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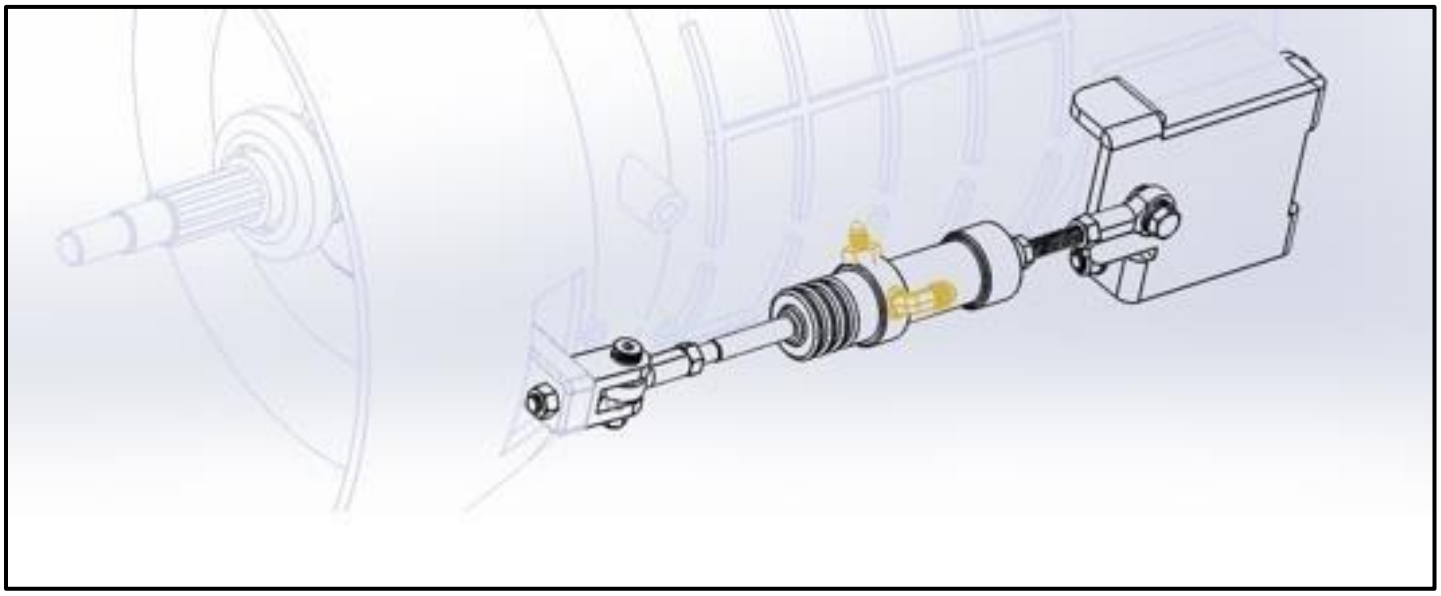
Z1 CLUTCH CONCENTRIC SLAVE CYLINDER (CSC) ELIMINATION KIT INSTALLATION MANUAL



This Installation Manual is intended for the following models:	
2007-2008	Nissan 350Z
2007-2008	Infiniti G35 Sedan
2009-2020	Nissan 370Z
2008-2013	Infiniti G37

PROLOGUE:
Study these instructions completely before proceeding to assembly. The installer must have a thorough knowledge of automotive systems operation. If unfamiliar with any of the concepts outlined in this instruction, we recommend the installation be completed by a qualified professional.

WARNING!
Extreme caution should be taken when performing maintenance or performance upgrades to your vehicle. Please observe and abide by any Warning or Caution labels placed on the various components and tools used when servicing your vehicle. If you have any questions regarding installation or the various components included with the Z1 Motorsports Clutch Concentric Slave Cylinder (CSC) Elimination Kit, consult with a Professional Mechanic or contact Z1 Motorsports for more information.

This Concentric Slave Cylinder Elimination Kit is completely CAD/CAM designed to be a bolt on solution to common VQ35HR and VQ37VHR clutch concentric slave cylinder failures. Although it does not require any permanent modification to the engine or transmissions, installation of this part may void the warranty coverage, if any, on your vehicle.

Parts Included:

Use the following image as reference for component list:

Item	Quantity	Description
A	1	Transmission Front Cover
B	1	Transmission Front Cover Gasket
E	1	Throw Out Bearing Sleeve
F	1	Throw Out Bearing
T	1	SS Clutch Line 31” -4 Straight, -4 90°
C	1	Heavy Duty Clutch Release Fork

Clutch Release Fork Hardware:		
D	1	Clutch Release Fork Pivot Clip
D	1	Clutch Release Fork Sleeve Clip
H	1	Pivot Ball
H	1	Pivot Ball Shim – 4.5mm Washer
H	2	Pivot Ball Shim – 2.0mm Washer
H	2	Pivot Ball Shim – 1.0mm Washer
H	2	Pivot Ball Shim – 0.5mm Washer

