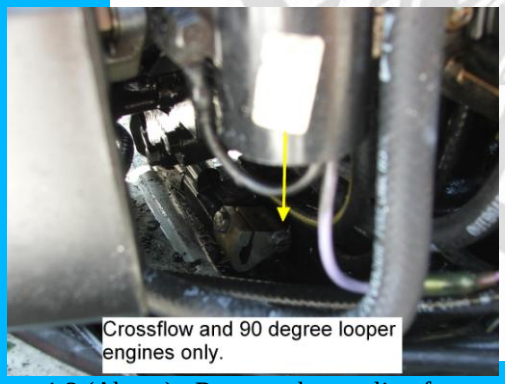
Gearcase Installation Instructions

SE300 Series

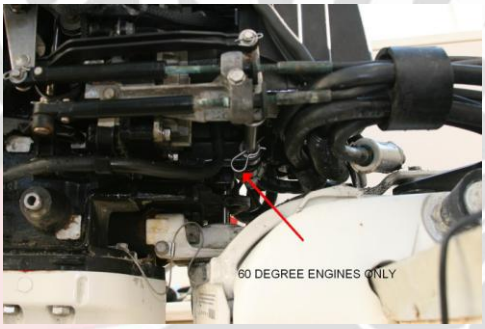
Step 1

Removing your old gearcase

1.1 (Above) Remove the cotter pin for the prop nut. Slide off the castle nut cover. Block the propeller with a piece of wood to keep it from spinning while you loosen and remove the prop nut. Remove the propeller and thrust washer. The thrust washer may stick in the propeller.

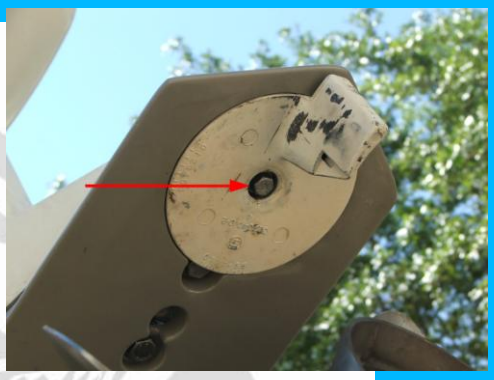


1.2 (Above) Remove the cowling from the engine. If your engine is a crossflow or 90 degree looper, remove the bolt that secures the shift rod to the shift linkage (yellow arrow). It is located below the carburetors. On some models, it is much easy to access the bolt if you remove the lower cowlings. If your engine is a 60 deg (non E-TEC) the procedure is different, see below.

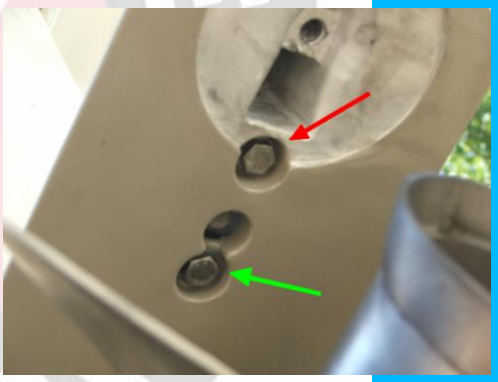


1.3 (Above) The shift shaft is attached to the shift linkage differently on 60 deg engines. Remove the lower cowlings. Pull the retaining clip (arrow) out and push the entire shift linkage assembly towards the center of the engine. Slide the shift shaft off of the pin.

1.4 (Above) Some models use a pitot pickup in the lower unit for the speedometer. If your unit is so equipped, disconnect the tube before removing the unit. The unit pictured does not utilize the pick-up. The arrow points to the nipple where it would be hooked up.



1.5 (Above) Remove the trim tab bolt with a 7/16” socket (red arrow). Note the angle of the tab so that you can duplicate it on the SE306 unit.



1.6 (Above) Once the trim tab is out of the way you can gain access to the rear mounting bolt (red arrow) . Using a 1/2” socket remove the bolt. Using a 9/16” socket, remove the other rear mounting bolt (green arrow).

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1.7 (Above) Using a 9/16 socket, remove the four mounting bolts (red arrows). There are two on each side. These are the last bolts holding the gearcase to the midsection. The unit will be able to drop when they are removed, so be prepared.

