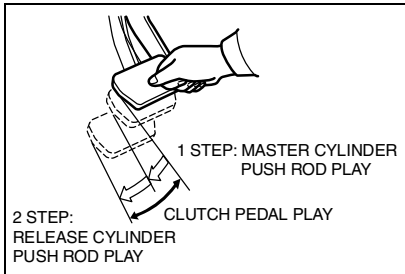
**SST:**

**Cranking Tool (S0940-91200)**



SHTS02Z020200024

- (2) Turn the crank pulley till the Kwik-Adjuster matches the inspection hole.



SHTS02Z020200025

## 3. ADJUSTING PROCEDURES

- (1) Adjust the release bearing position;

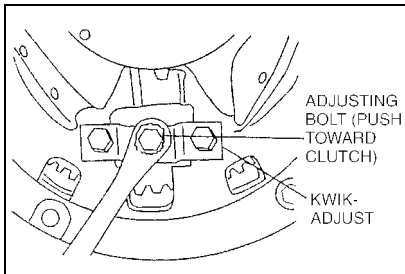
- When the clutch disc is worn (pedal play less than limit)  
**Pedal play limit: 35 mm {1.38 in.}**
- When the clutch disc replaced.

- (2) Adjust the free travel by release cylinder push rod only;

- When the clutch disc or control linkage is replaced.

### NOTICE

The above adjusting should be made after adjusting the release bearing position.



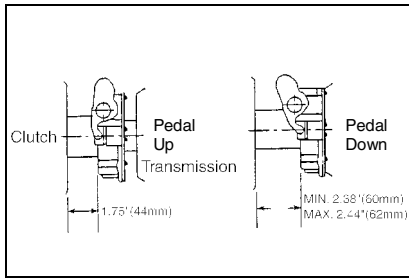
SHTS02Z020200026

- (3) Manual Adjust: Kwik-Adjust®

- Depress adjusting bolt and rotate.  
Kwik-Adjust will re-engage at 1/3 of a turn.

### NOTICE

- **Open-end wrenches are not recommended.**
- **Internal adjustments are performed with pedal down (clutch released).**



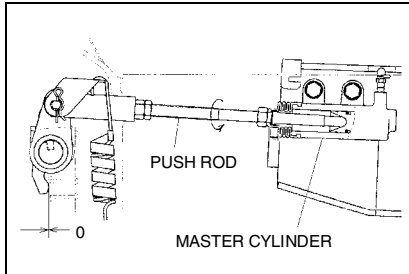
SHTS02Z020200027

#### 4. ADJUST THE RELEASE BEARING POSITION

- (1) Set 1.75" (44 mm) dimension: With pedal down, turn adjusting ring to obtain approximately 1.75" (44 mm). Turning the adjusting ring clockwise moves the release bearing toward the transmission. Turning the adjusting ring counterclockwise moves the release bearing toward the engine.
- (2) Check release travel dimensions with release yoke rotated toward release bearing, eliminating excess play in system. Having set this, depress pedal down fully releasing clutch and check release travel to settings shown.

#### NOTICE

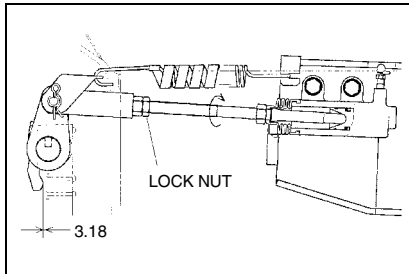
**It may be necessary to reduce the 1.75" (44 mm) settings to be able to achieve 0.500"-0.562" (13-14 mm) travel on some models of transmissions.**



SHTS02Z020200028

#### 5. ADJUST THE FREE TRAVEL

- (1) Remove the return spring.
- (2) Loosen the lock nut and turn the push rod counterclockwise until the release bearing contacts the release lever plate or release lever.



SHTS02Z020200029

- (3) Turn the push rod clockwise about 3 1/3 turns.

**Standard: Clearance between release bearing and release yoke: 3.18 mm {0.125 in.}**

- (4) Tighten the lock nut.