Howe Slave Cylinder Assembly:		
I	1	Howe Racing Pull Type Slave Cylinder
I	1	Bleed Fitting
I	1	90° Brass Fitting BSPT
I	1	80mm Cut 5/16” -24 RH Thread Rod
I	3	Nut – Ball 5/16” -24 RH (used for 2 Rod Ends)
I	1	Rod End 5/16” -24 RH Female 5/16” Ball

Z1 Mounting Bracket & Hardware:		
S	1	Z1 Slave Cylinder Mounting Bracket
K	2	M8x1.25 110L Bolt
K	10	M8 Washer
K	3	M8x1.25 Lock Nut
R	1	M8x1.25 35L Bolt

Z1 Clevis Anchor Assembly		
J	1	Clevis Anchor with attachment bolt
J	1	1/4"-20 1" Shoulder Screw
J	2	0.5mm Washer Shim M8 Clearance
J	1	Rod End 5/16"-24 RH Female 5/16" Ball
J	1	M6 Washer
J	1	1/4"-20 Lock Nut
L	2	3/8" Large Diameter Washer with pre-drilled hole
L	1	M8 Large Diameter Washer with pre-drilled hole
J	1	M8x1.25 Lock Nut
M	1	Return Spring

Z1 Heat Shield & Hardware		
Q	1	Z1 Heat Shield
R	1	M10x1.5 35L Bolt
P	1	Nylon Spacer 1"OD 1/2"L 1/2" Screw Clearance
G	1	Transmission Spline Grease Packet
G	1	Small Packet Loctite
U	2	Small Conduit Strap
O	2	M6x1.0 16L
O	2	M6x1.0 Nut
O	4	M6 Washer
Not Pictured	4	8” Zip Ties

Z1 Dust Cover & Hardware		
N	1	Clutch Fork Dust Cover
O	2	M6x1.0 16L
O	2	M6 Washer
P	1	Nylon Spacer 1/2” OD 3/16”L 1/4” Screw Clearance

TOOLS REQUIRED:

- Hydraulic Jack
- (4) 2-Ton (or greater) Jack Stands
- Wheel Chock
- Assorted Metric Wrenches (10-19mm)
- Assorted Metric Sockets (10-19mm)
- Assorted Screwdrivers
- Ratchet
- Funnel or Fill Pump
- T55 Torx Bit
- Concentric Slave Cylinder Torx Bit T30
- Assorted Allen Wrenches
- Pliers and other assorted hand tools
- Calipers (0-150mm)

SAFETY REQUIREMENTS:

- Always wear safety glasses and any necessary protective garments. If using any fluids, chemicals, or solvents, a respirator is recommended.
- Always use properly rated jack stands when working under your vehicle.
- Always keep limbs and parts away from moving drivetrain parts.
- Only operate drivetrain in safe space and well-ventilated areas.

BEFORE YOU BEGIN:

Remove contents from the Z1 Motorsports Clutch Concentric Slave Cylinder (CSC) Elimination Kit and verify that ALL necessary hardware is present.

Installation Note #1:
It is recommended that this kit is installed when the vehicle requires a clutch and/or transmission fluid service. This is due to the necessity of removing the transmission and loss of fluid.

Installation Note #2:
Consult with the Nissan Factory Service Manual (FSM) regarding the removal & installation procedure of OEM components.

PROCEDURE:

1. Assure the car’s ignition is in the OFF position and the NEGATIVE (-) battery terminal is disconnected.

2. Place the transmission in Park position (or in Reverse gear if equipped with a manual transmission). Apply the parking brake.

3. Locate proper jacking points on vehicle’s chassis (refer to vehicle’s Owner Manual). Raise and support vehicle using jack & jack stands. Assure that vehicle is raised a minimum of 16”.

4. Remove and set aside exhaust system from behind catalytic converters/test pipes.

5. Remove and set aside driveshaft as outlined in FSM.

6. Remove transmission drain plug and empty transmission of fluid.

7. Remove crankshaft position sensor as outlined in FSM.

8. Remove starter motor as outlined in FSM.

9. Disconnect OEM CSC Hydraulic Lines and drain fluid.

Installation Note #3:
Clutch fluid is highly detrimental to painted surfaces. Keep painted surfaces on the body of the car free and clear of clutch fluid. Wipe up immediately and wash affected area with water.

Installation Note #4:
Do not depress clutch pedal during removal procedure. Insert a suitable plug to the clutch hose after removing.

10. Remove rear plate cover as outlined in FSM.

11. Disconnect Park/Neutral position switch connector.

12. Disconnect (2) heated oxygen sensors as outlined in FSM.

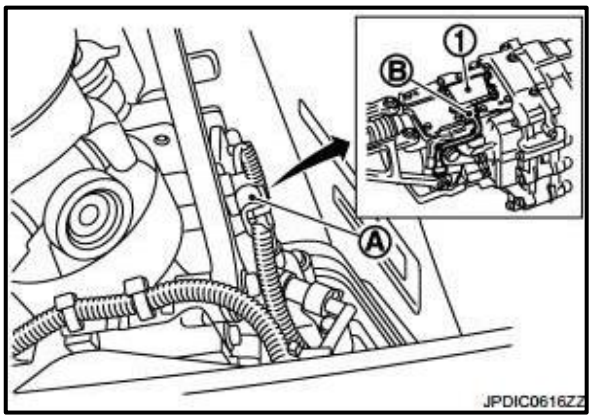
13. For those vehicles equipped with S-MODE, disconnect gear lever position sensor connector (A), as shown.