STEP 2

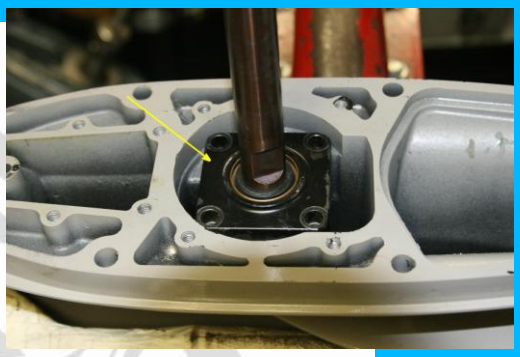
Preparing the 304/305/306

The SEI 300 series units do not come ready to be installed. The SEI unit is sold without an upper driveshaft. This allows the unit to fit many different models. Since there is no upper driveshaft, a water pump kit is not provided with the unit; one is available separately. Also, the shift shaft from your original unit will need to be transferred to the SEI unit.

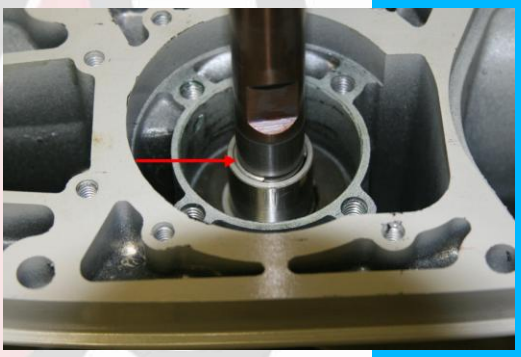
2.1 You will need to remove the upper driveshaft from your old unit. All OMC lower units produced after 1989 have two piece drive shafts. The connection is made inside the unit, so they may appear to have a one piece driveshaft. The upper shaft is secured to the lower shaft with a roll pin. You will need to dissemble your unit to drive the pin out and separate the halves. Units produced from 1989 through 1992 use an upper shaft that is incompatible with the SEI units. If you are replacing a unit from this timeframe or older, you will need to purchase a 1993 and newer style upper driveshaft. See the following picture to distinguish the two types of upper drive shafts if you are unsure of what year model you have.

The picture above shows the 1989 through 1992 and 1993 and newer upper driveshafts. The lower drive shaft (D), clip (A), and roll pin (B) are also shown.

1997 and newer 115hp units which use the 305 style gearcase have a different style driveshaft retention system. The upper driveshaft is held in by two wire clips. The old unit will not have to be fully disassembled to extract it. Remove the water pump assembly. Then, remove the four bolts holding down the driveshaft bearing carrier (see pic below). Remove the driveshaft bearing carrier (yellow arrow).



Once it is removed, you will see the upper wire clip (see pic below, red arrow). Use a flat blade screwdriver and slide it off.



Forcefully push the upper driveshaft down into the lower driveshaft. Then pull back up. The driveshaft should slide out. The lower clip will be stuck on the end of the upper driveshaft. Use the screwdriver and remove it. Discard the two wire clips. They will not be reused in the SEI unit.

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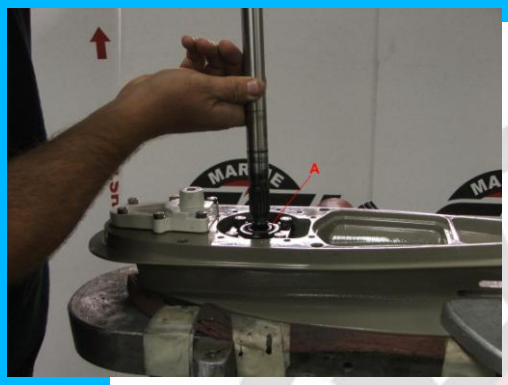
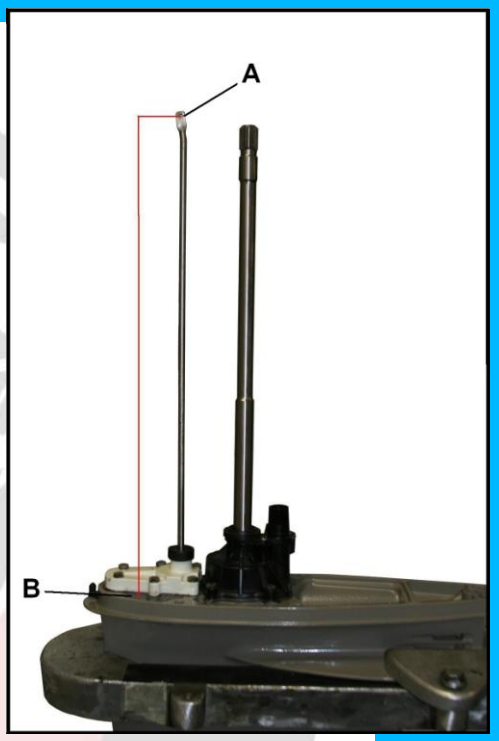