# CLUTCH ASSEMBLY (EATON SOLO1401)

## DATA AND SPECIFICATIONS

EN02Z02021200002

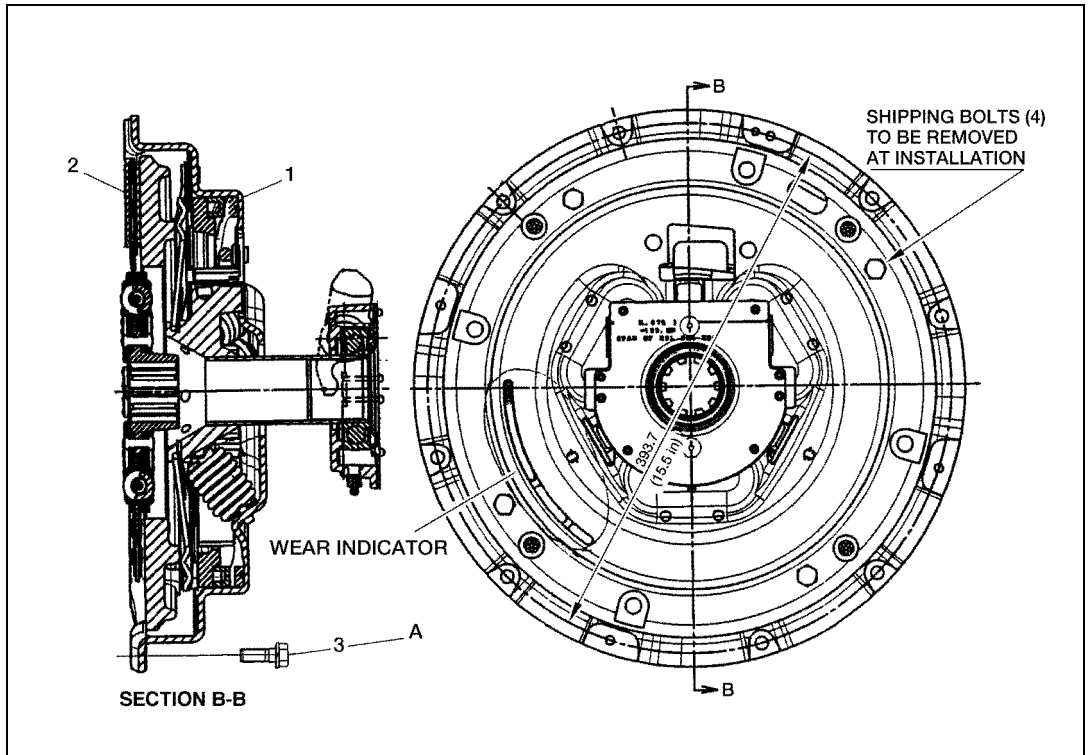
### CLUTCH FACING

Unit: mm {in.}

Material	Sintered metal (Ceramic metal)
Type	Dry single plate with damper spring
Inside diameter	222 {8.8}
Outside diameter	350 {13.8}
Thickness	11.5 {0.45} Adjustment-Free

