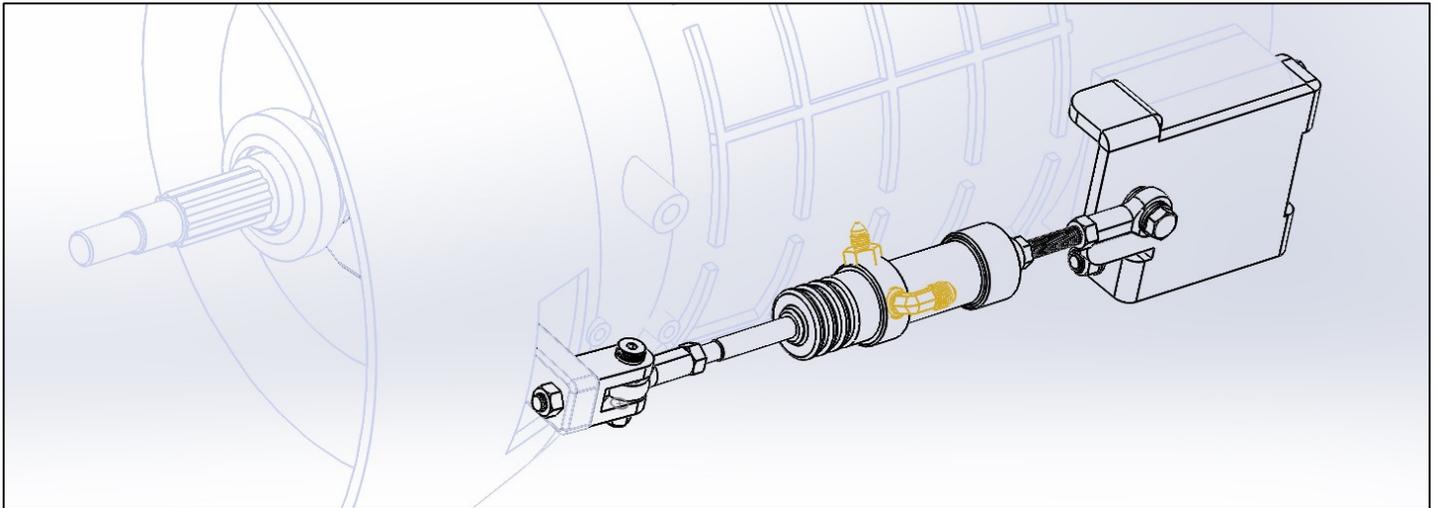




## VQHR+ Concentric Slave Cylinder Elimination Kit Installation Instructions



### **IMPORTANT:**

Extreme caution should be taken when performing ANY 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 to service your vehicle.

### **PROLOGUE:**

Study these instructions completely and thoroughly before proceeding to assembly. Engine and/or transmission damage may occur if any component outlined within these instructions is improperly installed. ZIMotorsports™ or any of its affiliates cannot be held responsible for damages as a result of negligent or improper usage or installation.

The ZIMotorsports™ 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 transmission, installation of this part may void the warranty coverage, if any, on your vehicle.

**Installation can be completed using common tools and automotive procedures. The installer must have a thorough knowledge of automotive drivetrain operation. If unfamiliar with any of the concepts outlined in these instructions, we recommend the installation be completed by a qualified professional.**

The information contained in this publication is accurate and in effect at the time the publication was approved for printing and is subject to change without notice or liability. If you have any questions regarding the installation or the various components included with the ZIMotorsports™ Concentric Slave Cylinder Elimination Kit, consult with a qualified professional or contact ZI Motorsports directly for more information at 770 838 7777 or [zlmotorsports.com](http://zlmotorsports.com).

## **Before You Begin:**

Study these instructions completely and thoroughly before proceeding to assembly. Remove components from carton and inspect for obvious physical damage. All kits are thoroughly inspected and packaged prior to shipping. If any damage is evident, please call ZIMotorsports at 770 838 7777.

**Review and ensure proper quantities of components as listed below in *Table 0.1* and reference photograph. Turn to page 3 to verify that all necessary system components are present prior to installation.**

### **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 the vehicle. While vehicle is on the ground use wheel chocks and parking brake to reduce possibility of unintended vehicle movement.
- Always turn the ignition to the OFF position and disconnect the NEGATIVE battery terminal.
- Always keep loose limbs and parts away from moving drivetrain parts.
- Only operate drivetrain in clear space and well ventilated areas.

### **Tool Requirements:**

Installation can be completed using common tools and automotive procedure, the installer must have a thorough knowledge of automotive drivetrain operation. If unfamiliar with any of the concepts outlined in these instructions, we recommend the installation be completed by a qualified professional.

- |   |  |
|---|--|
| -Floor jack(s) and/or lift. Rated jack stands.                        | -Assorted Metric Sockets (10-19mm)                     |
| -Assorted Metric Wrenches (10-19mm)                                   | -Ratchet   |
| -Assorted Screw Drivers   | -Assorted Allen Wrenches                               |
| -Funnel or Fill Pump  | -Pliers and other assorted hand tools                  |
| -Flywheel Torx Bit T55  | -Calipers (0-150mm or similar or similar straightedge) |
| -Concentric Slave Cylinder Torx Bit T30                               |  |
| -A friend to help bleed clutch (not required but much more effective) |  |

### **Quick Reference:**

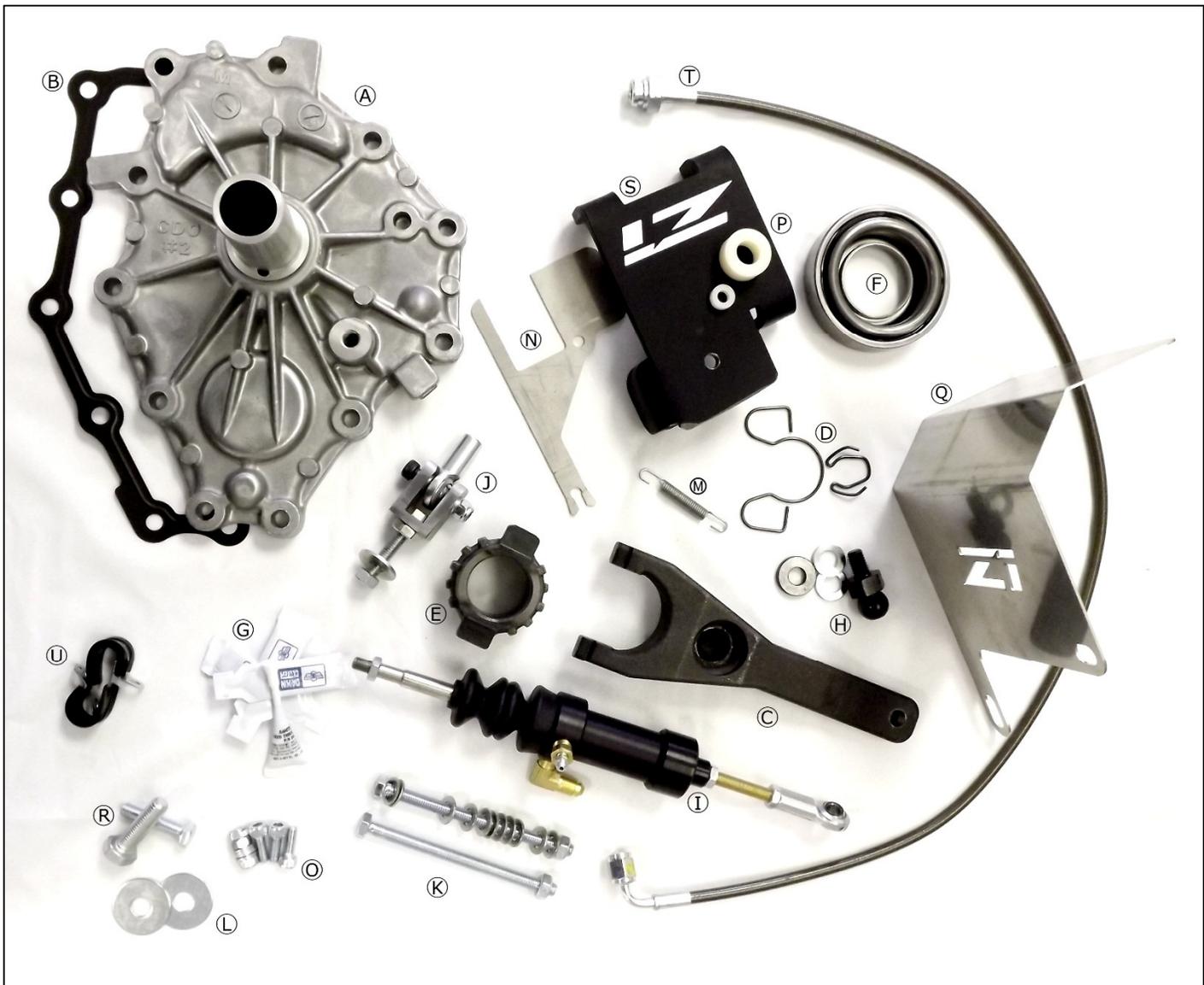
<b>Page 03</b>	Component List Section Starts
<b>Page 05</b>	Installation Guide Section Starts
<b>Page 06-07</b>	Stack Height and Shim Height Calculation
<b>Page 14</b>	Adjustment Section Starts
<b>Page 15</b>	End-User Product Care
<b>Page 16</b>	Troubleshooting