2.2 (Above) Installation of the upper drive shaft into the SEI gearcase is very simple and straight forward. Simply slide the upper driveshaft past the seals in the upper driveshaft carrier (A) and align the splines with the lower shaft. The upper shaft will drop down until it contacts the retaining clip in the lower drive shaft. Softly hit the end of the upper drive shaft with a mallet or block of wood until you feel it engage the teeth of the clip. You will know that the shaft is installed properly when you can no longer pull the upper drive shaft back out.

2.3 (Above) Remove the shift shaft from your old gearcase. It simply unscrews and slides out. Apply some grease to the threads to ease installation. There is an o'ring in the hole of the shift shaft cover (A). Thread the shift shaft through the o'ring so that it is not damaged. Some 25 and 30 inch models use a plastic spacer (not shown) which sits on top of the shift cover housing and spaces out a grommet that seals against the mid-section. If your old unit uses the spacer, slide it on the shift shaft before threading the shift shaft into the gearcase. Once the threads are past the o'ring, the shaft will drop down approximately 12 inches and contact the lower detent shifter into which it threads. Thread the shift shaft into the detent shifter about eight turns. As the shift shaft is threaded in or out, the height of the shaft changes. The height of the shift shaft is critical and specific to your model type. To set this height, the gearcase must first be shifted into neutral. Pulling up on the shift shaft puts the gearcase into forward gear. Pushing down on the shift shaft puts the gearcase into reverse. The detent or notch that you feel between forward and reverse is the neutral position.



2.4 (Above) Determine the correct shift shaft height for your specific model in a service manual or call SEI for help. The measurement is from the centerline of the hole at the top of the shaft (A) to the mounting surface of the gearcase (B). Thread the shift shaft in or out until the measurement is reached. The bend at the top of the shift shaft will face the front of the gearcase.

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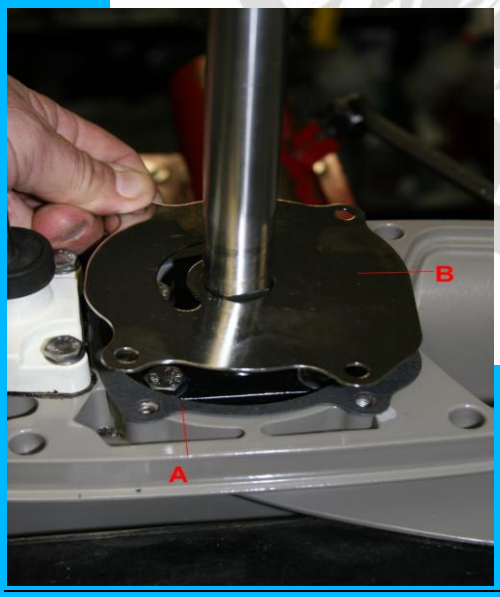
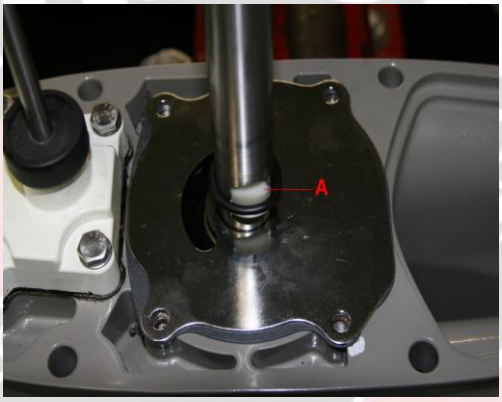
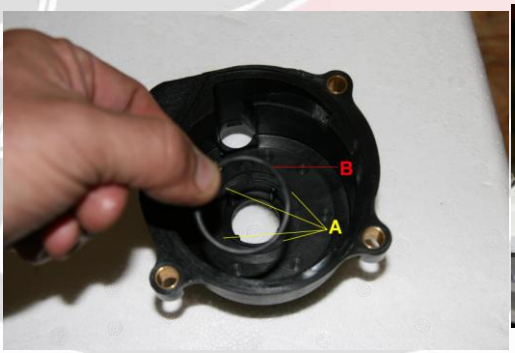
2.5 (Above) As stated earlier, the SEI unit does not come with a water pump. You may transfer your existing pump from your old gearcase. If you chose this route, just reverse the removal process to install the pump onto the SEI gearcase. You may want to use a new base gasket and housing o'ring. If you purchased a new water pump, it will have to be assembled before it is ready to be installed onto the SEI unit. Water pump kits, such as the SEI kit, usually come with more parts than your model needs because they are designed to fit many different models. The picture above shows all the parts which come in a SEI water pump kit.



