STOP! BEFORE INSTALLING THE RAM CONCEPT 10.5 DUAL, MAKE SURE YOU HAVE ADEQUATE SPACE IN YOUR BELLHOUSING FOR PROPER FIT!

DETERMINING IF THE RAM CONCEPT 10.5 WILL FIT IN YOUR APPLICATION

Before purchasing the RAM Concept 10.5 dual disc, you can easily measure to make sure the unit will fit properly in the vehicle. This will help you decide if you need to make any other changes to accommodate the clutch unit. Use the provided diagram to make your calculations.

CONCEPT 10.5 CLUTCH HEIGHT MEASUREMENT – 2.350" (ORGANIC), 2.400" (METALLIC)

1. MEASURE THE CRANK PROTRUSION – measure from the crank flange of the engine to the back of the block. If using a block saver plate, have this in place when measuring. ('A' on diagram)
2. MEASURE YOUR FLYWHEEL THICKNESS – measure the thickness of your flywheel from the crank flange to the friction surface. ('B' on diagram)
3. MEASURE BELLHOUSING DEPTH
    a. If using a MECHANICAL LINKAGE, install the transmission onto the bellhousing with a few bolts, install the clutch fork and release bearing. Retract the bearing completely and measure from the face of the bellhousing to the face of the release bearing. ('D' on diagram)
    b. If using an aftermarket HYDRAULIC BEARING, measure form the face of the bellhousing to the face of the hydraulic release bearing. ('D' on diagram)
    c. If using a FACTORY HYDRAULIC SLAVE CYLINDER, have someone hold the hydraulic slave bearing face fully retracted and measure form the face of the bellhousing to the face of the release bearing. This number is the 'available space' for the clutch system. ('D' on diagram)
4. FILL IN THE NUMBERS – Do the calculations at the bottom of the diagram. You are looking for a positive number in the 'Avail. Space' block.
5. If the minimum of .200" cannot be attained (negative number in 'available space' block), there are several methods to make the unit fit.
    a. Use an aftermarket hydraulic bearing – see RAM listing with this info packet
    b. Use a thinner flywheel – see RAM flywheel listing with this packet
    c. Space the bellhousing from the back of the block using a block saver plate
    d. Use spacers provided by the aftermarket transmission companies

Form C105-1

CALCULATING AVAILABLE SPACE FOR YOUR CONCEPT 10.5 CLUTCH SYSTEM

DETERMINING IF THE CONCEPT 10.5 CLUTCH WILL FIT YOUR APPLICATION

1. Measure and record dimensions 'A' (crank flange protrusion), 'B' (bearing compressed from the front of the bell-housing), and 'F' (flywheel thickness). Dimension 'C' is standardized for the Concept 10.5; use 2.350" for organic disc models, 2.400" for metallic disc models.