    Note: DO NOT remove connector (B).

14. Remove rear engine mounting insulator mounting nuts as outlined in FSM.

15. Remove rear engine mounting member as outlined in FSM.

16. Remove (12) engine and transmission mounting bolts.



17. Disconnect Back-up Lamp Switch connector. Remove harness & brackets and temporarily secure them to a position where it will not inhibit work.

18. Remove Transmission as outlined in FSM.

CAUTION:
Secure Transmission Assembly to a suitable jack before removing it. The Transmission Assembly must not interfere with exhaust piping, wire harnesses, or Clutch hose. The input shaft of Transmission must not interfere with Pressure Plate. Never hold control lever housing to prevent the bushing of control lever housing from deformation when moving Transmission Assembly.

19. Remove and set aside Pressure Plate, Clutch Disc, and hardware.

20. Remove and set aside Flywheel and hardware.

21. If re-using Clutch and Flywheel components, perform an inspection of components according to the Factory Service Manual to ensure proper function.

22. Assemble Clutch and Flywheel configuration on a work bench. Center Clutch Disc on Flywheel and mount Pressure Plate to Flywheel with Hardware. Torque Bolts to **29 ft-lbs**, just as it were being installed in vehicle.

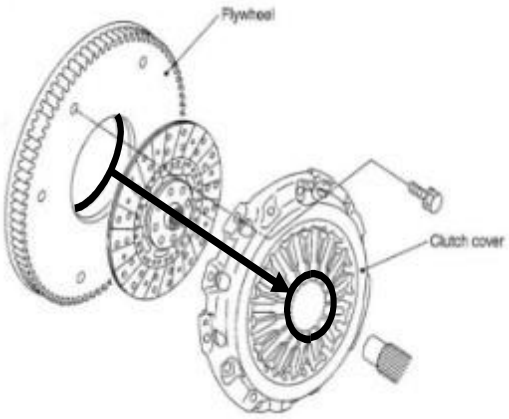
!! IMPORTANT !!

Measure stack heigh of clutch & flywheel assembly. **Recommended precision is within 0.5mm.** This measurement must be from the engine-side of the flywheel to the transmission side of the clutch pressure plate, where the pressure plate fingers contact the throw out bearing.

Be very careful to note the location at which the pressure plate fingers contact the throw out bearing by placing the throw out bearing as axially centered as possible against the pressure plate. Ensure that the throw out bearing seats properly on the pressure plate fingers – different clutches mate to different throw out bearings, as specific by the end user. See the following for a graphical representation figure 4.1. **This measurement will determine the crucial amount necessary to shim the pivot ball. A miscalculation could require repeated instances of removing and installing the transmission.** Use the following equation to calculate the required shim.

Table 0.2 – Standard Clutch/Flywheel Stack Heights & Pivot Ball Shim Calculation:

Clutch	Flywheel	Stack Height	Pivot Shim
Z1 HR Kit	Z1 Flywheel	82.5	7
Z1 HR Kit	OE Nissan	83	6.5
OE Nissan	Z1 Flywheel	87.5	3.5
OE Nissan	OE Nissan	88	3
Z1 Road Race Package		See Table 0.3 (below)	



IF STACK HEIGHT IS LESS THAN 79.5, CONTACT Z1 MOTORSPORTS
Pivot Ball Shim* = (-0.663 x Adjusted Stack Height) + 61.5

*Round up to the nearest 0.5mm shim.
IF PIVOT SHIM CALCULATES TO MORE THAN 10MM CONTACT Z1 MOTORSPORTS!

Table 0.3 – Z1 Road Race Package Pivot Ball Shim Calculation:

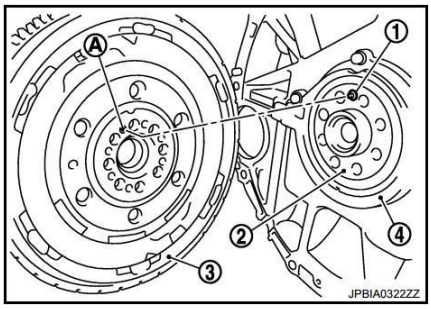
Pivot Ball Shim* = (-0.663 x (Adjusted Stack Height – 3.0)) +61.50

*Round up to the nearest 0.5mm shim.