**!!      Space Intentionally Left Blank      !!**

## Components Included Table 0.1

Component/Description	Quantity	Reference#
Transmission Front Cover	1	A
Transmission Front Cover Gasket	1	B
Heavy Duty Fork	1	C
Fork – Pivot Clip	1	D
Fork – Sleeve Clip	1	D
Throw Out Bearing Sleeve	1	E
Throw Out Bearing	1	F
Grease Packets	3	G
Pivot Ball	1	H
Pivot Ball Shim – 4.5mm Washer	1	H
Pivot Ball Shim – 2.0mm Washer	2	H
Pivot Ball Shim – 1.0mm Washer	2	H
Pivot Ball Shim – 0.5mm Washer	2	H
Howe Racing Pull Type Slave Cylinder	1	I
Includes:		
Nut - Ball 5/16"-24 RH (used for 2 Rod Ends)	3	I
Rod End 5/16"-24 RH Female 5/16" Ball	1	I
Nut - Rod End 5/16"-24 (used for shaft locknut)	1	I
Bleed Fitting	1	I
Rod End 5/16"-24 RH Female 5/16" Ball	1	J
80mm Cut 5/16"-24 RH Threaded Rod	1	I
ZI Clevis Anchor	1	J
1/4"-20 Lock Nut	1	J
1/4"-20 1" Shoulder Screw	1	J
M6 Washer	1	J
M8x1.25 Lock Nut	1	J
M8 Large Diameter Washer DIN 9021 (fork side)	1	L
3/8" Large Diameter Washer DIN 9021 (trans side)	1	L
Return Spring	1	M
0.5mm Washer Shim M8 Clearance	2	J
ZI Dust Cover (or The Whale)	1	N
M6x1.0 15L	2	O
M6 Washer	2	O
Nylon Spacer 1/2"OD 3/16"L 1/4" Screw Clearance	1	P
ZI Heat Shield	1	Q
M10x1.5 35L Screw C8.8	1	R
M10x1.5 20L (reuse on car)	1	Not Included
Nylon Spacer 1"OD 1/2"L 1/2" Screw Clearance	1	P
	<b>continued</b>	

ZI VQCSCD Mounting Bracket	1	Ⓢ
M8x1.25 110L DIN933 C8.8	2	Ⓚ
M8 Washer	6	Ⓚ
M8x1.25 Lock Nut	3	Ⓚ
M8x1.25 35L	1	Ⓡ
Small Packet Loctite	1	ⓐ
90 Degree Brass Fitting BSPT	1	ⓓ
Braided Steel Line 31" -4 straight, -4 90	1	Ⓣ
#L Clutch Fluid (end user specified option)	1	Not Pictured
#L Transmission Fluid (end user specified option)	1	Not Pictured
Small Conduit Strap	2	Ⓤ
M6x1.0 16L Socket Cap Bolt	2	ⓐ
M6x1.0 Nut	2	ⓐ
M6 Washer	2	ⓐ



## Installation:

### Installation Note #1:

It is recommended that the ZIMotorsports VQCSEK be installed at a scheduled interval when the vehicle requires a clutch or clutch hydraulic service and/or transmission fluid service. This is due to the necessity of removing the transmission and the possible loss of fluid in replacing the transmission front cover. Alternatively, it is possible to tilt transmission backwards and plug the rear exit to maintain existing transmission fluid.

1. Start with a safe and level place to work. Park the car and apply the parking brake. Properly raise and support the vehicle using a 2 or 4 post lift, or jack stands at the proper jacking points on your vehicle's chassis. Refer to the Vehicle Owner's Manual for assistance in this step.

2. Drain transmission fluid prior to removal, or ensure that when the front cover is removed, the transmission is tilted backwards and the rear exit plugged to prevent loss of fluid.

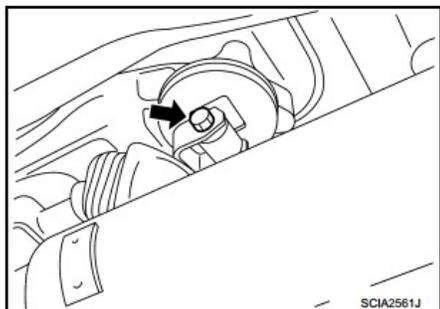
Proceed to remove the transmission as outlined in the Nissan Factory Service Manual (starting page 2009 370z TM-31 – the following will outline the steps described in TM31). Start by removing control lever/shifter bolt, interior console finisher assembly, shifter boot, shifter bracket, and shifter holding guide plate as shown in the below images (F2.1-F2.5). Separate the shifter assembly from the transmission shifter linkage. Remove clutch tube (1), clutch hose (2), and lock plate (3) as seen in F2.6.

### Installation Note #2:

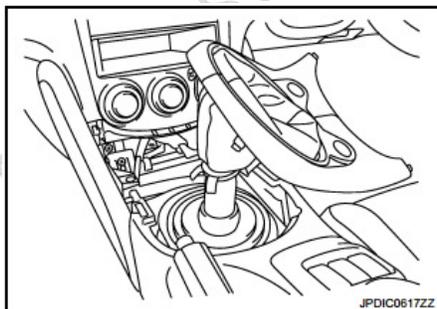
Clutch fluid is highly detrimental to painted and other finished surfaces. Keep painted surfaces on the body of the car free and clear of clutch fluid. Wipe up immediately and wash affected area with water.

### Installation Note #3:

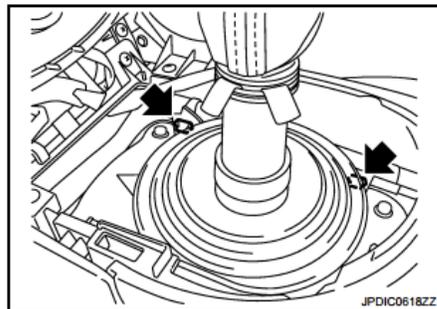
Never depress clutch pedal during removal procedure. Insert a suitable plug to the clutch hose after removing.