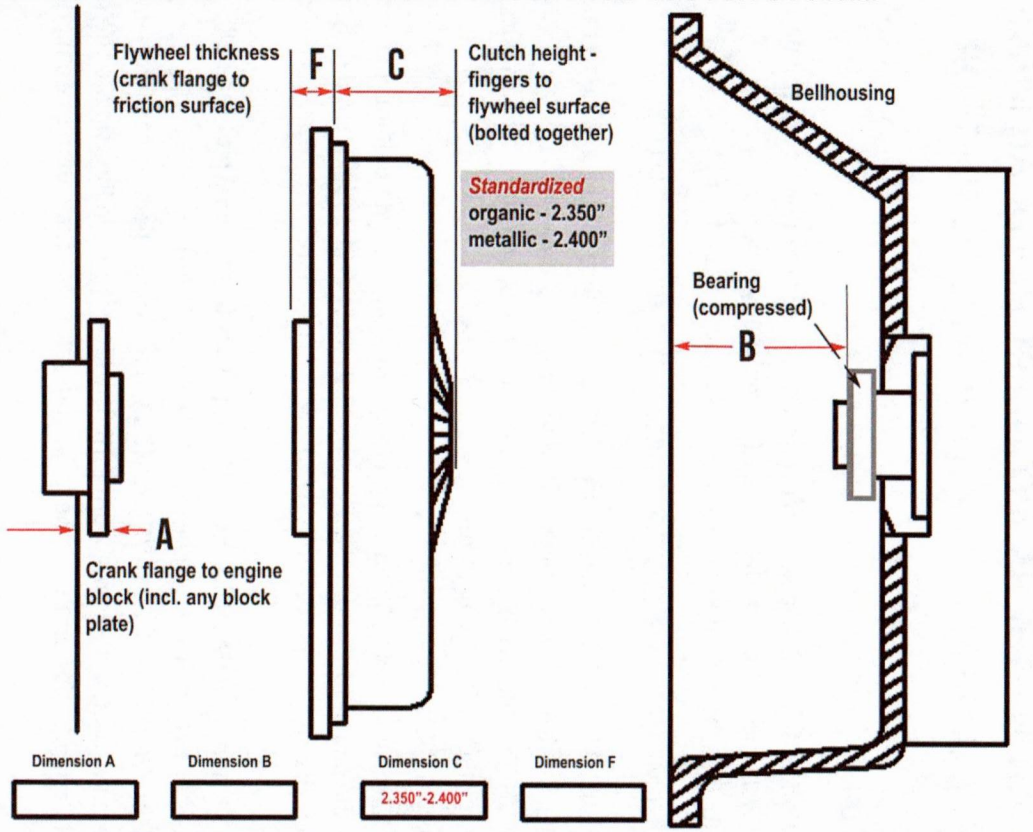
If you are using a mechanical release bearing, slide the bearing on to the input collar and take the 'B' measurement with the bearing flat to the back of the collar.

2. In the gray box, add dimensions 'A', 'C', and 'F' to determine the 'clutch height from the engine'.

3. Subtract 'clutch height from engine' dimension from dimension 'B' (bearing compressed). A positive number result indicates available space, or clearance. This clearance minimum should be .250" for mechanical or cable linkage applications, and .200" for RAM hydraulic bearing applications.

If you are unable to attain these minimum clearances, modifications will need to be made to increase space. This may include using a thinner flywheel, shorter release bearing, or spacing the bellhousing or transmission back.

NOTE: IF USING A RAM HYDRAULIC RELEASE BEARING WITH A CONCEPT 10.5, THE SNAP RING MUST BE REMOVED FROM THE FRONT OF THE BEARING PISTON.



IF YOU NEED TECHINCAL ASSISTANCE: You must provide this setup information in order for our technical department to assist you with any fitment questions. Make sure you provide the A, B, C, and D dimensions and email your questions to ramtech@ramclutches.com.

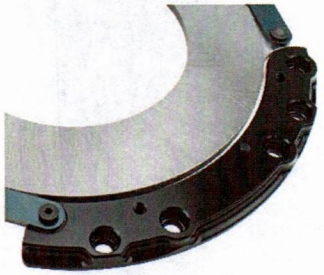
CONCEPT 10.5 DUAL DISC INSTALLATION INSTRUCTIONS

Congratulations on your purchase of the RAM Concept 10.5 Dual disc clutch system. Please completely read and carefully follow the setup instructions, and your new clutch with give you many miles of driving enjoyment.

BEFORE YOU BEGIN

COMPLETE THE FITMENT WORKSHEET – The Concept 10.5 is NOT in all cases a direct fit replacement. A worksheet is included to help you verify that the Concept 10.5 dual will fit within your bellhousing/release mechanism package. Do this step first to avoid surprises later during the install.

RAM always recommends the use of a SFI approved safety bellhousing and billet steel or aluminum flywheel.



