SARGENT's 5100 & 6300 Series Removable Core Pinning Manual

SARGENT manufacturers two types of Removable Core products. Each is based on a different assembly concept. The first version (5100) series of the removable core was based on using a seventh position on the control key and in the core. All other operating keys are cut on six-pin length key blanks. This longer key blank for the Control key is what activates the control lug releasing the core from the housing. This version is similar to the Schlage version of the removable core. A five-pin version of this product was also available.

The current version of SARGENT's removable core (6300) uses a sleeve that spans the 3rd and 4th chambers of the core. All key blanks are of the same length. This version is similar in concept to many of the manufacturers of this type product.

5100 Series

The Control key for this version is cut on a seven-pin length key blank. The bitting cuts for the first six positions on the key blank is the same as the TMK bitting developed for master keying system. The bitting depth in the seventh position is a constant number and is used to activate the shear line of the control lug positioned at the back of the cylinder. This allows removal of the core from the housing. The 5-pin version had a six-pin key blank for the Control key and all other keys were 5-pin blanks with a "0" cut on the slope of the key tip.

All Master level and Day/Change keys have a common number on the slope of the key tip. The pins and drivers used in the pin stack of the sixth (5-pin) or seventh (6-pin) position are always the same. Page 32 shows examples of Key Bitting and the pinning matrix for a 5 and 6-pin core.

The 5100 series removable core is only available for Mortise and Rim cylinders and is currently furnished only for additions to existing key systems.

6300 Series

The current version of the 6300 series Removable Core uses a control key whose bittings match the TMK (Top Master Key) of the key system in positions 1, 2, 5, and 6 of the key. The control bittings in positions 3 and 4 are selected from the KBA (Key Bitting Array) of the master key system.

This method significantly reduces the bittings available in the KBA of any TMK. Increasing the levels in the master keying system and cross keying also has a significant impact on the yield of keys at each selected level.

The chamber stack value for the 6300 series removable core in normally calculated at using a stack value of 15 in positions 1, 2. 5, and 6. This is the total value of the pin segment numbers for the Bottom pins, Master slits and Driver pins that would be required (based on the keying levels) to pin the core.

In chambers 3 and 4 of the 6300 series removable core the stack value is 20. This is done to include the required pin segment in chambers 3 and 4 that allow the control key to achieve a shear line in the control sleeve.

SARGENT requires the use of hollow drivers in chambers 3 and 4. There is also a different spring used in conjunction with the hollow drivers. These special drivers and springs may be obtained by ordering a special pinning kit "UL437 RC/UL" or the driver's and springs can be ordered individually.

5100 Series Old Style Removable Core

Operation: The logic for this feature is similar to the SARGENT's Mortise Lock Hotel Emergency Keying. A sleeve is inserted over the barrel at the back of the cylinder and is activated by the control key in the assembly core.

The bitting on the control key raises the bottom pins to achieve a shear line in the control sleeve. This allows the control sleeve to rotate and allows removal of the core.

When any other operating key is inserted it allows the driver pin to drop into the control sleeve locking the control sleeve in place and preventing the control sleeve from being moved to a position to allow removal of the core from the housing.

5100 Series Old Style Removable Core (6 Pin)

Keying: This six-pin version of this type of removable core system utilizes a seven-pin length key blank for the control key.

The control bitting in the 7th position, (the cut closest to the tip of the key) is always #3 bitting!

All operating keys (change/master/grand master etc.) are bitted on six pin blanks.

All operating keys have the standard six cuts in positions one trough six.

A #7 cut is made on the slope at the very end of every operating key's blank.

In essence we are cutting seven bittings on a six-pin blank.

The following represents a typical key bitting selection for a level 2 (simple master key) six-pin version.

CTR key--------- 2 3 6 9 3 4 3
MK ---------- 2 3 6 9 3 4 7
CK---------- 4 1 2 1 3 4 7
The removable core would be pinned;
Drivers --------- 11 12 9 6 12 11 11
Master Pins----- 2 2 4 8 - - 4
Bottom Pins---- 2 1 2 1 3 4 7
The pin load as defined in position seven is always the same.
A #7 bottom pin, a #4 master pin, and a #11 top pin.