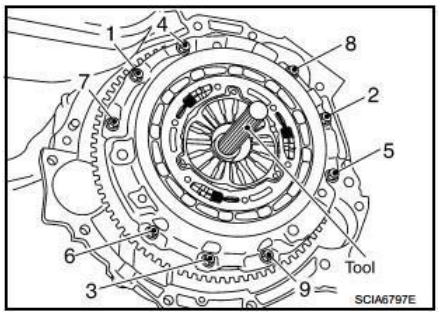
Adjusted Stack Height: Verify the specific throw out bearing – depending on the clutch kit specified when ordered, varying throw out bearing will be included. **Any bearing that is NOT KOYO RCT40SA3 (indicated on the bearing) will require SUBTRACTING a 0.6mm factory to the measured stack height to function in this model. See trouble shooting section for stack heights greater than 90mm.**

23. Reinstall flywheel to backside of engine as outlined in the Nissan Factory Service Manual. Ensure flywheel is properly aligned as in figure 5.1. Torque flywheel in typical start pattern as outlined in the Nissan FSM to **65ft-lbs**.

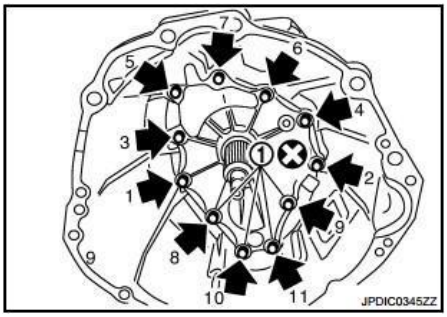
24. Install clutch disc and pressure plate using alignment tool. Tighten to specified torque evenly in two steps as shown in figure 5.2. Torque to **11ft-lbs** and then **29ft-lbs**.



F5.1



F5.2



F6.1

25. Locate transmission. Remove concentric slave cylinder assembly as outlined in FSM.

26. Remove transmissions front cover & gasket. Remove and set aside mounting bolts (#1-7) and sealing bolts (#8-11). Refer to figure 6. 1

    Note: Be sure to label which bolts are sealing bolts.

27. Locate & install new transmission front cover and gasket. Tighten front cover bolts as shown in figure 3.1. Torque to **13ft-lbs**.

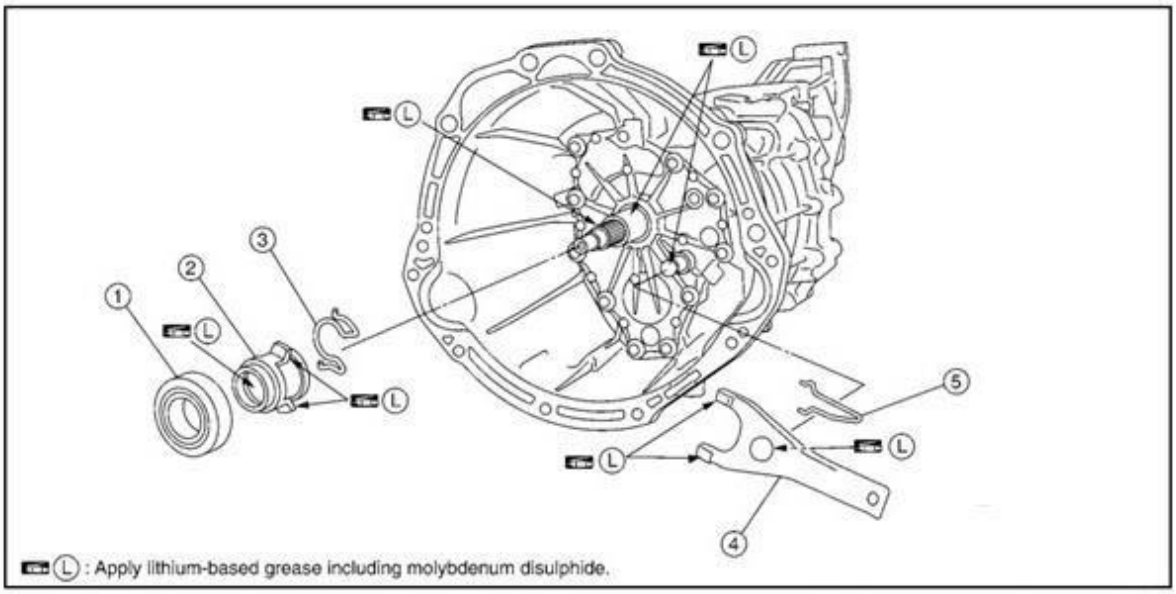
    Note: Use thread sealant on bolts #8-11.

28. Install pivot ball with previously calculated shim height. Apply a small amount of thread locker prior to installing. Toque to **30ft-lbs** for shims less than or equal to 4.5mm. Torque to **24ft-lbs** for shims greater than 4.5mm.

29. Install throw out bearing onto bearing sleeve. Assure that stamped part number of bearing is facing transmission. Assure that bearing is evenly pressed onto sleeve.