Your RAM Concept 10.5 dual is factory preset for proper bottom and top disc gap on clutch release. **DO NOT remove the floater plate from the mounting stands.** If you do, make sure that any shims that are in place between the floater strap and ring are retained and reinstalled exactly as you received it. Failure to do so could result in non-release of the clutch and necessitate removal of the unit for correction.

Installing your RAM Concept 10.5 dual requires a flat flywheel. Some factory flywheels are stepped or recessed and will not be compatible. If your flywheel has dowel pins installed, you will need to remove these. RAM offers a complete line of billet steel and aluminum flywheels that are compatible with this clutch system. If you need a flywheel to complete your install please see the last page of the instructions or visit our website at http://www.ramclutches.com/flywheels.html.

Some aluminum flywheels have a raised insert, meaning the insert is not flush with the pressure plate mounting surface. Your RAM Concept 10.5 dual is set up for a completely flat flywheel so in this case, the flywheel will need to be resurfaced so this insert is flush.

ABOUT FLYWHEELS – keep in mind the job of the flywheel is to transmit inertia to help you get the car rolling on takeoff. Lighter flywheels may allow the engine to rev quicker on acceleration or deceleration, but have less mass and will require more slippage on takeoff to make a smooth transition. For the best driveability in primarily street driven vehicles, RAM recommends a steel flywheel.

ALWAYS USE A FRESHLY GROUND FLYWHEEL. NEVER INSTALL THE RAM CONCEPT 10.5 ON A NEW UNGROUND OR USED FLYWHEEL SURFACE!

ABOUT HYDRAULIC RELEASE MECHANISMS – ***If using a RAM hydraulic bearing, the snap ring must be removed!*** Use of an internal hydraulic release bearing requires precision measurement to determine the available space in the bellhousing, as well as set up the bearing with the proper gap to allow for wear over time. The RAM Concept 10.5 dual will function with factory internal hydraulic bearings PROVIDED the proper preload can be attained. RAM aftermarket hydraulic bearings are fully compatible with this clutch system ***(snap ring retainer must be removed)***, and are available for a multitude of transmission and vehicle combinations. For more info on RAM hydraulic bearings, visit our website at: http://www.ramclutches.com/

An informative video showing how to set up our dual disc units with the factory internal hydraulics is located at: https://www.youtube.com/watch?v=o-rKpvfb_og

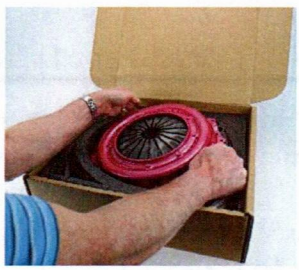
An installation video for RAM hydraulic bearings is located at: https://youtu.be/qrF0BBgSv4Y

ABOUT MECHANICAL RELEASE MECHANISMS – Most any mechanical release mechanism will function properly with the RAM Concept 10.5. An adjustable pivot ball will most likely be required in order to attain the optimum fork release angle for clean release and minimum pedal effort. Fork angle is critical – on applications with a driver side pivot location, the fork angle should be towards the front of the car with the bearing just touching the clutch fingers. For passenger side pivot, fork angle should be rearward.

UNPACKING THE CLUTCH SYSTEM

Remove the clutch system from the box. Remove the 6 – M8 bolts that retain the pressure plate to the modular stands and lift the pressure plate and top disc. DO NOT unbolt the 3 bolts that retain the floater plate to the stands.