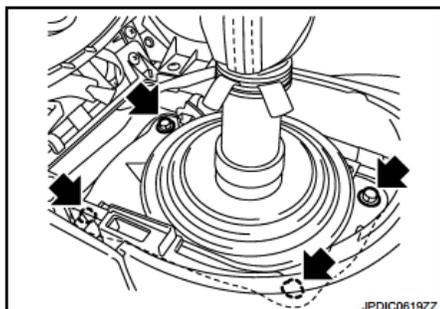
F2.1



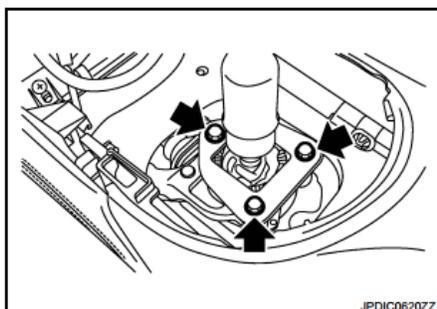
F2.2



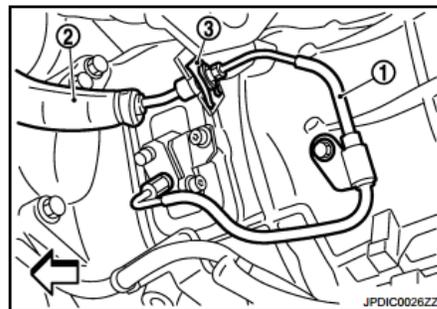
F2.3



F2.4



F2.5



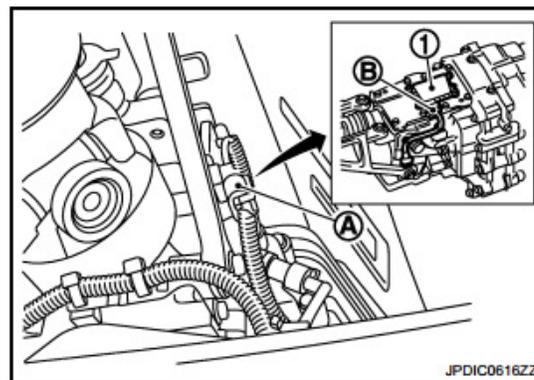
F2.6

2. (continued) Remove crankshaft position sensor. Refer to EM-68, "Removal and Installation". Remove starter motor. Refer to STR-18, "M/T: Removal and Installation". Remove rear plate cover. Refer to EM-44, "Removal and Installation". Disconnect park/neutral position (PNP) switch connector. Disconnect heated oxygen sensor 2 (bank 1) and heated oxygen sensor 2 (bank 2) connectors. Refer to EX-6, "Removal and Installation".

**WARNING:** For those cars equipped with S-MODE:

Gear lever position sensor connector (A).  
**NEVER** remove connector (B).

See figure 2.7 on right for further details.



F2.7

**Installation Note #4:**

Set a suitable jack to the transmission assembly. By placing wooden block between oil pan (upper) and front suspension member, the removal of transmission assembly from engine becomes easier.

**CAUTION:**

When setting a suitable jack, be careful so that it does not contact with the wire harness. Secure transmission assembly to a suitable jack while removing it. The transmission assembly must not interfere with exhaust piping. The transmission assembly must not interfere with the wire harnesses and clutch hose. The main drive gear must not interfere with the clutch cover. Never hold control lever housing to prevent the bushing of control lever housing from deformation when moving transmission assembly.

**2. (continued)** Remove engine mounting insulator (rear) mounting nuts. Refer to EM-68, "Removal and Installation". Remove rear engine mounting member. Refer to EM-68, "Removal and Installation". Remove engine and transmission mounting bolts. Lower a suitable jack to the position where the back-up lamp switch connector can be disconnect. Then disconnect back-up lamp switch connector. Remove harness and harness brackets and then temporarily secure it to a position where it will not inhibit work.

Remove transmission assembly from the engine.

**3. If installing a NEW CLUTCH AND FLYWHEEL proceed to step 4. If reusing either the clutch and/or flywheel in the current configuration, please continue with step 3.**

Remove clutch cover mounting bolts and washers. Remove clutch cover and clutch disc. Remove flywheel. Be careful to not drop any components. While the components are removed, it is recommended to inspect the clutch and flywheel components according to the Factory Service Manual to ensure proper function.

**4.** Assemble the clutch and flywheel configuration to be installed on a benchtop or tabletop. Center the clutch disk between the clutch and flywheel, and bolt the pressure plate to the flywheel as if it were being installed in the vehicle. Ensure proper tightness of fasteners.

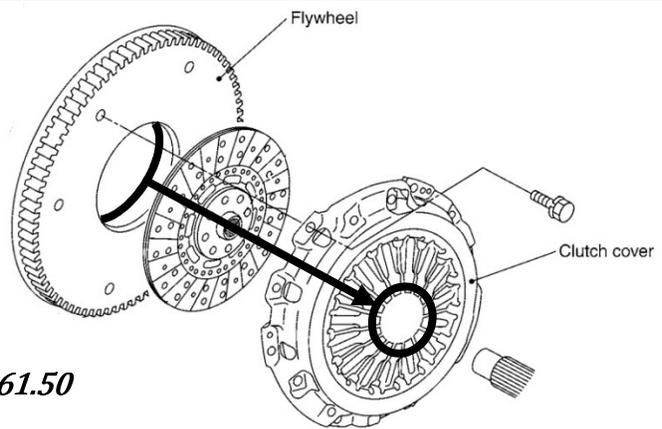
**!! Important !!**

Very carefully measure the stack height of the height of the clutch and flywheel assembly. **Recommended precision is +/- less than 0.5 millimeters.** This measurement must be measured from the engine-side of the flywheel to the transmission side of the clutch pressure plate where the pressure plate fingers would 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 clutch cover. Ensure that the throw out bearing seats properly on the pressure plate fingers – different clutches mate to different throw out bearings, as specified 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.** The table below (table 0.2, page 7) shows an example clutch and flywheel combinations, and their respective stack heights, however, heights may vary and should **always** be verified. Use the following equation to calculate the required pivot shim.

**Table 0.2 – Example Clutch/Flywheel Stack Heights and Corresponding Pivot Shims**

Clutch	Flywheel	Stack Height	Pivot Shim
Z1 HR Kit	Z1 Flywheel	82.5	7.0
Z1 HR Kit	OE Nissan	83.0	6.5
OE Nissan	Z1 Flywheel	87.5	3.5
OE Nissan	OE Nissan	88.0	3.0



F4.1

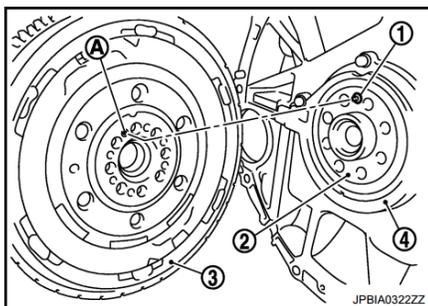
$$\text{Pivot Shim}^* = (-0.663 \times \text{Adjusted Stack Height}) + 61.50$$

\*Round up to the nearest 0.5mm shim.