30. Install pivot ball retaining clip onto clutch fork.

31. Install bearing sleeve & retaining clip onto clutch fork.



1. Throw Out Bearing
2. Bearing Sleeve
3. Bearing Sleeve Retaining
4. Clutch Fork
5. Pivot Ball Retaining

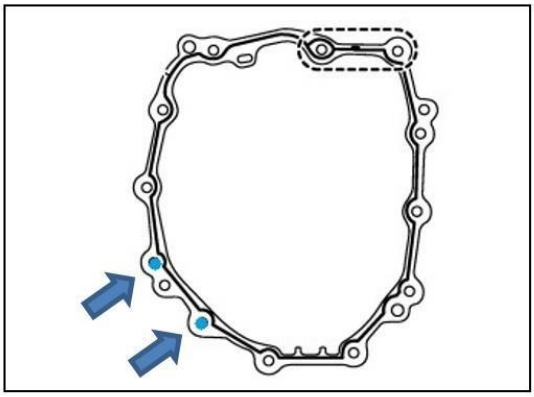
F6.4

Installation Note #5:
Wipe off old grease, debris, and/or powdery residue left on all clutch components. Apply an even 1mm coating of grease included in packet to splines of the transmission input shaft ONLY. Over-greasing the splines will lead to premature clutch failure.

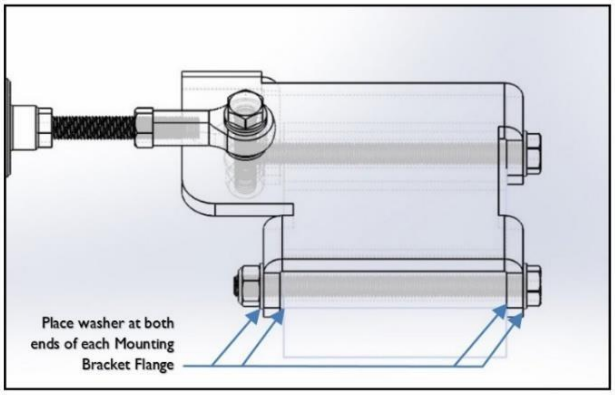
Installation Note #6:
Be sure to apply grease to the points specified in figure F6.4. Otherwise, noise, poor disengagement, or damage to the clutch may result. Excessive grease may cause slip. Wipe off excessive grease from components. Be careful not to spread grease into contact with clutch disc, pressure plate surface, or flywheel.

Installation Note #7:
Inspect for smooth operation of components before reinstalling transmission by sliding clutch fork. The clutch fork should move freely within the "window" in the transmission housing where the concentric slave hydraulic piping was previously located.

Use the following figures as reference for the following steps:



F7.1



F7.2

32. Locate and remove (2) bolts at rear of transmission housing, as shown in figure 7.1.

    Note: Those with a solid transmissions mount may require removing the transmission support brace.

33. Locate & orient slave cylinder mounting bracket onto transmission housing, as shown in figure 7.2.

    Note: Assure that the bracket clears the dowel and casting ribs of transmission.

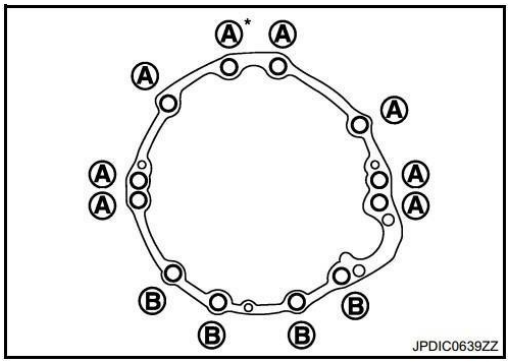
34. Locate (2) M8-1.25 x 110mm bolts and (8) M8 flat washers. Place a flat washer at each side of the (4) mounting bracket flanges. Insert bolt through mounting bracket and transmission housing, facing the front of the vehicle as shown in figure 7.2.

35. Apply a small amount of thread locker near the end of each bolt.

36. Locate (2) M8-1.25 hex nuts. Thread nut onto each bolt. Torque to **20ft-lbs**.

37. Reinstall transmission to engine. Assure that transmission-to-engine bolts are torqued to specification, as shown below.

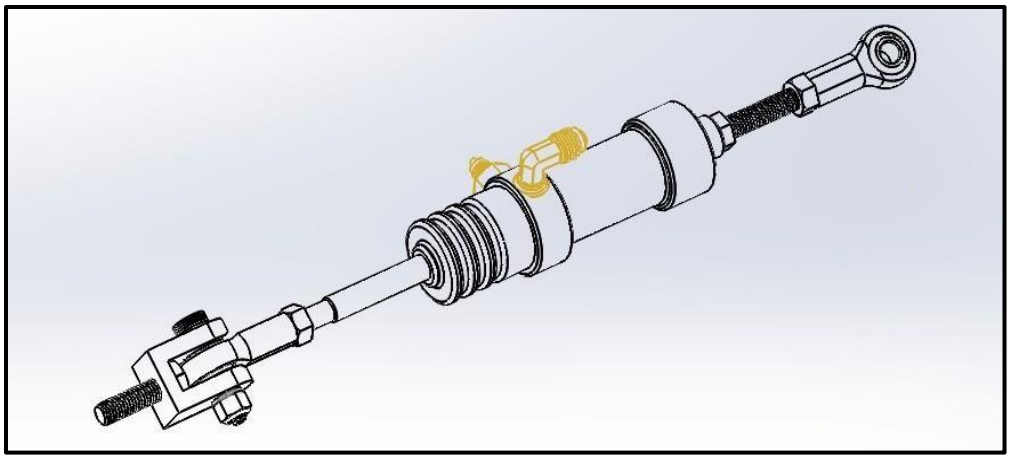
Bolt symbol	A	B
Insertion direction	Transmission to engine	Engine to transmission
Number of bolts	8	4
Bolt length mm (in)	65 (2.56)	35 (1.38)
Tightening torque N·m (kg-m, ft-lb)	75 (7.7, 55)	46.6 (4.8, 34)