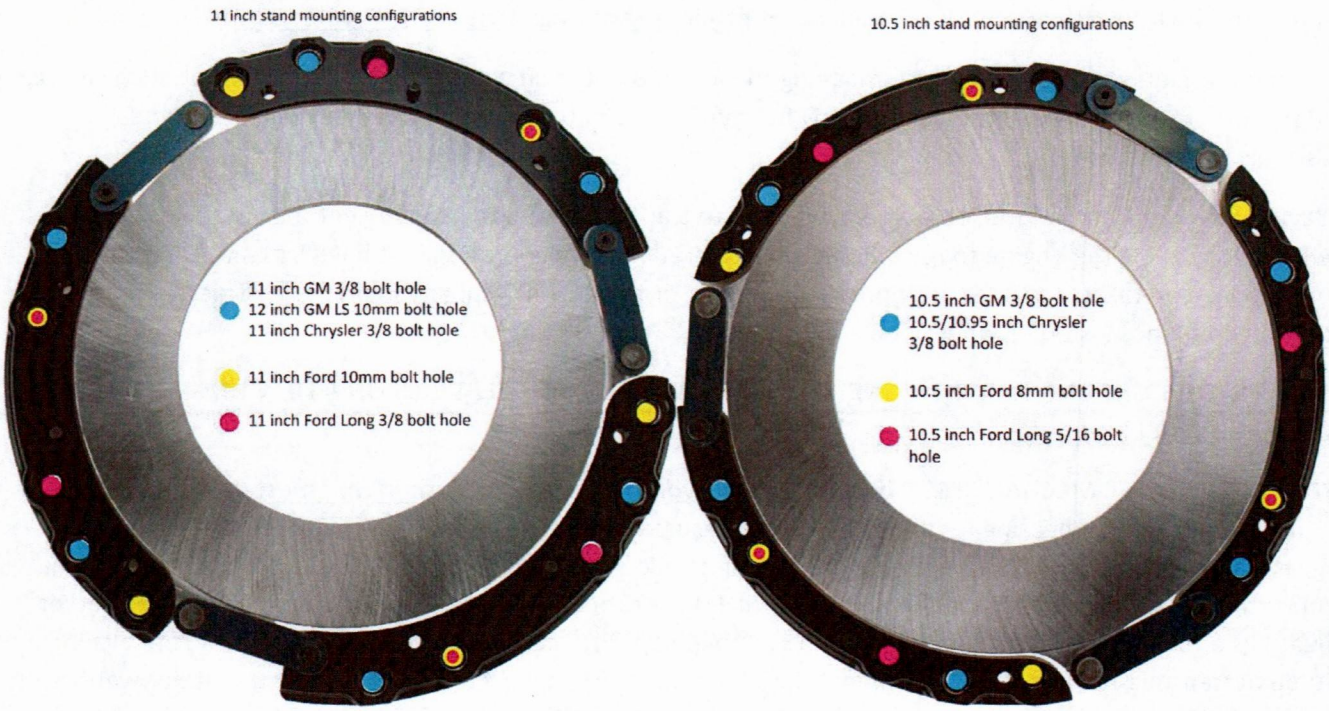
Concept 10.5 unit in box



removing assembly from box

Removing 6 – cover bolts

BOLT HOLE ALIGNMENT DIAGRAMS FOR THE MODULAR STANDS



BENCH SETUP OF THE CONCEPT 10.5 DUAL SYSTEM

Bench setup allows you to check all of the clutch components for proper fit on your flywheel, as well as the overall installed height of the clutch if you are using a hydraulic release bearing.

Set the flywheel on a bench, and place the bottom disc on the flywheel (fig a), followed by the modular stands/floater plate. Determine the proper hole pattern for the base ring using the hole guide on the previous page. Secure the stands/floater to the flywheel using the proper sized 6 mounting bolts that match your flywheel thread size (fig b).

Fig. a

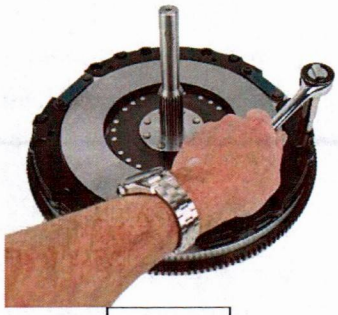


Fig. b

Fig. c

Place the top disc, sprung hub side up, on the floater plate (fig. d), and install the cover assembly. Tighten the bolts USING HAND TOOLS ONLY, in a criss cross pattern, 2 or 3 turns at a time until the plate draws down flat to the base stands (fig. e). Have an assistant hold the complete unit while you torque the cover bolts in place (26 ft/lbs for 8mm x 16 bolts)(fig. f). **NOTE – for 900 series disc models, pads should be aligned on top of each other (fig. c).**