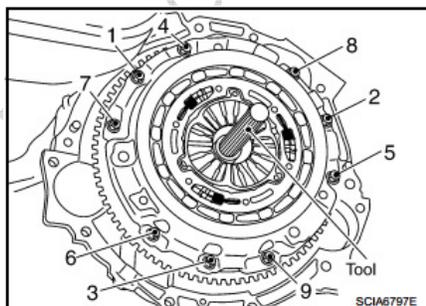
Take note of the pivot shims prescribed. Use the provided equation to determine the necessary pivot shim.

**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 factor to the measured stack height to function in this model. See trouble shooting section for stack heights >90mm.**

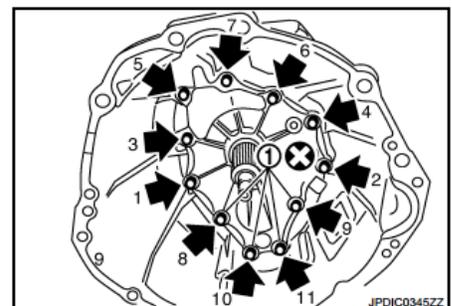
**5.** Reinstall the clutch and flywheel according to proper procedure outlined in the Nissan Factory Service Manual. Ensure the flywheel is properly aligned as in figure 5.1. Torque flywheel in typical star pattern as outlined in Nissan Factory Service Manual to **Torque 88 Nm (9.0 kg-m, 65 ft-lb)**. Install clutch using alignment tool and tighten to specified torque evenly in two steps in numerical order shown in figure 5.2 to **Torque 15 Nm (1.5 kg-m, 11 ft-lb)**, then **39 Nm (4.0 kg-m, 29 ft-lb)**.



F5.1



F5.2

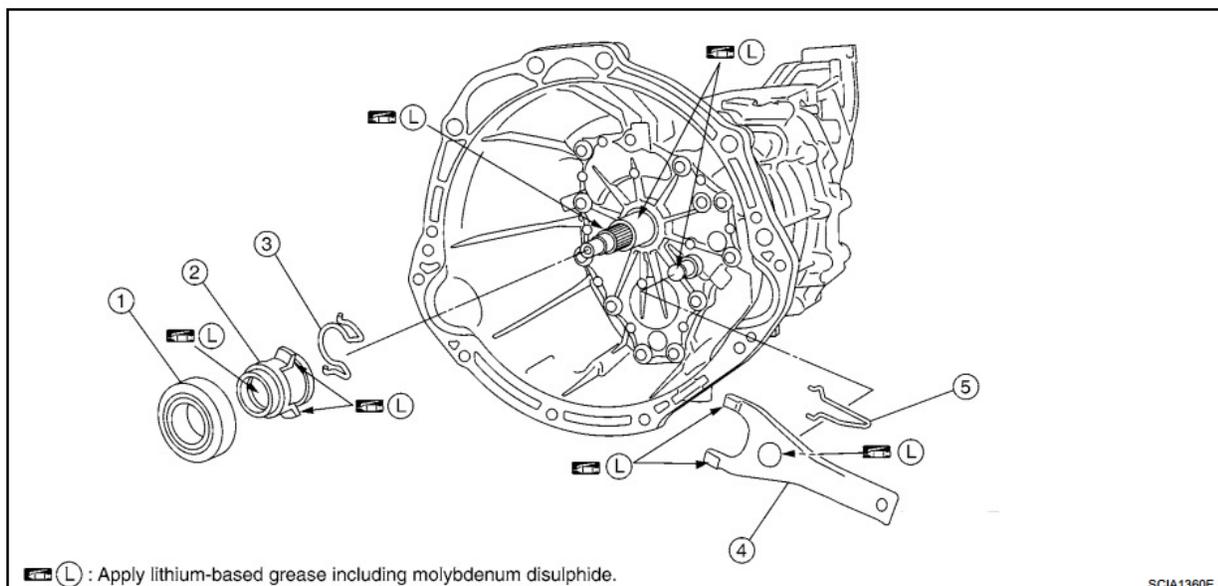


F6.1

**6.** Remove concentric slave cylinder as outlined in FSM starting at CL-16. Unbolt outer flange of CSC, remove the inner lock pin, pull out the CSC tubes, bleeder, and dust cover and remove CSC body. Remove transmission front cover. Start by draining gear oil (optional), then removing the mounting bolts (#1-7) and sealing bolts (#8-11). Remove front cover and front cover gasket. Refer to above figure 6.1. Set these aside, noting which bolts are sealing bolts.

Install transmission front cover and gasket. Tighten front cover bolts indicated as shown in figure 6.1 to **Torque 18 Nm (1.8 kg-m, 13 ft-lb)**, using thread sealant on bolts #8-11. Refill gear oil to proper level using proper fluid and no leaks. Install pivot ball and previously calculated shim. Be sure to apply a small amount of supplied thread locker prior to installing. **Torque to 40 Nm (4.0 kg-m, 30 ft-lb)** for shims less than or equal 4.5mm. For shims greater than 4.5mm torque to **32 Nm (3.2 kg-m, 24 ft-lb)**.

Install throw out bearing onto bearing sleeve. The bearing should be evenly pressed onto the bearing sleeve to allow full and proper function. Install pivot retaining clip into fork, and bearing sleeve retaining clip onto fork, making sure that the entire clip is seated in the deep groove. All components should be greased according to the FSM, as indicated in figure 6.4



(L) : Apply lithium-based grease including molybdenum disulphide.

- |                     |                           |                  |
|---------------------|---------------------------|------------------|
| 1. Release bearing  | 2. Release bearing sleeve | 3. Holder spring |
| 4. Withdrawal lever | 5. Retainer spring        |                  |

F6.4

#### **Installation Note #5:**

Be sure to apply grease to the points specified. Otherwise, noise, poor disengagement, or damage to the clutch may result. Excessive grease may cause slip or quiver. Wipe off any grease oozing from the parts. Be careful not to bring any grease into contact with the clutch disc facing, pressure plate surface, or flywheel surface.

#### **Installation Note #6:**

Wipe off any old grease, debris, or powdery residue left on the surfaces. Evenly apply a 1 mm thick coating of recommended grease to withdrawal lever and release bearing sleeve or holder spring sliding surface. Apply recommended grease to ball pin contact surface of the withdrawal lever and inner slots of the release bearing. Overgreasing splines **will** lead to premature clutch failure.

The grease surface should be level with the surrounding area. Evenly apply a thin coat of recommended grease to the release bearing sliding surface. Install release bearing. Wipe off any excess grease that oozes from the parts and then remove release bearing.

#### **Installation Note #7:**

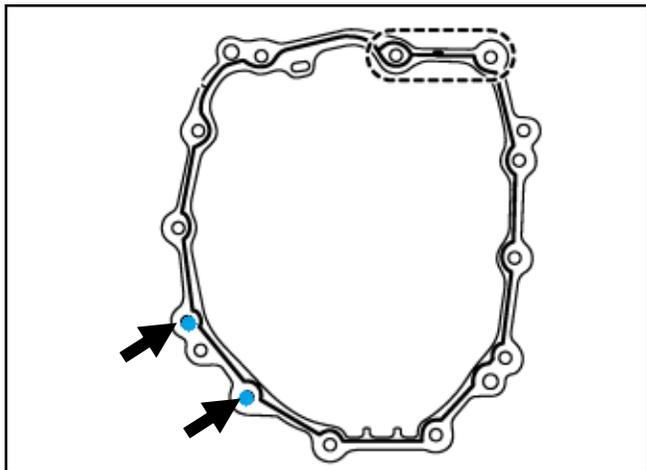
Before installing manual transmission to the vehicle, check that each sliding surface slides smoothly by operating withdrawal lever. The fork should be able to freely move within the “window” where the concentric slave hydraulic piping was previously located, and should be able to touch the frontward and rearward edges of the window before the transmission is installed. The shims installed earlier should center the arc of the fork within its range of motion.