## COMPONENT LOCATOR

EN02Z0202D100002



SHTS02Z0202000030

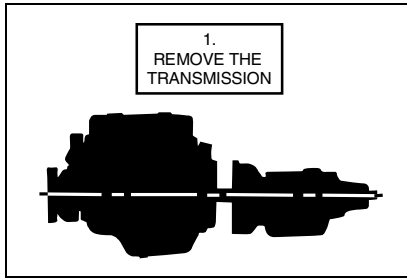
1 Clutch cover	3 Bolt
2 Clutch disc	

Tightening torque	Unit: N·m {kgf·cm, lbf·ft}
A 50-64 {510-655, 37-47}	

## OVERHAUL

EN02Z0202H200002

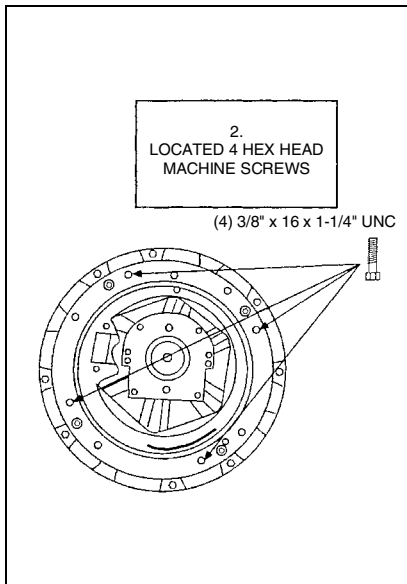
### IMPORTANT POINT - DISMOUNTING



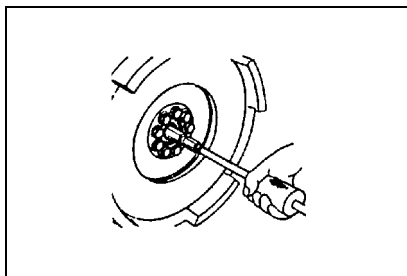
1. REMOVE THE TRANSMISSION, SUPPORTING ITS WEIGHT TO PREVENT DAMAGE TO THE BEARING AND DISCS.

#### NOTICE

If a SOLO Clutch is to be removed and reinstalled on the flywheel, four (4) shipping bolts must be installed prior to unbolting the clutch (3/8" x 16 UNC x 1-1/4").



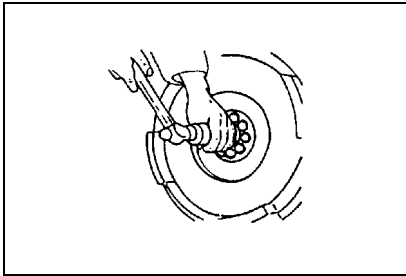
2. LOCATE FOUR (4) 3/8" x 16 UNC x 1 - 1/4", HEX HEAD MACHINE SCREWS. INSTALL THEM IN THE 4 COVER HOLES, TURNING THEM ONE COMPLETE TURN AFTER THEY CONTACT THE COVER.
3. REMOVE THE CLUTCH FROM THE FLYWHEEL.



### IMPORTANT POINT - INSPECTION AND REPLACEMENT

1. REPLACE THE PILOT BEARING.
  - (1) Remove the pilot bearing.

**SST:**  
**Pilot Bearing Puller (S0965-01970)**  
**Sliding Hammer (S0942-01442)**

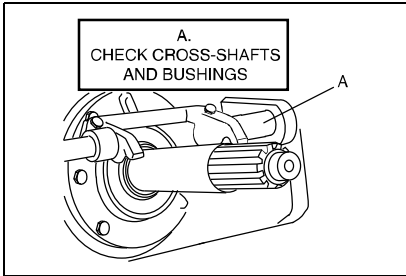


SHTS02Z020200034

- (2) Using a suitable tapping rod, install the pilot bearing.

**NOTICE**

After installing the pilot bearing, ensure that it rotates smoothly.



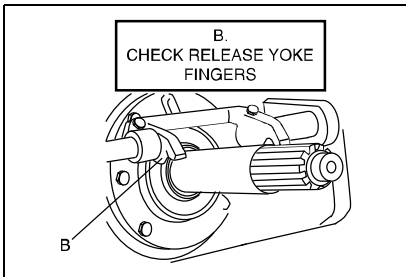
SHTS02Z020200035

**2. CHECK THE FOLLOWING ITEMS FOR WEAR REPLACE ANY WORN COMPONENTS.**

- (1) Cross-shafts and bushings

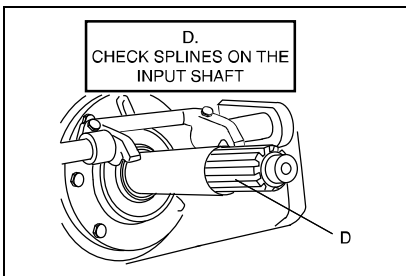
**NOTICE**

Excessive wear at these points can cause a side loading condition. Also, inspect the remaining pivot points of the linkage for excessive wear.