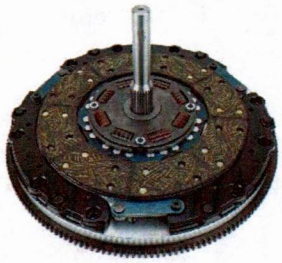


Fig. d

Fig. e

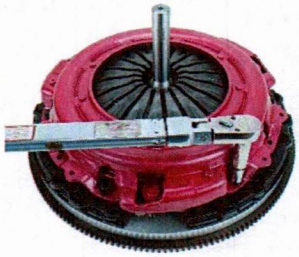
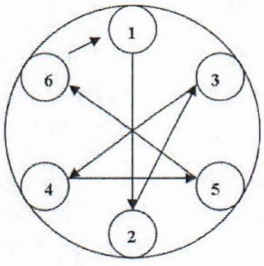


Fig. f



Proper torque sequence for cover bolts

SETTING UP FOR FACTORY OR AFTERMARKET HYDRAULIC RELEASE MECHANISMS

A HYDRAULIC SETUP SHEET IS INCLUDED WITH YOUR CONCEPT 10.5 DUAL FOR FACTORY HYDRAULICS. *IF YOU ARE INSTALLING THIS CLUTCH WITH A RAM HYDRAULIC BEARING, USE THE SETUP SHEET INCLUDED WITH THE RAM BEARING.* ***THE STANDARD CLUTCH HEIGHT FOR THE ORGANIC EZ-DUAL IS 2.350", METALLIC 2.400".***

At this point you have the clutch assembled just like it will be on the engine. Set the entire assembly on a flat base so that it is sitting directly on the flywheel crank flange. Using a dial caliper, measure from the clutch fingers down through the discs and flywheel, so the probe stops on the base you have set the flywheel on. Take this measurement several times to settle on an average and write this number down on your included hydraulic setup sheet.

Now you can take the remaining measurements on the setup sheet. Be careful in taking these measurements as they are critical to the proper setup of your hydraulic bearing. Make the calculations to determine preload or bearing gap, depending on which hydraulic system you are using. Follow the video guides listed above for complete details on this setup.

For factory internal hydraulic slave/bearings, RAM recommends a minimum of .550" preload, and a maximum that is .250" less than the fully compressed dimension of the factory slave (ex, if the total travel range of the factory bearing is .980", .730" should be the maximum preload.) **If the maximum preload is more than the .250" minimum, an aftermarket hydraulic bearing or shorter aftermarket flywheel will be required for your application.**

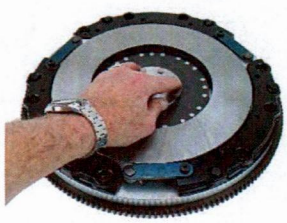
INSTALLING THE RAM CONCEPT 10.5 DUAL ON YOUR ENGINE

Now that you have made the necessary pre-checks to insure a smooth installation, proceed to installing the unit on your engine.

Install the flywheel to the engine and torque to the appropriate value for the fasteners used, using the same method as above.

Using a quality alignment tool, install the solid hub first disc on the flywheel. RAM billet alignment tools are extremely accurate and allow you to insert the tool and progressively load the clutch pack while maintain proper alignment, as well as make installation of the transmission easier when you get to that point. See the included accessory card for RAM alignment tool part numbers.

Place the stand/floater assembly onto the flywheel and insert the 6 mounting bolts, using blue Loctite or similar thread sealant, and tighten hand tight. Torque the 6 bolts in place, using a criss cross pattern, to the appropriate values (26 ft/lbs for 5/16 or 8mm bolts, 32 ft/lbs for 3/8 or 10mm bolts.)