38. Locate and assemble Clevis Anchor onto threaded end of Howe Slave Cylinder. Use a M8 x 0.5mm shim on each side of rod end. Assemble using 1/4" -20 shoulder bolt, flat washer, and nyloc nut. Torque to **10ft-lbs**.

    Note: Apply thread locker to Clevis Anchor hardware and rod end jam nut.

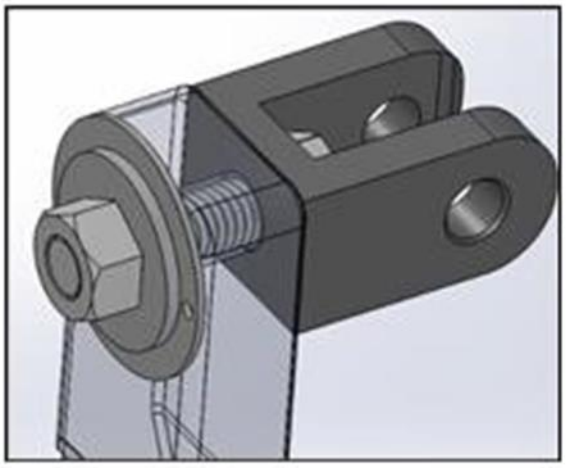
    Howe Slave Cylinder Assembly should appear as shown:

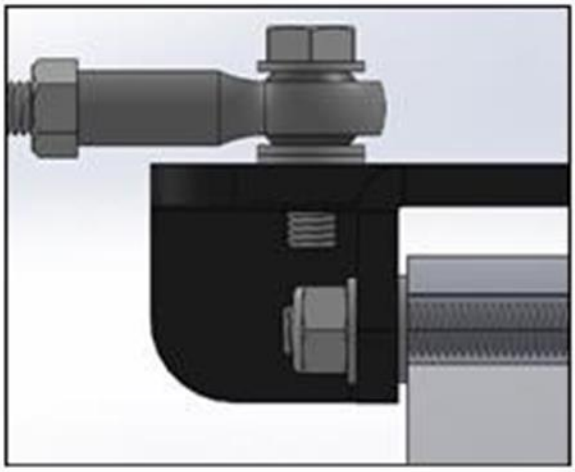


39. Attach Clevis Anchor assembly to clutch fork. Assure that width of anchor is aligned with width of clutch fork, as shown. Assure that pre-drilled hole of washer is clear of clutch fork. Apply thread locker to Clevis threads and torque to **22ft-lbs**.

40. Attach rod end at rear of slave cylinder to mounting bracket using (2) M8 flat washers and M8-1.25 x 40mm bolt. Apply thread locker and torque to **22ft-lbs**.

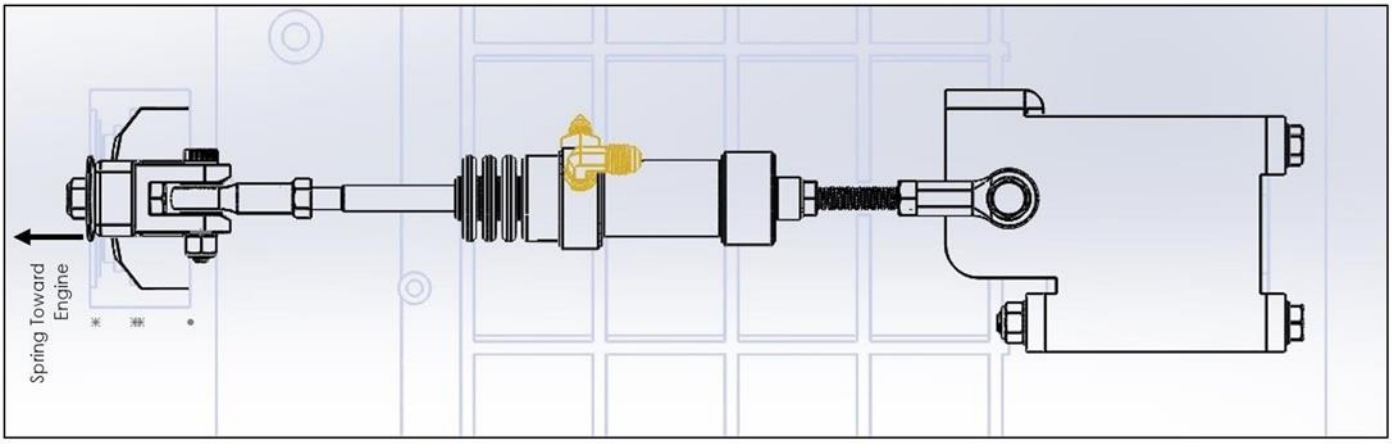
    Note: Assure that slave cylinder bleeder is pointing upward, otherwise all air cannot be bled out of the hydraulic system.