SHTS02Z020200036

- (2) Release yoke fingers



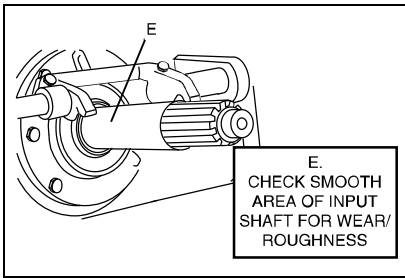
SHTS02Z020200037

- (3) Splines on the input shaft

**NOTICE**

Any wear on the splines will prevent the newly installed driven discs from sliding freely, thus causing poor release (clutch drag). Select a disc out of the new installation and slide it full length on the transmission splines. This will detect a twisted input shaft. Replace input shaft if disc does not freely slide.





SHTS02Z020200038

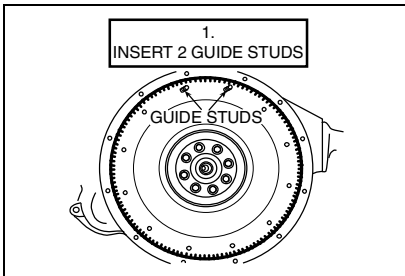
(4) Smooth area of input shaft

(5) Mating surfaces

**NOTICE**

Inspect the mating surfaces of both the transmission bell housing and the flywheel housing. Any appreciable wear on either housing will cause misalignment. Most wear will occur between the 3 and 8 o'clock positions.

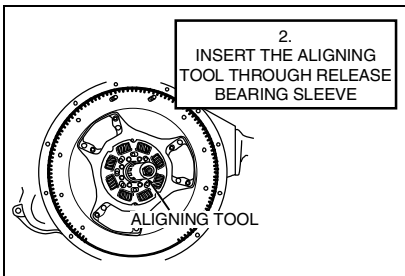
Replace housings if worn.



SHTS02Z020200039

**IMPORTANT POINT - MOUNTING**

1. INSERT TWO (2) 3/8" x 16 UNC x 3" (76 MM) LONG GUIDE STUDS INTO THE TWO UPPER MOUNTING HOLES OF THE FLYWHEEL.



SHTS02Z020200040

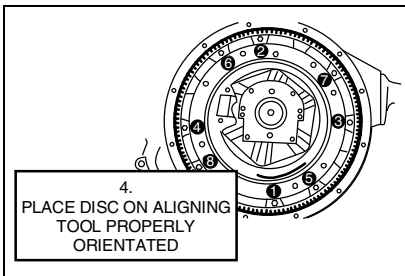
2. INSTALL THE DISC BY INSERTING THE ALIGNING TOOL THROUGH THE DISC SPLINES AND THEN INTO THE PILOT BEARING.

SST: Clutch Aligning Arbor (S0966-21410)

**NOTICE**

Make sure the side marked "Pressure Plate Side" faces the pressure plate.

3. WITH THE ALIGNING TOOL STILL IN PLACE, CAREFULLY SLIDE THE CLUTCH ASSEMBLY OVER THE ALIGNING TOOL AND THE TWO (2) GUIDE STUDS.



SHTS02Z020200041

4. INSTALL LOCKWASHER AND SIX (6) 3/8" x 16 UNC MOUNTING BOLTS HAND TIGHTEN.

- (1) Remove the two (2) guide studs and replace with the remaining mounting bolts with lockwasher. Using a torque wrench, progressively tighten the eight (8) mounting bolts using the following crisis-cross pattern. Starting at lower left.

**Tightening Torque:**

50-64 N·m(510-665 kgf·cm, 37-47 lbf·ft)

**⚠ CAUTION**

Failure to tighten these bolts in this manner can:

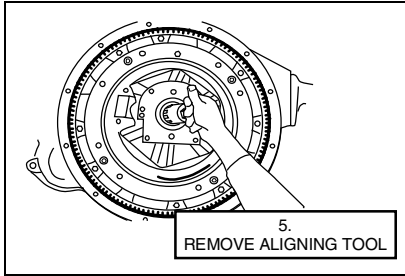
- Prevent the clutch cover from "centering" into the pilot area of the flywheel.
- Cause permanent damage to the clutch cover (i.e. become cracked or broken).
- Cause the clutch assembly to be out-of balance with the flywheel.

