<table>
<thead>
<tr>
<th>Steering Type</th>
<th>Vessel Size/Type and Overall Use</th>
<th>Recommended Core Pack</th>
<th>Drive Unit Type</th>
<th>Components Included in Core Pack</th>
<th>Required Components not Included in Core Pack</th>
</tr>
</thead>
</table>
| Hydraulic     | Cruising applications only; for single engine outboard (150hp and below) vessels less than 25’ long. Up to 150 cc | Compact Reactor 40 Hydraulic Autopilot | 1.0L Pump | Reactor 40 Class B Compact Linear Actuator | - 3 or 5 O-Ring Male to 1/4” NPT female adapters  
- Hydraulic hose - machine-crimped or field replaceable fittings. Minimum 1000psi  
- Hydraulic T-connectors - varies by vessel  
- Hydraulic Shut-off valves - varies by vessel |
| Hydraulic     | Cruising applications only; for single engine outboard (150hp and below) vessels less than 25’ long. Up to 150 cc | Compact Reactor 40 Hydraulic Autopilot with GHC 20 Pack | 1.0L Pump | Reactor 40 Compact ECU HC 20  
GHC 20 | - 3 or 5 O-Ring Male to 1/4” NPT female adapters  
- Hydraulic hose - machine-crimped or field replaceable fittings. Minimum 1000psi  
- Hydraulic T-connectors - varies by vessel  
- Hydraulic Shut-off valves - varies by vessel |
| Hydraulic     | Cruising applications only; for single engine outboard (150hp and below) vessels less than 25’ long. Up to 150 cc | Compact Reactor 40 with Pump, GHC 20 and Shadow Drive Technology Pack | 1.0L Pump | Reactor 40 Compact ECU HC 20  
GHC 20 | - 3 or 5 O-Ring Male to 1/4” NPT female adapters  
- Hydraulic hose - machine-crimped or field replaceable fittings. Minimum 1000psi  
- Hydraulic T-connectors - varies by vessel  
- Hydraulic Shut-off valves - varies by vessel |
| Hydraulic     | Single-cylinder applications. Up to 200 cc | Reactor 40 Hydraulic Autopilot | GHP 1.2L Pump | Reactor 40 Class A Linear Actuator  
ECU 12 | - 3 or 5 O-Ring Male to 1/4” NPT female adapters  
- Hydraulic hose - machine-crimped or field replaceable fittings. Minimum 1000psi  
- Hydraulic T-connectors - varies by vessel  
- Hydraulic Shut-off valves - varies by vessel |
| Hydraulic     | Dual-cylinder applications. 200 - 300 cc | Reactor 40 Hydraulic Autopilot | GHP 2.0L Pump | Reactor 40 Class A Linear Actuator  
ECU 12 | - 3 or 5 O-Ring Male to 1/4” NPT female adapters  
- Hydraulic hose - machine-crimped or field replaceable fittings. Minimum 1000psi  
- Hydraulic T-connectors - varies by vessel  
- Hydraulic Shut-off valves - varies by vessel |
| Hydraulic     | Premium, recommended option for most hydraulic steering installations, including Verado®, power assist, and total cylinder volumes 100 - 370 cc. Recommended for high use, rougher waters, high performance, and slow speed applications. Also recommended for Evinrude G2 Dynamic Power Steering systems. | Reactor 40 Hydraulic Core Pack with SmartPump v2 | SmartPump v2 | Reactor 40 Compact ECU HC 20  
GHC 20 | - 3 or 5 O-Ring Male to 1/4” NPT female adapters  
- Hydraulic hose - machine-crimped or field replaceable fittings. Minimum 1000psi  
- Hydraulic T-connectors - varies by vessel  
- Hydraulic Shut-off valves - varies by vessel |
| Mechanical Steering | Total vessel displacements up to 28,500 pounds, with very low backdrive force required | Reactor 40 Mechanical/Solenoid Retrofit Core Pack | Class A Linear Actuator | Reactor 40 ECU 12  
HC 20 | 010-11572-00: Class A linear actuator; has rudder feedback included |
| Mechanical Steering | Total vessel displacements up to 48,400 pounds | Reactor 40 Mechanical/Solenoid Retrofit Core Pack | Class B Compact Linear Actuator | Reactor 40 ECU 12  
HC 20 | 010-12029-00: Class B linear actuator; has rudder feedback included |
| Mechanical Steering | Total vessel displacements from 48,000 to 79,000 pounds | Reactor 40 Mechanical/Solenoid Retrofit Core Pack | Class B Linear Actuator | Reactor 40 ECU 12  
HC 20 | 010-11573-00: Class B linear actuator; has rudder feedback included |
| Mechanical Steering | Sailboats with non-Garmin drive units | Reactor 40 Mechanical/Solenoid Retrofit Core Pack | Third-party Drive Unit | Reactor 40 ECU 12  
HC 20 | 010-11533-00: Actuator Motor Cable, 010-11829-00: GP 10 Rudder sensor; or 010-11532-00 + third party rudder sensor. |
| Steer by Wire | SeaStar Optimus, ZF Pod Drive, Yaama, Evinrude G2 Intelligent Piloting System (including iDock) | Reactor 40 Steer-by-wire Standard Core Pack | Class B Linear Actuator | Reactor 40 GHP 2.0L Pump | 010-11533-10: Solenoid Cable  
010-11829-00: GP 10 rudder sensor or 010-11532-00 + third party rudder sensor. |
| Steer by Wire | Yamaha Helm Master | Reactor 40 Steer-by-wire Core Pack for Yamaha Helm Master | Gateway Included | Reactor 40 ECU 12  
HC 20 | 010-11532-00 + third party rudder sensor |
| Steer by Wire | Volvo IPS or Sterndrive (C3 or newer Volvo EVC Systems) Aquamatic Sterndrive DPI | Reactor 40 Steer-by-wire Core Pack for Volvo Penta | Gateway Included | Reactor 40 ECU 12  
HC 20 | 010-11533-10: Solenoid Cable  
010-11829-00: GP 10 rudder sensor or 010-11532-00 + third party rudder sensor. |
| Steer by Wire | Viking VIPER | Reactor 40 Steer-by-wire Core Pack for Viking VIPER | Third-party Solenoid Required | Reactor 40 ECU 12  
HC 20 | 010-11533-10: Solenoid cable  
010-11829-00: GP 10 rudder sensor or 010-11532-00 + third party rudder sensor. |
| Solenoid | Constant running hydraulic pump systems with solenoid autopilot control | Reactor 40 Mechanical/Solenoid Retrofit Core Pack | Third-party Solenoid Required | Reactor 40 ECU 12  
HC 20 | 010-11533-10: Solenoid cable  
010-11829-00: GP 10 rudder sensor or 010-11532-00 + third party rudder sensor. |
| Cable Steer | Most cable steered vessels | Reactor 40 Mechanical/Solenoid Retrofit Core Pack | Third-party 12VDC Brushed Motor Actuator Required | Reactor 40 ECU 12  
HC 20 | 010-11533-10: Solenoid cable  
010-11829-00: GP 10 rudder sensor or 010-11532-00 + third party rudder sensor. |
| Auxiliary Gas Engine (Kicker) | Up to 25HP auxiliary gas engines from most major manufacturers | Reactor 40 Kicker | | | |