Installation Note #8:
The threaded section at the rear of the slave cylinder will be used for clutch adjustment. The components ma be tightened, but thread lock is not recommended until the slave cylinder is adjusted correctly.

Installation Note #9:
Ensure that rod ends are fastened in proper alignment to their respective mounting planes. Failure to do so can introduce unwanted slop into the system, or a high misalignment angle that can cause failure. See figure below as the system should sit evenly in installation.



41. Locate and remove transmission/engine bolt directly in line with clutch fork.

42. Locate and install (2) 3/8" washers with pre-drilled hole over transmission bolt. Align holes of drilled washers are aligned. Torque bolt to **34 ft-lbs**.

43. Locate and install return spring onto holes in transmission and clutch fork washers.

    Note: spring should have at least 10mm of preload. Otherwise using a pair of pliers, introduce preload.

44. Locate and install stainless steel clutch line.

45. Bleed clutch hydraulic system and ensure proper function. Refer to FSM for further details.

    Note: Use DOT4 hydraulic fluid. Ensure that clutch fluid reservoir does not become empty, as it will draw air into hydraulic system. Ensure that debris does not enter the hydraulic system. Do not reuse clutch fluid.

46. Locate and remove clutch pedal assembly helper spring (09+ vehicles only). Removal of the helper spring will introduce a stiffer pedal, but will help increase pedal resolution and reduce play. Simply remove helper spring from clutch pedal assembly.

47. **Adjustment**
    This kit will require adjustment in the clutch pedal and/or clutch slave cylinder. Depending on initial adjustment and specific clutch kit height, the following steps may need to be taken (in order):

    A. Adjust threaded rod at rear of slave cylinder, ensring proper gap between throw out bearing to pressure plate. ***(90% of adjustment)***

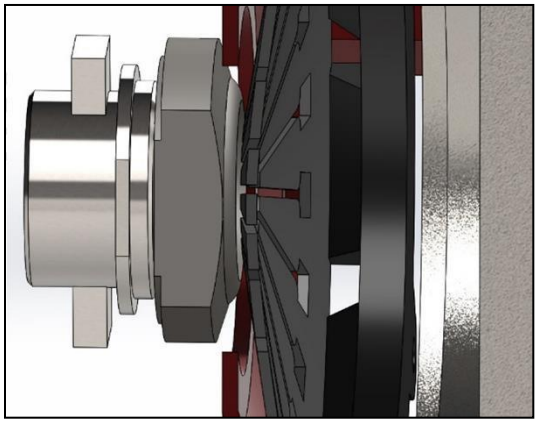
    B. Adjust clutch pedal position, ensuring proper dead pedal and clutch engagement point.

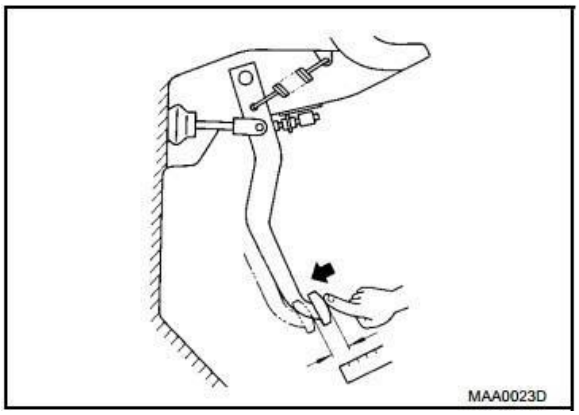
    C. Re-adjust threaded rod at rear of slave cylinder, if necessary.

    Detailed Steps

    A. Adjust the overall length of slave cylinder. This can be accomplished by adjusting threads engaged in the rear/static body of slave cylinder. Ensure that when adjusted, the throw out bearing does NOT touch pressure plate fingers.

Note: Contact between the bearing and the pressure plate while disengaged will result in premature failure of the bearing. Approximately 0.5-1.0mm of clearance of air gap should be present between the contact point of the throw out bearing and the fingers of the clutch pressure plate, as show. This can be confirmed by either manually testing play of the return spring with the slave cylinder detached, or by pressing the clutch pedal with the return spring and slave cylinder attached.