2.6 (Above) Apply aviation gasket sealant to both sides of the base gasket (A) and place it on the gearcase, aligning the holes in the gasket with the bolt holes in the gearcase. Place the wear plate (B) on top of the gasket and align the bolt holes.

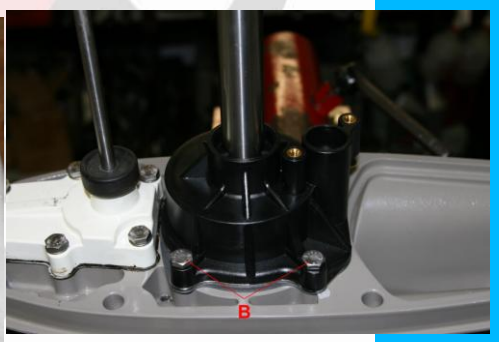


2.7 (Above) Place the wedge (A) in the slot of the driveshaft. Use the o'ring from the kit to hold the key against the shaft. Make sure the wedge is positioned as pictured.



2.8 (Above) An o'ring must be installed in a groove in the plastic housing before the liner can be installed. Place a small dab of adhesive in the areas marked (A). Place the o'ring (B) in the slot.

2.9 (Above) Smear aviation gasket sealant around the outside of the liner. Insert the liner (A) into the plastic housing and seat it fully against the o'ring. The impeller has a top and a bottom. The bottom has a groove (D) where the hole for the driveshaft is located. Smear a small amount of grease inside the liner and install the impeller (B) by using a twisting motion. Make sure that the fins of the impeller are oriented as shown in the picture. Apply adhesive to the large groove around the liner and install the similar sized o'ring (C) into the groove.



2.10 (Above) Slide the water pump housing as assembled down the driveshaft. Align the wedge held with the o'ring with the corresponding slot in the impeller and slide the housing down until it contacts the wear plate. The impeller will push the o'ring off of the key and the o'ring will settle into the groove at the bottom of the impeller.

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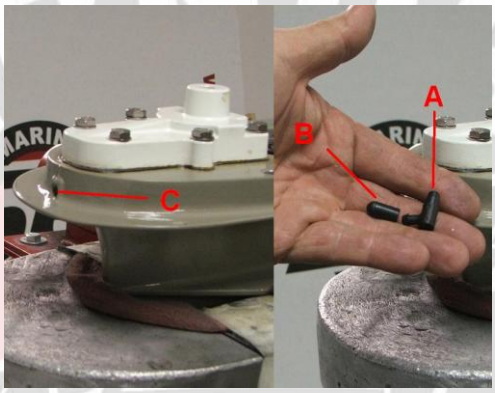
Using a 7/16” socket, install the four provided screws (A) and tighten evenly to 60 to 84 in. lbs.

2.11 (Above) Insert the grommet (A) into the water outlet (B) of the housing. Install the grommet with the inside taper facing up.