7. Remove two bolts from rear of transmission housing in the positions indicated below in figure 7.1 blocked out in blue (indicated by the arrows, not the dotted lines), the view facing from the vehicle forward. These two bolts are long, and the two bolts included in the kit to replace them are even longer, so it is advised to do this prior to reinstalling the transmission. Those with solid transmission mount may require removing the transmission support brace; those rubber or urethane mounts should be able to complete this step by simply pushing the brace out of the way.

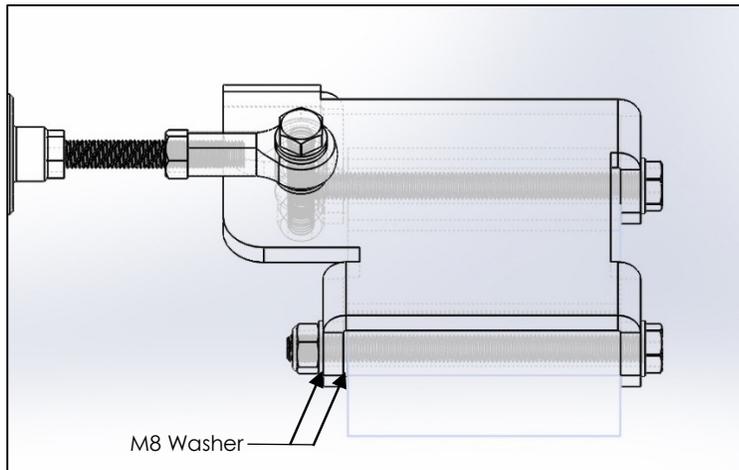
Install the main mounting bracket. Apply a small dab of the included thread locker at the 1/4 mark furthest from the head each supplied M8x1.25 110mm long bolt. Align all four holes of the mounting bracket and ensure that the bracket clears the dowel and casting ribs.

Insert an M8 washer between the bolt head and the mounting flange on the rearward side of the mounting bracket. Torque the bolts to **28 Nm (2.8 kg-m, 20 ft-lb)** to the internal threads of the transmission. Refer to figure 7.2 for reference of assembled bracket.

Insert an M8 washer between the flange of the mounting bracket and the transmission on the frontward side of the mounting bracket, and another washer between the M8x1.25 nut and the flange of the mounting bracket and transmission and torque both nuts to **28 Nm (2.8 kg-m, 20 ft-lb)**. Refer to figure 7.2 for reference of assembled bracket.



F7.1

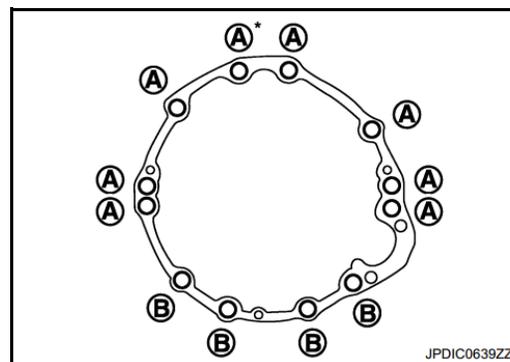


F7.2

**8.** Reinstall transmission in reverse order of removal. Tighten transmission assembly bolts to the specified torque. The figure is the view from the vehicle forward. See table 0.3 and figure 8.1 for details. Install transmission mounting brace.

**Table 0.3**

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)



F8.1

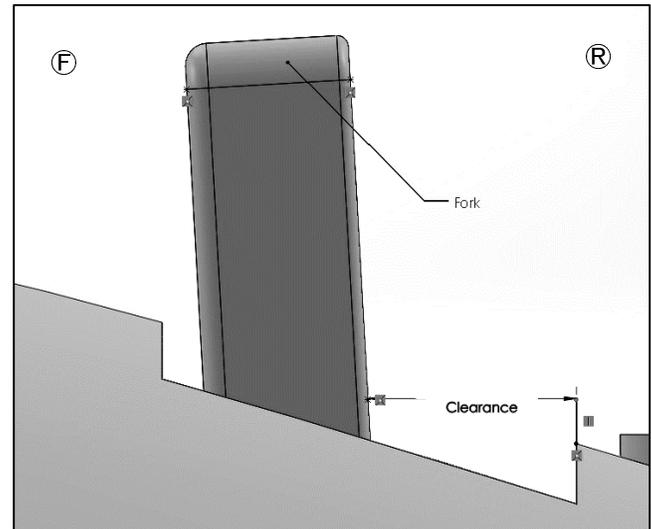
### 8. (continued)

Verify clutch fork position. With the pivot ball shimmed, the clutch fork should be freely able to hit the front of the “window” easily.

Typical clutch travel within the plane of the window is 9-12mm. If uncertain, please consult with the manufacturer of whatever clutch is being installed. Ensure that with the throw out bearing pressed against the fingers of the clutch that there is an additional 16mm to 18mm of clearance from the clutch fork to the rear of this window. See figure 8.2 for details.

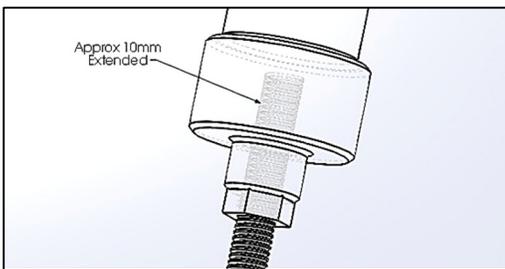
Improper clearance will not allow full engagement or disengagement of clutch, resulting in unnecessary wear and/or premature failure.

F8.2



### 9. Prepare the Howe Racing Pull Type Slave Cylinder and Subassemblies:

Pull the cylinder to full extension. The internal spring is preloaded, so it should likely be at full extension already. The cylinder should come preassembled as seen in figure 10.1. If not, proceed with the following.



F9.1

Remove bleeder fitting and line fitting from body. Use pipe thread sealant (liquid is strongly recommended) and tighten bleeder fitting from where the line fitting was removed, and tighten provided 90degree line fitting from where the bleeder fitting was removed, with the bend of the fitting facing the rear of the car.

Replace partially threaded rod on static side of cylinder with 80mm section of fully threaded rod, leaving approximately 10mm of thread extended inside the cylinder figure 9.1. Finger tighten jam nut against rearward housing of cylinder. Assemble the removed rod end with the included jam nut on fully threaded rod. Finger tighten.

#### Installation Note #8:

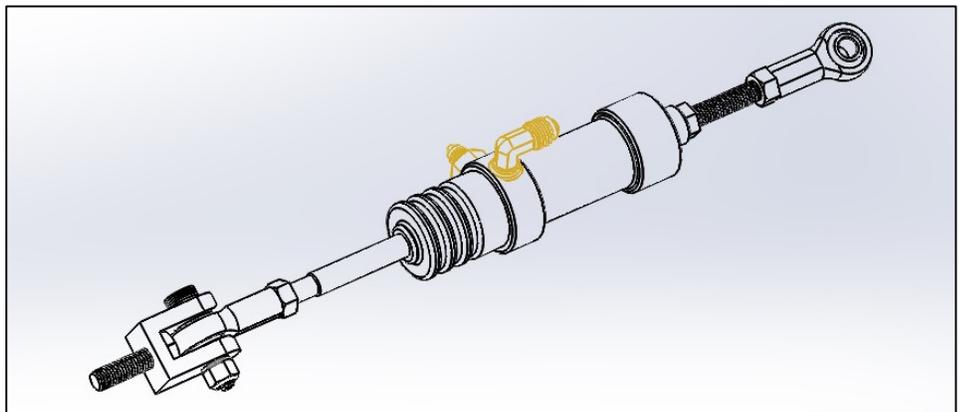
The rearward threaded sections of the cylinder will be used for clutch adjustment. The components may be tightened, but thread lock is not recommended until the final settings have been dialed in.