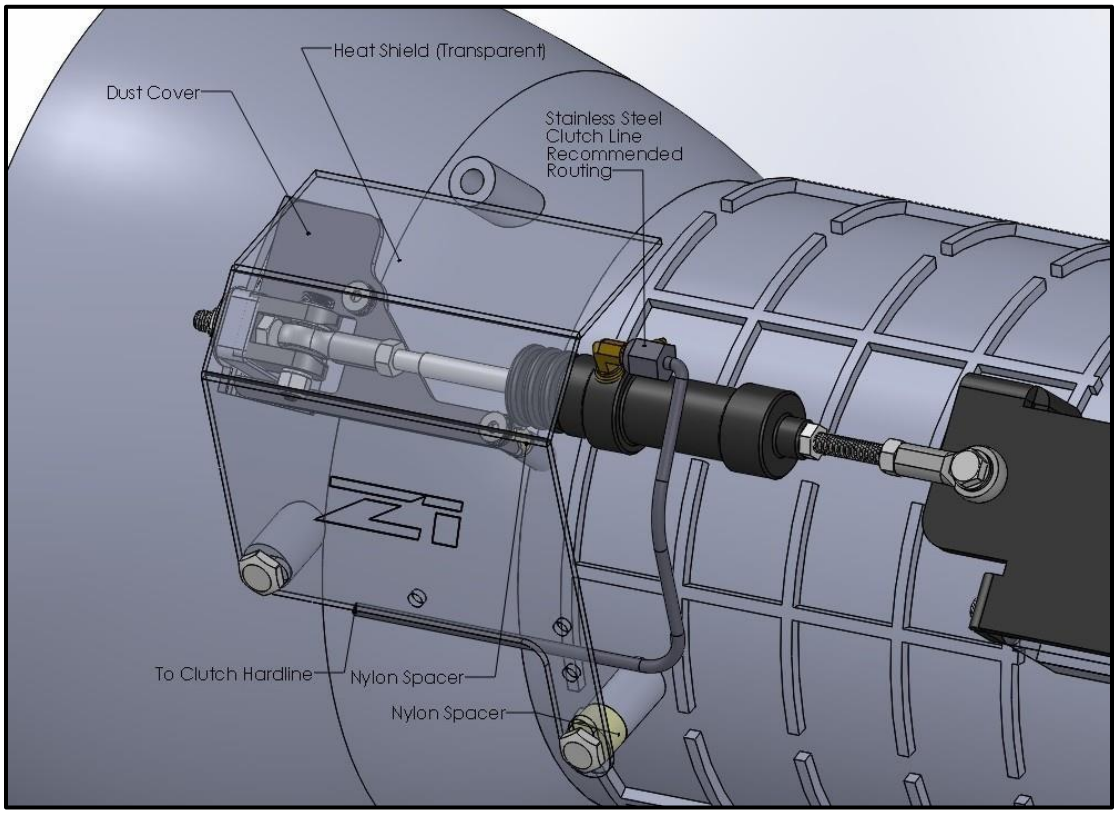


B. Adjust clutch pedal position. There should be approximately 2.0-4.0mm of pedal free play when actuated by hand, pressing until throw out bearing contact with pressure plate can be felt. If needed, adjust the clutch pedal position as outlined in Nissan FSM (CL-5).

48. Once proper pedal adjustment is confirmed, verify clutch fork movement inside transmission housing window. Have an assistant engage the clutch pedal several times while verifying adjustment. Assure that clutch fork does not touch either the front or rear of transmission housing window.

Note: If clutch fork touches **rear** of the window, remove transmission and **increase** pivot ball shim height. If clutch fork touches **front** of the window, remove transmission and **decrease** pivot ball shim height.

Use Figure below as reference for the following steps:



49. Install clutch fork dust cover using (2) M6 bolts, washers, and nylon spacer.

50. Install heat shield using (2) M10 bolts and nylon spacer. Reuse bolt previously fastening OEM electrical connector bracket. Secure stainless steel clutch line by routing zip ties through holes in heat shield.

    Note: Ensure that there is little play in the clutch line to ensure it does not get worn against the transmission or the heat shield. Failure to do so could cause premature wear of the clutch line.

51. Inspect and fill transmission & clutch fluid levels.

52. Follow steps #4-17 in reverse order to re-install components into vehicle.

53. Start engine and inspect for leaks. Shift through ALL gears to ensure proper engagement. Ensure that there is no difficulty shifting into any gears, or engaging the clutch in any gears. Re-adjust if necessary.

54. Properly lower vehicle from jack stands. Perform a final test drive of the vehicle.

Additional End-User Product Care Information:
Because of the very narrow window in which this product was designed to function as a bolt on solution, this product may require fine-tuning and adjustment. Not unlike a clutch adjustment, it is strongly recommended to ensure proper clutch engagement and throw out bearing disengagement, typically at oil change intervals. As the clutch wears, the stack height will increase as the pressure plate fingers lift rearwards away from the engine through normal clutch function and operation. To accommodate this, it may be necessary to simply increase the overall length of the cylinder using the rear-side (static side) threaded rod – a half turn is usually sufficient.

END

Additional Technical Support:
Contact Z1 Motorsports at info@z1motorsports.com
Or call 770-838-7777 between 9am and 6pm ET