AT THIS POINT, YOU SHOULD BE ABLE TO FREELY MOVE THE BOTTOM CLUTCH DISC USING THE ALIGNMENT TOOL OR BY HAND. IF THE CLUTCH DISC IS TIGHT, STOP! CONTINUING THE INSTALL WILL CAUSE NON RELEASE AND REQUIRE THE JOB TO BE DONE OVER. YOU MUST DETERMINE WHY THE BOTTOM DISC IS TRAPPED, AND CORRECT THIS BEFORE MOVING ON. THE MINIMUM GAP BETWEEN THE FLOATER PLATE AND DISC SHOULD BE .015-.020". IF YOU ARE UNSURE, CONTACT RAM TECHNICAL ASSISTANCE BEFORE PROCEEDING.

After verifying that the bottom disc is free, slide the top disc over the alignment tool, sprung side out. Place the pressure plate in position and start the 6 mounting bolts in by hand. Using hand tools ONLY, tighten the pressure plate in a criss cross pattern, 2 or 3 turns at a time, until the cover is tight to the base stands. Torque the cover bolts to the appropriate values (26 ft/lbs for 5/16 or 8mm bolts, 32 ft/lbs for 3/8 or 10mm bolts.)

When complete, the alignment tool should easily slide in and out of the clutch discs. If it does not, you will have difficulty installing the transmission. Loosen the cover bolts and realign the clutch pack, then repeat the tightening procedure until the alignment tool moves in and out freely.

INSTALL REMAINING NECESSARY COMPONENTS

If you do not have a service manual for your vehicle and this is your first clutch install, we strongly recommend reviewing these procedures prior to installing the RAM Concept 10.5 dual.

Complete the install using clutch installation instructions for your specific vehicle to the point that all drivetrain parts are in place and the clutch release can be checked. Hold off on reinstalling exhaust and other components until you are certain the clutch is releasing properly using the procedure below.

TESTING FOR PROPER RELEASE

If you are using a hydraulic release system, bleed the system completely. For mechanical linkage applications, pre-set the release rod so that you are allowing approximately ¼ inch of clearance between the release bearing and clutch fingers.

With the rear of the car elevated and in gear, have an assistant push the clutch pedal down while you check that the rear wheels will turn. If they do not turn loose, re-adjust the linkage so the bearing is closer to the fingers (mechanical linkage) or check to make sure you have a complete bleed on the hydraulic system.

To fine tune mechanical linkage, have your assistant slowly let up on the pedal while you turn the rear wheels, and have them note the pedal position at the point that you can no longer turn the wheels. Re-adjust and re-run this test until you have the maximum amount of bearing freeplay possible, and still are able to get the wheels to turn freely when the pedal is depressed. Ideally the engagement point will be 1-2 inches off the floor.

FINAL ASSEMBLY

Once you are certain the clutch is engaging and disengaging properly, re-install the remaining components such as exhaust, etc. to complete the job.

BREAK IN

The hard work is done, now the fun begins! Don't be too quick to test the maximum holding capability of your new clutch. Breaking in a clutch is a lot like breaking in new brake pads. The discs need heat cycles as well as engagements/disengagements to allow the discs to properly seat. Give the system at least three complete heat cycles warm to cold. Allow between 200 and 500 miles for full seating before you pour the steam to it!

RELATED ITEMS FOR YOUR RAM CONCEPT 10.5 CLUTCH SYSTEM INSTALL

GM

STEEL FLYWHEELS	
Chevy to 86 168 tooth '0' bal. 25 lbs.	1501LW
Chevy 86-up 153 tooth 'ext' bal. 28 lbs.	1509
Chevy 86-up 153 tooth 'ext' bal. 28 lbs.	1512
Chevy to 86 153 tooth '0' bal. 28 lbs.	1511
Chevy to 86 153 tooth '0' bal. 28 lbs.	1510
Chevy to 86 168 tooth '454' bal. 25 lbs.	1521LW
Chevy to 86 168 tooth '400' bal. 25 lbs.	1523LW
Chevy 86-up 168 tooth 'ext' bal. 25 lbs.	1530LW
Chevy 86-up 168 tooth '0' bal. 25 lbs.	1531LW
GM LS 6 bolt 168 tooth '0' bal. 28 lbs.	1550
GM LS 8 bolt 168 tooth '0' bal. 28 lbs.	1558
Pontiac 2.75" crank 166 tooth '0' bal. 33 lbs.	1557