### 10.

Assemble clevis anchor components. Use a 0.5mm M8 clearance shim on either side of the rod end. Assemble using shoulder bolt and nyloc nut with thread locker, with a washer only under the nut. Tighten to 10 ft-lb. These components should be partially threaded together for shipping purposes.

Assemble, with thread locker on both the remaining jam nut and the threads of the rod end, the clevis anchor subassembly.

At this point, refer to figure 10.1 showing steps 9 and 10 cylinder preparation steps.



F10.1

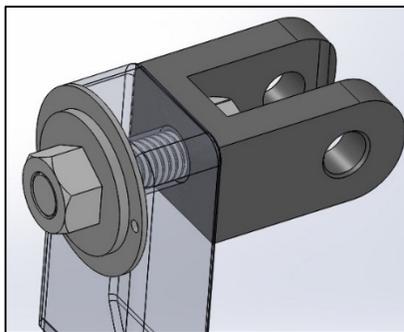
11. Using the supplied drilled wide-rim washer with an 8mm clearance washer, M8x1.25 nut, and thread locker, bolt the clevis anchor to the clutch fork, with the drilled wide-rim washer sitting against the face of the fork containing the dimple. Position so that the width of the clevis is in line with the width of the fork. **Tighten to 22 ft-lb.** Torque shoulder bolt to **10 ft-lb.** Reference figure 11.1.

12. Using four 8mm clearance washers, M8x1.25 40L bolt and M8x1.25 nuts, fasten rear rod end of cylinder to mounting bracket, using two washers between the rod end and mounting bracket. The components may be tightened, but thread lock is not recommended until the final settings have been dialed in. Refer to figure 12.1 for reference if needed. **Tighten to 22 ft-lb.**

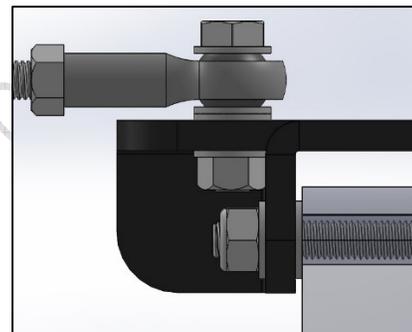
Remove the transmission bolt directly opposite of the fork. Install the wide-rim drilled washer. Align the holes of both drilled washers, and install the return spring. The spring should be extended to at least 10mm of preload, otherwise using a pair of pliers, introduce preload. Ensure that the spring is securely hooked into both wide rim washers. See figure 12.2 as the system should sit at this point in installation.

**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 12.2 as the system should sit at this point in installation.

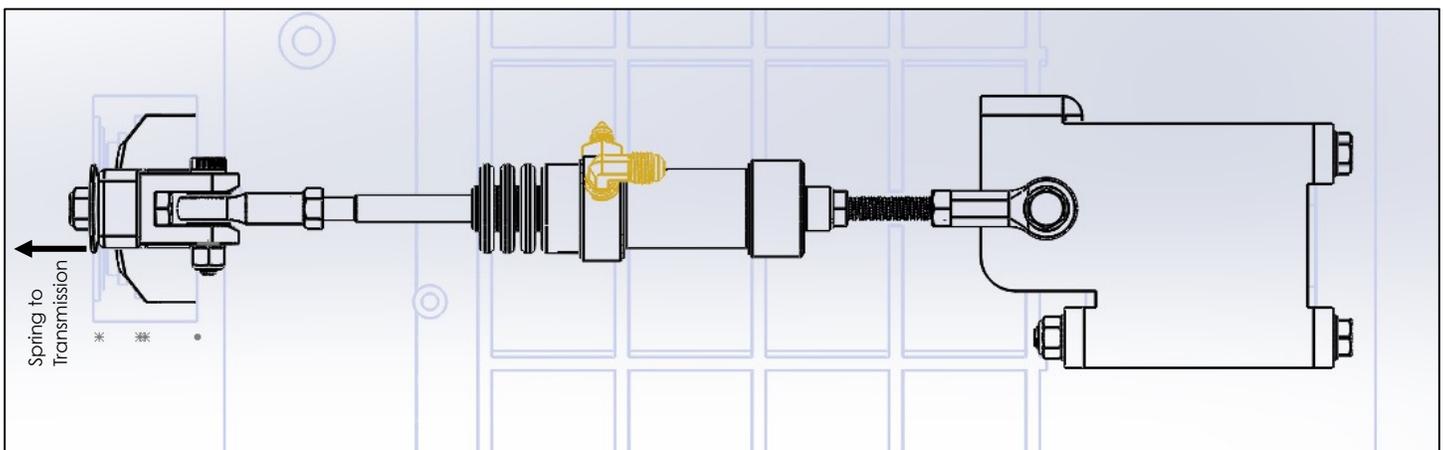


F11.1



F12.1

13. Install provided clutch line, using DOT4 fluid. Bleed clutch hydraulics and ensure proper function. Refer to CL-6 in FSM for further details. Ensure that at no time does the clutch fluid reservoir empty, as that will draw air into the hydraulic system. Ensure that no debris enters the hydraulic system. Do not reuse clutch fluid.



F12.2

**I4. Adjustment.** This kit will require adjustment in the clutch pedal and/or the clutch slave cylinder.

#### **Important: Adjustment Overview**

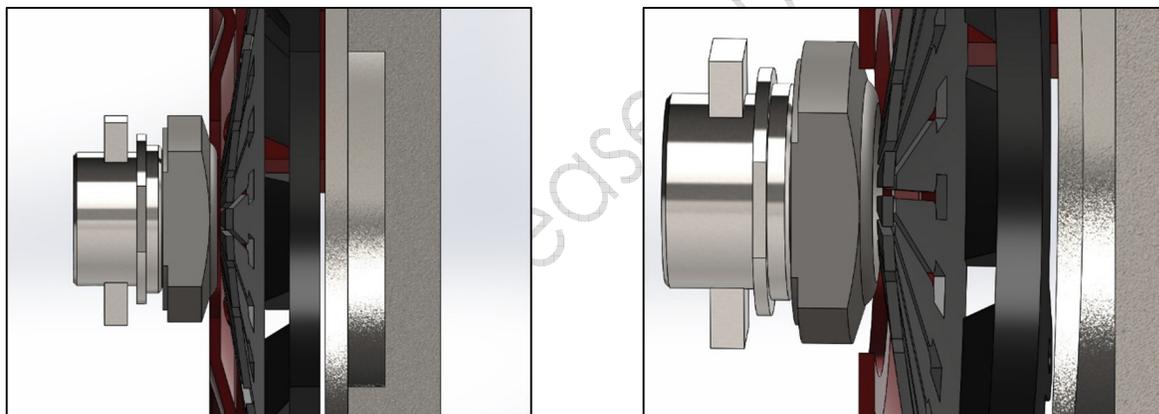
The most efficient method of adjusting the clutch system is to do so as follows, testing after each step for successful engagement and disengagement. Depending on the initial adjustment and specific clutch kit, some or all steps may need to be taken. A detailed guide will follow these overview steps.