2.12 (Above) Slide the housing cover (A) down the driveshaft and align it with the housing. Secure the cover to the housing with the two screws (B) and tighten them to 24 to 36 in. lbs. Apply some adhesive to the bottom of the grommet (C) and stretch it around the top of the cover. Some 25 and 30 inch models use one of the extension tubes and grommet with the flared end. Compare to your old unit to see if this applies to you. The water pump also has a grommet for the shift shaft (D).

Slide it over the shaft and position as shown. Again, some 25 and 30 in models use a plastic spacer (not shown) which goes between the shift cover housing and the grommet.



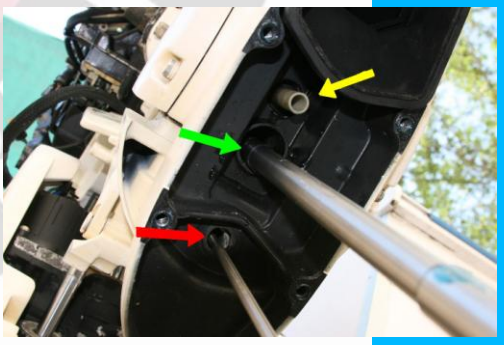
2.13 (Above) Some OMC models had a pitot for the speedometer built into the case. The SEI 305 and 306 have this feature. The elbow (A) and cover (B) are packaged in a small plastic bag with the unit for shipping and need to be installed when you are ready to mount the gearcase. Simply drive the nipple into the hole (C) with the barb facing up. Place the cap over the end of the nipple if you choose not to use the pitot.

STEP 3

INSTALLING THE GEARCASE

The SEI unit is now ready to be installed onto the engine. Take the time to clean the mounting bolts and remove any corrosion from the mid-section mounting threads. Apply marine grade grease to all the bolts. Also apply grease to the driveshaft splines. Do not get any grease on top of the driveshaft.

3.1 (Above) Most units will have a lower exhaust extension (arrow). It may stay stuck in the midsection when the lower unit was removed. Remove it and inspect the seals on both ends. Replace as necessary. Before installing the SEI gearcase, push the extension piece back into place. The upper seal should hold it in place. Slide the propeller onto the propshaft. Do not install the nut at this time.



3.2 (Above) Push the shift shaft on the gearcase down, which puts it into reverse. If you turn the propeller, the driveshaft will now turn also. Insert the ends of the shift shaft (red arrow) and driveshaft (green arrow) into their corresponding holes and lift the gearcase into place. The yellow arrow

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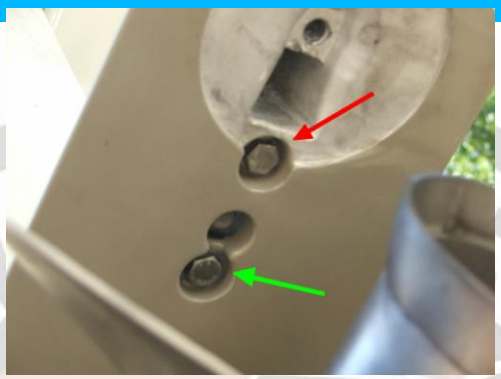
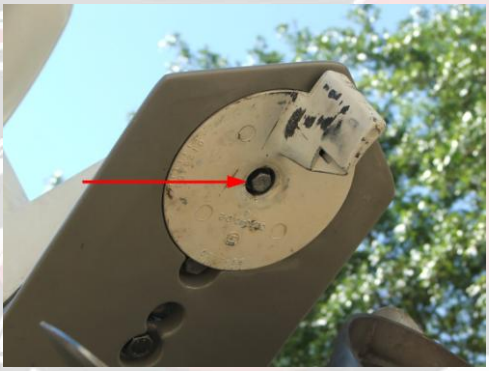
points to the water tube which you will align with the outlet of the gearcase's water pump.