**Note: A special half spring (factory part # 13-0215) is used in the control chamber of both the five and six pin versions of the 5100 series cores.

5100 Series Old Style Removable Core (5 Pin).

The five-pin version of this type of removable core system utilizes a six-pin length key blank for the control key.

The control bitting in the 6th position, (the cut closest to the tip of the key) is always #6 cut.

All operating keys (change/master/grand master etc.) are bitted on five pin length key blanks.

All operating keys have the standard five cuts in positions one through five.

A #0 is cut on the slope at the tip of the key of every operating key's key blank.

In essence we are cutting six bittings on five pin key blanks.

CTR key--------- 2 3 6 9 3 6
MK ---------- 2 3 6 9 3 0
CK---------- 4 1 2 1 3 0
The removable core would be pinned;
Drivers --------- 11 12 9 6 12 8
Master Pins----- 2 2 4 8 - 4
Bottom Pins---- 2 1 2 1 3 10
The pin load as defined in position six is always the same.
A #10 bottom pin, a #4 master pin, and a #8 top pin.

**Note: A special half spring (factory part # 13-0215) is used in the control chamber of both the five and six pin versions of the 5100 series cores.

6300 Series

The following diagrams can be used to determine the pin segments for the SARGENT 6300 series Removable Core.

The first step is to determine the bottom pin and master wafers needed in each chamber to make all operating keys functional in the core. Operating being all keys (Change/day, MK's, GMK's, etc.) except the control key.

Calculating pin sizes required from these keys in the removable core is done using the same methods that are used in selecting the correct pin segment sizes in any standard pin tumbler type cylinder.

- Determine the smallest number that occurs in each chamber for all the keys that are to operate the core. This will yield the bottom pins required for the core.
- Next calculate whatever additional combination wafers will be needed in each chamber to allow all the operating keys to pass the core.

Once this is accomplished the next step will be determinate the pins that will activate the control sleeve in positions three and four of the core. This can be accomplished as follows.

- Add the number 8 to the bitting cut in the third and fourth position of the control key to obtain what can be referred to as the "control pin factor".
- From this "control pin factor", subtract the largest bitting cut in the third and fourth position of all operating keys.
- The numbers resulting from this calculation are the numbers of the master wafers that are added to the pin stack in the third and fourth chambers of the core.

The last step is to determine the size of the driver pin for each of the core chambers.

1. The total stack value of chambers one, two five, and six is fifteen.
2. The total stack value of chambers three and four is twenty.
3. Add the numbers of the bottom pin, master wafers and control pin in each chamber.
4. Subtract the resulting value in step 3 from the total size of 20 in each chamber to determine the correct size master wafer to be used as the driver.

- Next calculate whatever additional combination wafers will be needed in each chamber to allow all the operating keys to pass the core.

6300 Series Example

The following is an example showing how to select the pin segment for each chamber of the SARGENT 6300 series removable core

1) List of Operating Keys

	Key Symbols	**Bittings**
List Day Chnes/MK's GMK's etc.	GM "A"	4 9 4 1 6 0
Do Not list bitting of.	MK "AA"	4 9 2 3 6 0
The Control key is this area	CK "AA1"	2 1 2 3 2 2

2) Calculate Bottom Pins and Master Splits
Find correct Size for Bottom and Master Splits from Operating Key List

(a)	***** BOTTOM PINS ****** (Smallest Number in Each Chamber)	2 1 2 1 2 2
(b)	***** MASTER SPLITS ****** (Difference in Smallest and Largest Number in each chamber)	2 8 2 2 4 8

3) Calculate Value of Control Splits

		Control Key Bitting 4 9 6 5 6 0
(3.1)	A number 8 appears on this line in positions 3 and 4	8 8
(3.2)	Insert Bitting of positions 3 and 4 of Control Key) and Add to number 8's in positions 3 and 4.	+6 +5
	*Control Pin Factor. =	14 13
(3.3)	Subtract Largest Number in Positions 3 and 4 From List of Operating Keys from Control Pin Factor	-4 –3
(3)	***** CONTROL SPLITS *****	= 10 10