1. Adjust Howe cylinder rearside threaded rod, ensuring proper gap of throw out bearing to clutch pressure plate.
2. Adjust pedal assembly clutch switches, ensuring proper dead pedal and clutch engagement point.
3. Readjust Howe cylinder rearside threaded rod if necessary.
4. Adjust clutch master cylinder clevis if necessary.

#### **Adjustment: Detailed Steps**

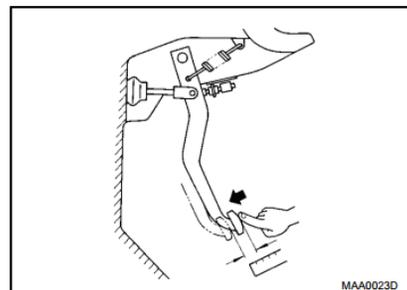
Begin by adjusting the overall length of the slave cylinder. This can be accomplished by lengthening or shortening the threads engaged in the rear/static body of the slave cylinder, and/or the threads engaged in the rod end. Ensure that when adjusted, the throw out bearing is NOT touching the fingers of the clutch pressure plate.

**Contact between the bearing and the pressure plate while the clutch is 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. See the following renders. This can be confirmed by both manually testing play by hand with the return spring and cylinder detached, or pressing the clutch pedal with the return spring and cylinder attached.**

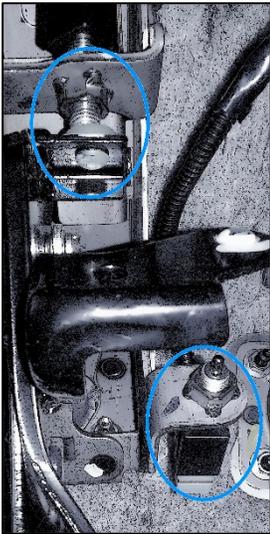


**I4. (continued)** Test clutch pedal feedback. There should be approximately 2.0-4.0mm of pedal free play when actuated by hand, pressing until certain rod is activated and can be felt. See figure I4.1 for reference.

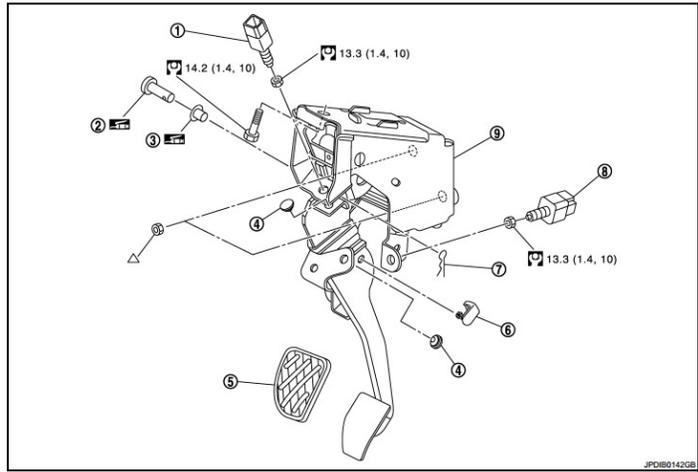
If needed, adjust the clutch pedal position (FSM CL-5). Loosen nuts locking the clutch pedal position switch (item 1) and clutch interlock switch (item 8) in figure I4.2 and I4.3, threading each to adjust. Tighten nuts to 10 ft-lbs upon reaching pedal position specifications.



F.14.1

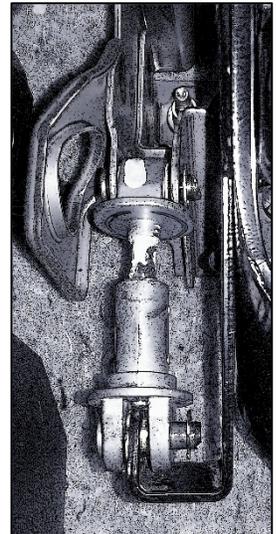


F14.2



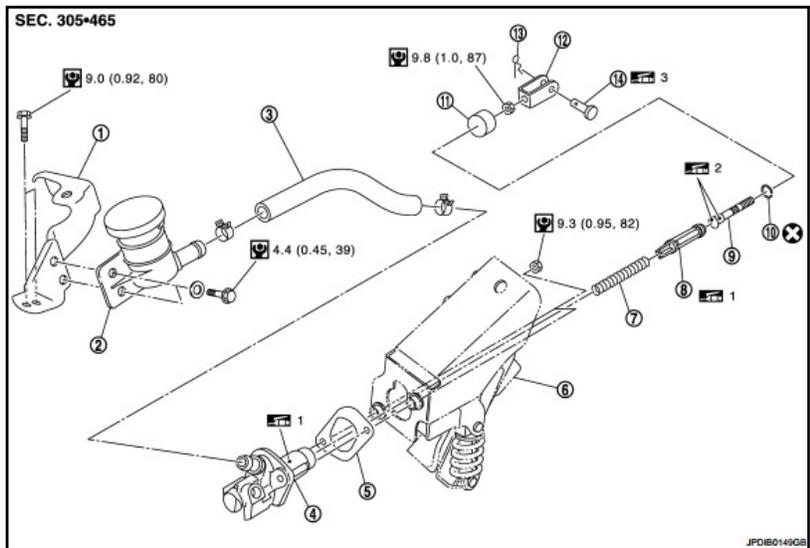
- |                                 |                            |                         |
|---------------------------------|----------------------------|-------------------------|
| 1. Clutch pedal position switch | 2. Clevis pin              | 3. Bushing              |
| 4. Stopper rubber               | 5. Pedal pad               | 6. Pedal stopper rubber |
| 7. Snap pin                     | 8. Clutch interlock switch | 9. Clutch pedal         |

F14.3



F14.4

**14. (continued)** If both the pedals and the slave cylinder have been adjusted and the proper hydraulic engagement is still not fully engaging or disengaging, a small adjustment to the master cylinder clevis may be required. Adjusting the master cylinder clevis will allow the cylinder to gain hydraulic leverage if the clutch is not engaging completely with a properly adjusted throw out bearing, or reduce the hydraulic leverage engagement point if the clutch is not disengaging completely. The below diagram shows an exploded pedal assembly diagram – refer to items 11-14 in the diagram below left for master cylinder clevis adjustment.

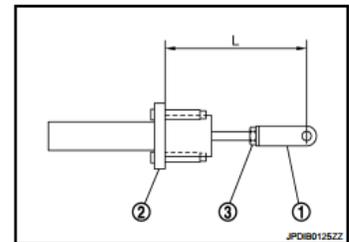


- |                    |                   |                 |
|--------------------|-------------------|-----------------|
| 1. Bracket         | 2. Reservoir tank | 3. Hose         |
| 4. Master cylinder | 5. Packing        | 6. Clutch pedal |
| 7. Return spring   | 8. Piston         | 9. Push rod     |
| 10. Stopper ring   | 11. Boot          | 12. Clevis      |
| 13. Snap pin       | 14. Clevis pin    |                 |

1: Apply rubber lubricant.

2: Apply silicone grease.

3: Apply lithium-based grease including molybdenum disulphide.