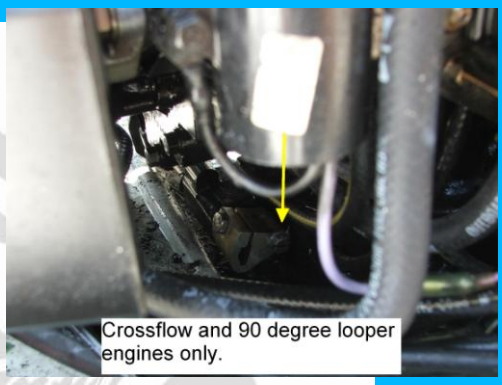
3.3 (Above) Lift the gearcase towards the midsection as high as it will go. The likelihood of the driveshaft splines being aligned with the end of the crankshaft is very low. If they are not aligned, you will not be able to raise the gearcase all the way to the mating surface of the midsection. To align the splines, turn the propeller, which turns the driveshaft. When the splines align, the gearcase will slide closer to the midsection, but may not make contact with it. Look into the gap and verify that the water tube has aligned with the water pump's outlet. Thread the four mounting bolts (arrows) and partially tighten them. Insure that the lower seal of the exhaust extension is properly seated into the recess of the gearcase. Use a flat blade screw driver to push it into place. Evenly tighten the four mounting bolts to 22-24ft.-lb on 304 and 305 gearcases, and 26-28ft.-lb on 306 gearcases.



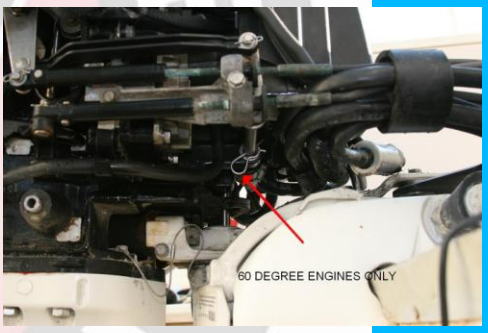
3.4 (Above) Install the 3/8" bolt (red arrow) and tighten to 22-24ft.-lb on 304 and 305 gearcases, and 26-28ft.-lb on 306 gear cases. Install the 7/16" bolt (green arrow) and tighten to 30-32 ft.lb for 304 and 305 gearcases, and 45-50ft.lb on 306 gearcases.



3.5 (Above) Re-install the trim tab. Tighten the mounting bolt to 35-40ft.lb.



3.6 (Above) On 90 degree looper and crossflow engines align the shift shaft with the shift linkage and re-install the retaining bolt.



3.7 (Above) The shift shaft on 60 degree engines attaches differently. Push the entire shift linkage assembly towards the center of the engine. Align the hole in the shift shaft with the pin on the linkage. Pull the linkage towards the outside of the engine, and reinstall the retaining pin.

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3.8 (Above) Remove the propeller. Apply water proof marine grease liberally to the propshaft splines. Slide the propshaft thrust washer on and seat it on the taper of the shaft. Install the propeller followed by the rear splined washer. Thread the prop nut onto the end of the propshaft. On units which use a brass splined rear washer, torque the nut to 60-70ft.-lbs. On units which use a plastic splined rear washer, torque the nut to 120 in.-lbs. Install cotter pin. If the cotter pin hole will not line up, tighten the nut slightly until it does. Do not loosen the nut.

3.9 (Above) Remove the anode from your old lower unit if you are planning on reusing it. Hold the anode (red arrow) in the mounting space and thread the bolt though the case and into the anode. 304 and 306 units use a 5/16" bolt with ½" hex head, which passes through the anode and threads into the gearcase. 305 units use a 3/8" bolt with a 9/16" hex head, which threads into the anode.

3.10 (Above) Remove the drain and fill plugs (arrows). Thread a gear lube pump into the threads of the drain plug lower plug). Pump gear lube slowly into the gearcase until it comes out of the vent plug (upper plug). Re-install the vent plug, then quickly remove the pump and re-install the drain plug.

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Tools Needed:

Sockets

- 7/16” Socket
- 1/2” Socket
- 9/16” Socket
- 5/8” Socket
- 1-1/16” Socket

Misc.

- Ratchet
- Pliers
- Tape measure
- Flat head screwdriver
- Torque wrench
- Gear lube pump

Wrenches

- 9/16” Wrench

Sealers / Lubricants

- Grease
- Aviation gasket adhesive
- 90 wt. marine grade gear lube

Disclaimer

While every precaution has been taken in the preparation of these guides, SEI assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from use of the information contained herein. Publication of the procedures in these guides does not imply approval of the manufacturers of the products covered. Persons engaging in the procedures herein do so at their own risk.

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