4) Calculate Top or Driver pin. TOTAL STACK VALUE 15 15 20 20 15 15

(4.1) Add Value of: ((a) Bottom Pins, + (b) Master Splits + (3) Control Splits). Enter total here. 4 9 14 13 6 10

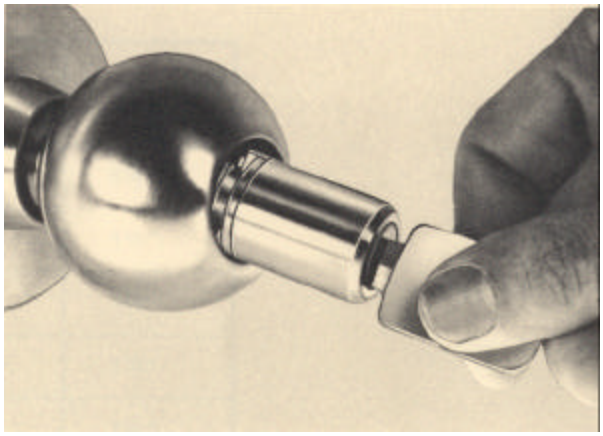
(4.2) Subtract total from TOTAL STACK VALUE above " " " " " "

(d) (4.3) Enter values on this line DRIVER SPLITS (Master Splits) 11 6 6 7 9 5

5) Pinning Assembly Matrix **Example of pinning matrix for above key bittings.**

Transfer Values Labeled (a), (b), (c), (d) from items 2), 3), and 4) above

(d) Driver Splits	11	6	6	7	9	5
(c) Control Splits	--	--	10	10	--	--
(b) Master Splits	2	8	2	2	4	8
(a) Bottom Pins	2	1	2	1	2	2
Stack Total	15	15	20	20	15	15



Sargent Keso Removable Core Cylinder

6300 Series

This form can be used as a template to create additional forms for calculating the correct pin loads for the SARGENT 6300 series removable core. Simply follow the instructions in each section of the form.

1) Enter List of Operating Keys (All Day, Master, Grand Master Keys, etc.)

Do Not list Bitting of the control key in this area.

Key Symbols	Bittings
	-

2) Calculate Bottom and Master Pins

(a) ******* Bottom Pins **********

(Smallest Number in Each Chamber)

(b) ******* Master Splits **********

(Difference in lowest to highest value in each chamber)

3) Calculate Value of Control Pin. (3.1) **Insert Control Key Bitting**

Control Additive (Fixed Value) - - 8 8 - -

(Fill numbers only I chamber 3 and 4)

(3.2) Control Bittings + Additive -

(3.3) Control Pin Factor =

(3.4) Subtract Largest Number in list of Operating Key =

(c) * * * * * * * * Control Splits * * * * * * * * * * = - - -

4) Calculating Driver Pin. **Total Stack Value =** 15 15 20 20 15 15

(4.1) Add Value of:
(a Bottom Pins, + b Master Splits + c Control Splits)
(4.3) Enter this line. Subtract from Total Stack Value Above.

(d) * * * * * * * * Driver Pins * * * * * * * * =

5) Pinning Assembly Matrix

Insert Values from (a), (b), (c) and (d) from items 2), 3), and 4) above.

(d) Driver Pins……

(c) Control Pins……..

(b) Master Splits…….

(a) Bottom Pins……..

Bitting Cut Depth of Control Key (3rd and 4th Pin Positions Only)

Bitting Cut Depth of Master Or Day Key (3rd and 4th Pin Positions Only)

	1	2	3	4	5	6	7	8	9	10	Pin Load
1			1 10 9		1 12 7		1 14 5				Bottom Pin Master Pin Top Pin
2				2 10 8		2 12 6		2 14 4			Bottom Pin Master Pin Top Pin
3	3 6 11				3 10 7		3 12 5		3 14 3		Bottom Pin Master Pin Top Pin
4		4 6 10				4 10 6		4 12 4		4 14 2	Bottom Pin Master Pin Top Pin
5	5 4 11		5 6 9				5 10 5		5 12 3		Bottom Pin Master Pin Top Pin
6		5 4 10		6 6 8				6 10 4		6 12 2	Bottom Pin Master Pin Top Pin
7	7 2 11		7 4 9		7 6 7				7 10 3		Bottom Pin Master Pin Top Pin
8		8 2 10		8 4 8		8 6 6				8 10 2	Bottom Pin Master Pin Top Pin
9			9 2 9		9 4 7		9 6 5				Bottom Pin Master Pin Top Pin
10				10 2 8		10 4 6		10 6 4			Bottom Pin Master Pin Top Pin