- (2) Remove the four (4) gold colored shipping bolts in a criss-cross pattern.

**NOTICE**

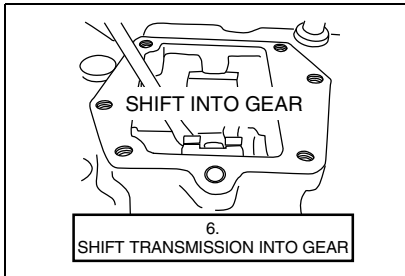
**Save these four (4) bolts for future use in case you need to remove, then reinstall the SOLO Clutch.**

5. REMOVE THE ALIGNING TOOL.



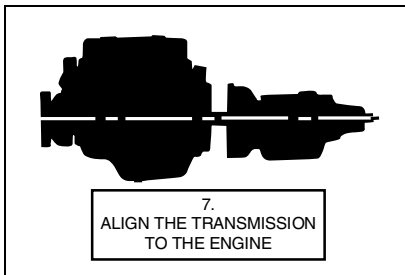
SHTS02Z020200042

6. SHIFT THE TRANSMISSION INTO GEAR.

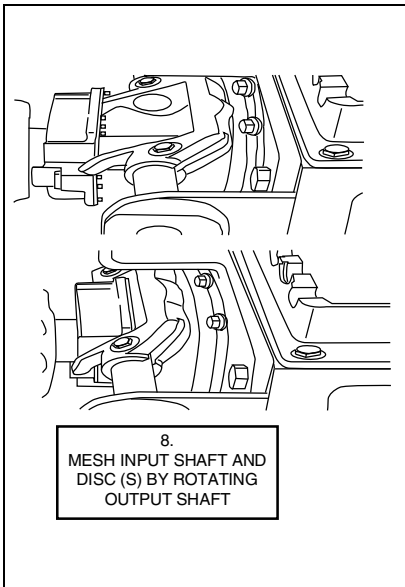


SHTS02Z020200043

7. POSITION THE TRANSMISSION SO THAT IT IS BOTH SQUARE TO AND ALIGNED WITH THE ENGINE.



SHTS02Z020200044



SHTS02Z020200045

8. WHILE MOVING THE TRANSMISSION FORWARD, ROTATE THE OUTPUT SHAFT OF THE TRANSMISSION UNTIL THE SPLINES OF BOTH THE INPUT SHAFT AND THE DISC(S) MESH WITH EACH OTHER. WHILE PERFORMING THIS TASK, YOU MUST ALSO ENSURE THAT THE YOKE FINGERS REMAIN IN THE UP POSITION UNTIL THEY CAN BE ROTATED OVER THE RELEASE BEARING HOUSING INTO THEIR FINAL POSITION.

**CAUTION**

- Do not use the cross-shaft release lever (or a pipe over it) to pull the transmission into its final position. Doing so may release the clutch and "overstroke" the release bearing. The SOLO will incorrectly "set" the release bearing position too close to the transmission and cause the wear indication tab to move to 1/3-1/2 the distance towards the "REPLACE" position.
- Do not excessively force the transmission into the clutch assembly or engine housing. If it does not enter freely, investigate the cause of the problem and make any necessary changes.
- If the input shaft will not slide into the discs, they may need to be repositioned. If the clutch is to be unbolted from the flywheel, re-install the shipping bolts and tighten one turn past contact with the clutch. Now the installation shaft can be installed to reposition the discs and the clutch bolts re-torqued. Remove the shipping bolts to clamp the discs.
- Do not let the transmission drop or hang unsupported in the driven discs.  
This can cause the discs to become distorted and the clutch will not release.