RELEASE BEARINGS/ACCESSORIES	
Steel alignment tool 1 1/8-10	03-001
Steel alignment tool 1 1/8-26	03-013
GM short mechanical release bearing	488
Hydraulic bearing, univ. 1.375" center 1.75" min ht.	78125HD
Hydraulic bearing, GM Tremec 5 speeds	78131
Hydraulic bearing, universal T56/TR6060 6 speeds	78160
Hydraulic bearing, 98-02 F-body, 97-04 C5 Vette	78165
Hydraulic bearing, 05-13 C6 Vette	78170
Hydraulic bearing, 10-up Camaro	78180
Pedal height adjuster	78300
Flywheel bolt set 7/16 x 1	575
Flywheel bolt set LS 6 bolt	528
Flywheel bolt st LS 8 bolt	528-8

FORD

STEEL FLYWHEELS	
Ford SB 164 tooth '28 oz/in' bal. 26 lbs.	1505LW
Ford SB 164 tooth '0' bal. 26 lbs.	1507LW
Ford SB 157 tooth '50 oz/in' bal. 26 lbs.	1525
Ford SB 157 tooth '28 oz/in' bal. 26 lbs.	1527
Ford SB 157 tooth '0' bal. 26 lbs.	1529
Ford mod 6 bolt 164 tooth '0' bal. 25 lbs.	1540LW
Ford mod 8 bolt 164 tooth '0' bal. 25 lbs.	1545LW
Ford BB 184 tooth '0' bal. 33 lbs.	1519
Ford BB 184 tooth '28 oz/in' bal. 33 lbs.	1518

RELEASE BEARINGS/ACCESSORIES	
Steel alignment tool 1 1/16-10	03-004
Steel alignment tool 1 1/8-26	03-048
Ford early clip style release bearing 1 1/16-10	485
Ford late slot style release bearing 1 1/16-10	501
Hydraulic bearing, Ford Tremec 5 speeds	78131
Hydraulic bearing, Ford Toploader	78136
Hydraulic bearing, T56/TR6060 05-up Mustang	78175
Flywheel bolt set 7/16 x 1	575
Flywheel bolt set 10mm 6 bolt	529
Flywheel bolt set 10mm 8 bolt	529-8

CHRYSLER

STEEL FLYWHEELS	
6 bolt crank, 130 tooth, '0' bal. 30 lbs.	1503
8 bolt crank, 130 tooth, '0' bal. 30 lbs.	1583
6 bolt crank, 143 tooth, '0' bal. 33 lbs.	1595
8 bolt crank, 143 tooth, '0' bal. 30 lbs.	1593
Late Hemi 130 tooth, '0' bal, 30 lbs.	1585
Late Hemi to early 4 sp, 130t, '0' bal 30 lbs.	1588

RELEASE BEARINGS/ACCESSORIES	
Early style clip release bearing, 1-23 spline	483
Early clip style release bearing, 1 3/16-18 spline	482
Hydraulic bearing for Tremec transmissions	78134
Flyhweel bolt set 7/16 x 1	575
Flywheel bolt set 1/2 x 1 8 bolt	596

FOR FURTHER INSTRUCTIONS, VIDEOS, AND TECHNICAL INFORMATION PLEASE VISIT OUR WEBSITE AT RAMCLUTCHES.COM.

RAM CLUTCHES

201 BUSINESS PARK BLVD.

COLUMBIA, SC 29203