Loading 6300 Removable Core Cylinders

In loading 6300 cylinder, the pin positions 1,2,5 and 6 can be determined and loaded in the conventional way (stack height of 15 total) – but loading pin positions 3 and 4 (stack height of 20) must be calculated using the following method in conjunction with the loading chart. On page 34 of this issue.

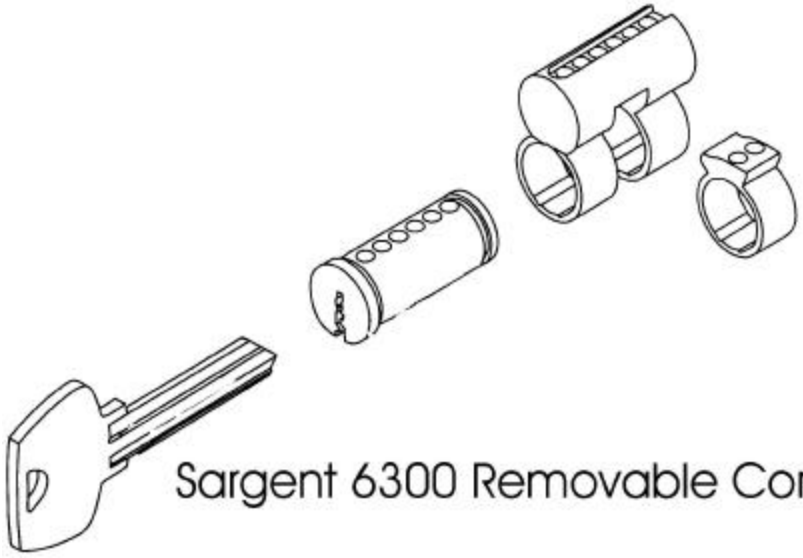
First, assume for this example that we have a MK with bittings HA438567, a Control key with bittings HA434767 and a Change key, aa1 with bittings HA436349. the MK has been broken down using positions 3,4,5 and 6. we are to determine the loading on the AA1 cylinder.

Determine the deepest cut of the MK or Change key (or any other key which is to operate this cylinder i.e. Cross keyed changes) in the 3rd and 4th positions. In this example this would give 8 for the 3rd position (from the MK) and 5 for the 4th position (also from the MK).

For the 3rd position, find the 8 in the left hand column of the chart and read across under the value for the 3rd position of the Control key – a 4 in our example. In the intersecting cell of the chart we are given the total load for the Bottom pins, 8, the loading Master pin, 4 and the Top pin load 8, giving a total of 20. The loading of the 8 fro Bottom pin must, of course catch both the Change key and the MK so in our example the Bottom pin must be a 6 to catch the Change key with a 3 split to catch the MK. (Any other operating keys would also need to be picked up in the breakdown of this Bottom pin load). The Master pin of 4 and the Top pin of 8 are then added.

Similarly, for the 4th position, find the 5 in the left hand column and read a cross under the value for the 4th position of the Control key – a 7 in our example. In the intersecting cell of the chart we are given a total load for Bottom pins of 5, the loading for the Master pins is 10 and the Top pin load is 5. Here the total Bottom pin lead of 5 must be broken down to catch the Change key value in this position, a 3, and must then have a 2 split to catch the MK. The Master pin load of 10 and Top pin load of 5 are then added.