9. INSTALL THE TRANSMISSION MOUNTING BOLTS AND TORQUE TO THE PROPER SPECIFICATION.

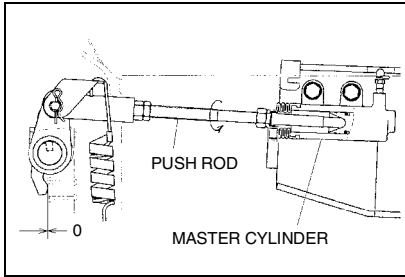
Tightening Torque:

37.5-48.5 N-m{382-494 kgf.cm, 28-35 lbf-ft}

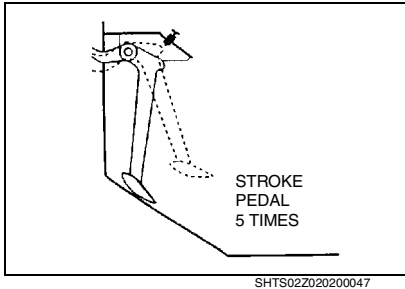
## IMPORTANT POINT-SET-UP

### 1. ADJUST LINKAGE

- (1) Remove the return spring.
- (2) Loosen the lock nut and turn the push rod counterclockwise until the release bearing contacts the release lever plate or release lever.

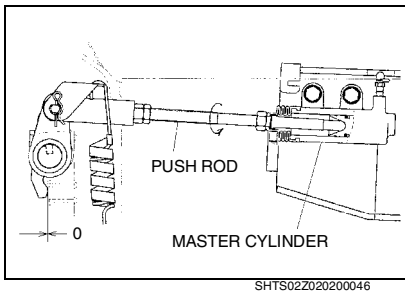


- (3) Fully press the pedal up to 5 times to move the release bearing slightly closer to the transmission and gain free-play in the cab.



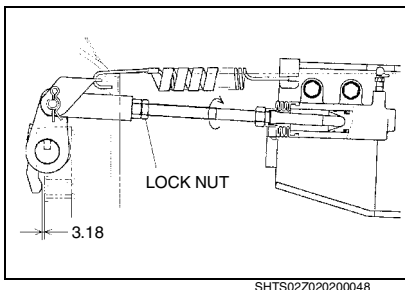
### 2. ADJUST THE FREE TRAVEL

- (1) Turn the push rod counterclockwise until the release bearing contacts the release lever plate or release lever.



- (2) Turn the push rod clockwise about 3 1/3 turns.  
**Standard: Clearance between release bearing and release yoke: 3.18 mm {0.125 in.}**

- (3) Tighten the lock nut.

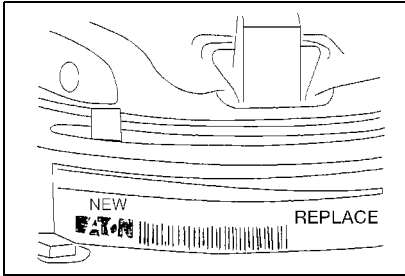


**IMPORTANT POINT-CHECK WEAR INDICATOR**

1. REMOVE THE COVER OF INSPECTION HOLE AT THE BOTTOM OF THE CLUTCH HOUSING.

2. CHECK WEAR INDICATOR

- Reflects clutch wear and indicates when it is time to replace clutch.
- When replacing clutch, should change clutch disc together with clutch cover.



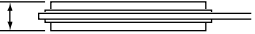
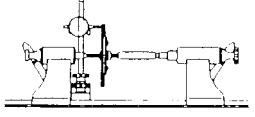
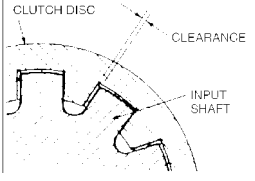
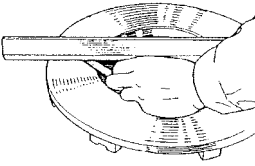