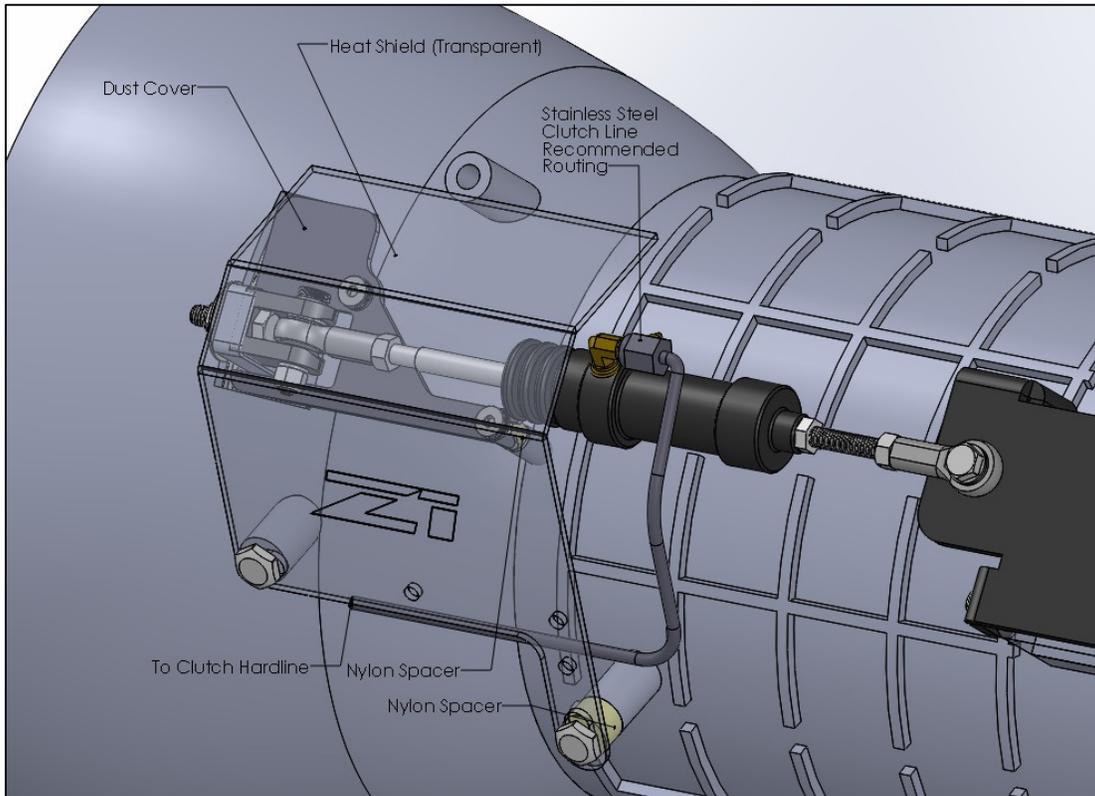
The diagram above designates the clevis (1), the master cylinder (2) and the lock nut (3), as seen from a side profile view.

Adjustment of the master cylinder increases or decreases the value of L, by loosening lock nut (3), and turning the clevis (1) along the threaded rod. Generally, start with a small adjustment on the order of a 0.5 turn.

### **Installation Note #10:**

Removal of the clutch pedal helper spring is mandatory for proper function (09+ vehicles only). Removal of the helper spring will introduce a somewhat stiffer pedal, but will help increase pedal clarity and resolution while reducing play. Simply remove the spring from the shaft assembly, and replace the shaft assembly. Refer to figure 14.4 for a removed spring and replaced shaft assembly.

After verifying proper pedal adjustment, verify again the air gap should be present between the contact point of the throw out bearing and the fingers of the clutch pressure plate. Have an assistant engage the clutch pedal several times while verifying adjustment. The fork should not touch either the front or rear of the window as described in step 8. If it does, remove the transmission and increase the shim height if it touches or near touches the rear of the window, decrease the shim height if it touches or near touches the front of the window.



F16.1

**15.** Using the provided M6 screws, washers and nylon standoff, install the fork dust cover (or the whale). Refer to figure 16.1 for further details.

**16.** Using the provided insulated straps and zip ties, install the heat shield, using the drilled holes to secure the clutch line. The heat shield will be bolted up against the transmission against the electrical connector bracket, reusing the bolt formerly fastening the electrical connector bracket. Use the supplied M10x1.5 35mm and nylon standoff to fasten the other hole on the heat shield. The heat shield will fasten parallel to the ground plane.

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. Refer to figure 16.2 for further details.

**17.** Reinstall any other components, hardware, and connectors that were removed during installation of this kit. Check transmission and clutch fluid levels, filling if necessary.

**18.** Crank the engine and inspect for any leaks. Row through ALL gears to ensure proper engagement. Readjust if necessary. Drive through ALL gears. Ensure that there is no difficulty shifting into any gears, or engaging the clutch in any gears. Readjust if necessary.

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.

Check this engagement/disengagement adjustment 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.

Release 1.0.3

**End**

**Additional Technical Support:**

For further information, feel free to contact ZIMotorsports at [info@zlmotorsports.com](mailto:info@zlmotorsports.com) or call 770 838 7777 between 9am and 6pm ET.

## **Troubleshooting:**

### **What symptom is the end-user experiencing?**

#### **Too much dead pedal/pedal slack?**

Check to make sure that there is air gap (but not too much, typically no more than 0.5-1.0mm). Adjust as necessary. If the problem persists, check that the clutch pedal switches were adjusted properly. Adjust if necessary, typically too much dead pedal will mean the switches need to be adjusted downward (i.e. in the direction of pushing the clutch pedal).

#### **Car will creep in gear with clutch pedal fully depressed?**

Clutch is not fully disengaged from the engine. Ensure that the clutch pedal is fully depressed when shifting. Ensure that there is an air gap between the throw out bearing and the clutch pressure plate fingers. Adjust the bottom clutch switch downward (i.e. in the direction of pushing the clutch pedal). Verify whether or not the clutch is now fully disengaged. If not or if the pedal hits the rubber stopper, proceed to adjust master cylinder clevis to increase hydraulic leverage/travel.

#### **Difficult to shift into gear/won't shift into gear with clutch pedal fully depressed?**

Clutch is not fully disengaged from the engine. Ensure that the clutch pedal is fully depressed when shifting. Ensure that there is an air gap between the throw out bearing and the clutch pressure plate fingers. Adjust the bottom clutch switch downward (i.e. in the direction of pushing the clutch pedal). Verify whether or not the clutch is now fully disengaged. If not or if the pedal hits the rubber stopper, proceed to adjust master cylinder clevis to increase hydraulic leverage/travel.

#### **Clutch pedal feels weird (non-linear, twitchy)?**

For 09+ models, removal of the clutch assistant spring is strongly recommended. Pre-09 vehicles do not require this modification, as the pedal geometry was revised and causes a more aggressive "camming" effect not seen pre-09.

#### **Interference with Transmission Front Cover/Stack height >90mm?**

In very rare scenarios in combining clutches and flywheels not designed for each other, the overall stack height will be higher than the acceptable range as allowed in the VQ transmissions. The typical limit of this stack height is 90mm – for heights taller than this value, there may be interference with the transmission front cover. It is generally recommended to use a properly designed and purposefully paired clutch and flywheel; however, for those that chose not to, call ZI Motorsports and replace the throw out bearing sleeve with a custom unit that addresses the issue.

#### **Clutch Requires Pumping to Engage/Disengage?**

Ensure that clutch hydraulics system is properly bled. Ensure that no air was ingested by master cylinder during initial drain/bleed/fill process. Ensure that clevis was not over adjusted, i.e. restricting the master cylinder refill port causing partial fluid blockage.

#### **Note:**

Typically, symptoms where one gear is problematic indicates a transmission issue, whereas symptoms where every gear is problematic indicates a clutch issue. Ensure that the proper fluid is being used (MT-85 is typically recommended for VQ 6MT applications) and that no pre-existing conditions are causing difficulties.

### **Additional Technical Support:**

For further information, feel free to contact ZIMotorsports at [info@zimotorsports.com](mailto:info@zimotorsports.com) or call 770 838 7777 between 9am and 6pm ET.