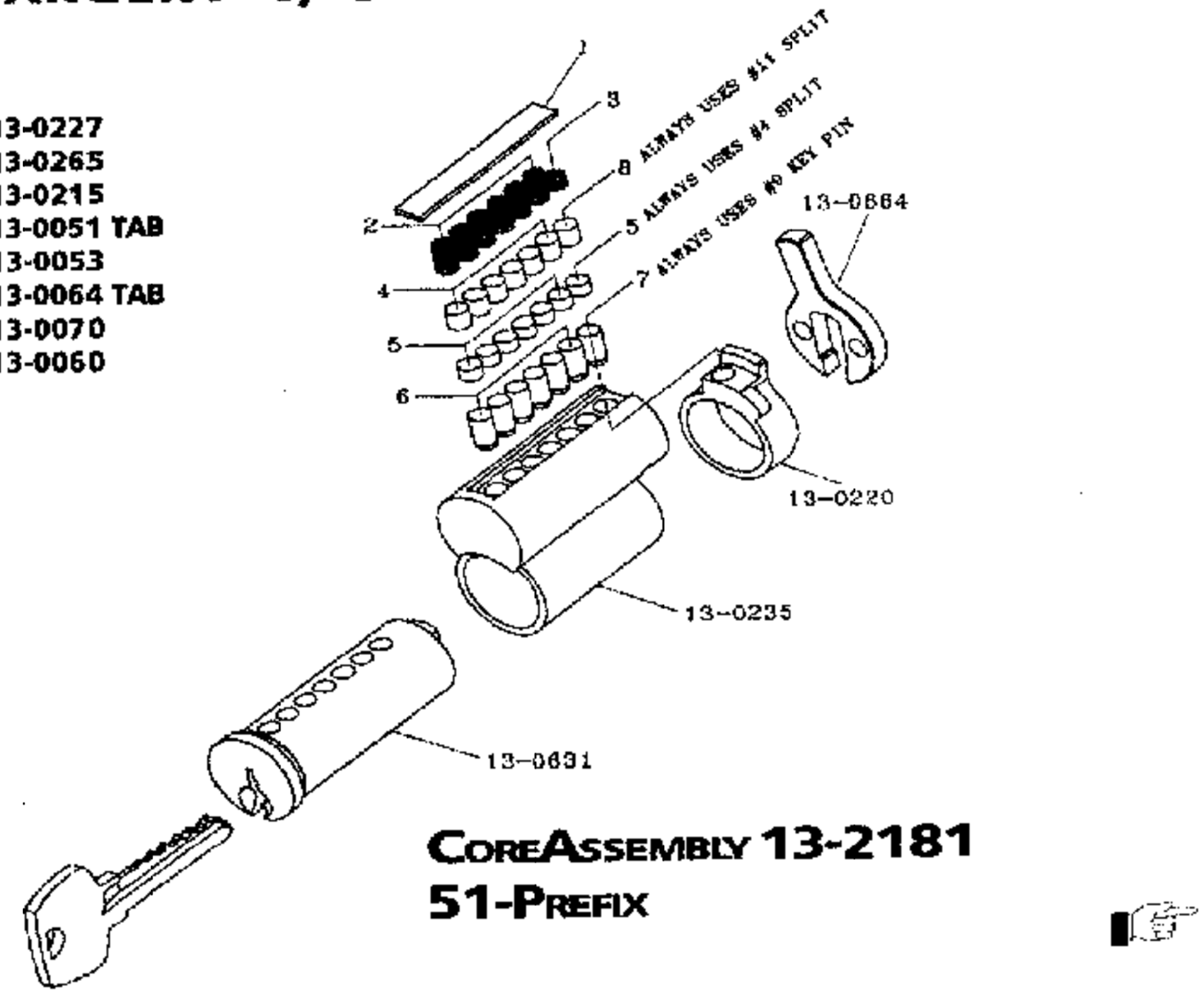
A word of warning – NEVER retro-actively create a 6300 Control Key, for a UNICAN lock for example.
This is a certain recipe for disaster and is sure to impact on another area of the chart at some point.



Sargent 6300 Removable Core

Sargent I/C Core 5100 Series

1	Slide	13-0227
2	Springs (6)	13-0265
3	Spring (1)	13-0215
4	Drivers	13-0051 TAB
5	Split (1)	13-0053
6	Key Pin(6)	13-0064 TAB
7	Key Pin	13-0070
8	Driver(1)	13-0060



CoreAssembly 13-2181

51-Prefix