SHTS02Z020200049

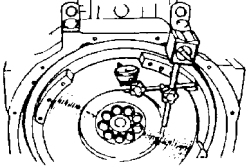

# INSPECTION AND REPAIR

EN02Z0202H300001

EATON SAS1401 and SOLO1401

Unit: mm {in.}

Inspection item	Standard	Limit	Remedy	Inspection procedure
Clutch facing thickness	11.43 {0.45}	8.26 {0.33}	Replace disc assembly.	Measure 
Clutch disc misalignment	0-0.38 {0-0.0149}	0.38 {0.0149}	Replace.	Measure 
Oily facings, Loose rivets, Broken or loose damper springs	—	—	Replace disc assembly, if necessary.	Visual check
Clearance between clutch disc hub and transmission input shaft spline	0.05-0.15 {0.0020-0.0059}	0.5 {0.020}	Replace the clutch disc or the transmission input shaft.	Measure 
Pressure plate misalignment	0-0.102 {0-0.040}	0.76 {0.029}	Replace the clutch cover assembly	Measure 
Pressure plate friction surface scoring or heat cracking	—	—	Replace the clutch cover assembly. <b>NOTICE</b> Regrinding of the pressure plate is not possible.	Visual check
Flywheel misalignment	0.05 {0.0020} or less	1.0 {0.039}	Replace.	Measure 

Inspection item	Standard	Limit	Remedy	Inspection procedure
Flywheel friction surface scoring or heat cracking	—	Grind limit 1.0 {0.039} Deflection limit 0.04 {0.00157}	Regrind the friction surface or replace, if necessary. <b>NOTICE</b> Do not grind the flywheel over the limit.	Visual check
Flywheel misalignment	—	0.15 {0.0059}	Regrind the friction surface or replace.	Measure 
Pilot bearing improper rotation	—	—	Replace, if necessary.	Visual check 

## LUBRICATION (EATON SAS1401 and SOLO1401)

### 1. RELEASE BEARING

- (1) The cast iron bearing housing will be equipped with either a standard grease fitting or a lube tube extension. If a lube tube is not present, it is necessary to remove the inspection cover to gain access to the grease fitting. Apply grease until it purges from the rear of the housing.

### 2. RELEASE BEARING WEAR PADS

- (1) Where the release fork contacts the bearing housing; there are small hardened steel pads. Apply a small amount of grease to the wear pads where the clutch release fork contacts.

### 3. CROSS-SHAFT BUSHINGS

- (1) Lubricate both the left and the right cross-shaft bushings.

### 4. PILOT BEARING

- (1) The pilot bearing inside the flywheel is a sealed for life bearing and requires no lubrication.

## RECOMMENDED LUBRICATION

Use a lithium soap base E.P. (Extreme Pressure) grease with a minimum of +325 degree F operating range. It must meet the N.L.G.I.'s Grade 2 or 3 specs.

### CAUTION

**Incorrect grease and improper lube procedures will cause bearing failures, bushing wearout, yoke tip and bearing wear pad wear.**

Recommended Lubrication			
Supplier	Product	Supplier	Product
American Oil Co.	Amoco Uthium-M.P. Grease	Texaco	Multifak #2
City Service Co.	Citgo Premium Lithium Grease #2	Shell Oil Co.	Retinax A
Fiske Refining Co.	Lubriplate 630-2	Shell Oil Co.	Aivania #2
Keystone Lubricating Co.	#81 Ught	*Chevron Oil Co.	S.R.I. 1~
Mobil	Mobilgrease M.P.	*Texaco	Premium RB
Humble Oil Co.	Udok 2	*Exxon	Unirex N3
Atlantic Richfield Co.	Arco M.P.		
* Approved for vendor prepack, other greases listed are for service only.			



# CLUTCH MAIN UNIT (EATON 1402)

CL02-002

## CLUTCH ASSEMBLY

### (EATON SAS1402)..... CL02-2

DATA AND SPECIFICATIONS .....	CL02-2
DESCRIPTION .....	CL02-2
TROUBLESHOOTING .....	CL02-3
SPECIAL TOOL .....	CL02-5
COMPONENT LOCATOR .....	CL02-6
OVERHAUL .....	CL02-7

## CLUTCH ASSEMBLY

### (EATON SOLO1402)..... CL02-16

DATA AND SPECIFICATIONS .....	CL02-16
COMPONENT LOCATOR .....	CL02-16
OVERHAUL .....	CL02-17
INSPECTION AND REPAIR .....	CL02-27