The Wireless Remote with gesture control is an optional accessory compatible with all Garmin autopilots listed; requires GHC20 or supported chartplotters.
### Recommended Pump Size for the GHP Hydraulic Autopilots

Garmin offers a number of different size pumps for our marine autopilot systems. The boat’s configuration will determine which pump is best suited for the application.

<table>
<thead>
<tr>
<th>Pump Model</th>
<th>Cylinder Type</th>
<th>Vessel Size/Type and Overall Use</th>
<th>Maximum Cylinder</th>
<th>Pump Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0L Pump</td>
<td>Single-cylinder applications</td>
<td>Cruising applications only; for single engine outboard (150hp and below) vessels less than 25' long. Not recommended for fishing or applications that require holding heading while trolling at low speeds or operating in rough waters. For applications that require precise heading control, our higher-performance Reactor 40 models are recommended. Compact Reactor uses a gear pump design with limited performance relative to similar flow piston pumps. Not recommended for power assist installs, engines above 150 horsepower, or boats with more than 12 degree deadrise. Mount pump within 6 feet of the steering cylinder for best results.</td>
<td>Up to 150 cc</td>
<td>Gear Pump</td>
</tr>
<tr>
<td>GHP 1.2L Pump</td>
<td>Single-cylinder applications</td>
<td>A low-cost option for single-cylinder applications.</td>
<td>Up to 200 cc</td>
<td>High Pressure / Low Volume pump (HPLV)</td>
</tr>
<tr>
<td>GHP 2.0L Pump</td>
<td>Dual-cylinder applications</td>
<td>A low-cost option for dual-cylinder applications.</td>
<td>200 - 300 cc</td>
<td>Low Pressure / High Volume pump (LPHV)</td>
</tr>
<tr>
<td>SmartPump v2</td>
<td>Single or multiple cylinder applications</td>
<td>Premium, recommended option for most hydraulic steering installations, including Verado® power assist. Recommended for high use, rough waters, high performance, and slow speed applications. Also recommended for Evinrude G2 Dynamic Power Steering systems.</td>
<td>100 - 370 cc</td>
<td>Adaptable pressure and volume pump</td>
</tr>
</tbody>
</table>
The outboard motors listed below are compatible only if:

- **The outboard has a tiller handle.** Outboards without a tiller handle may work with custom installation not supported by Garmin.
- **The outboard has a tilt tube.** Outboards without a standard tilt tube are not compatible. Aftermarket “bolt-on” tilt tubes are not supported (incorrectly positions steering actuator).

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Motor HP</th>
<th>Year</th>
<th>Required Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yamaha</td>
<td>EFI 20, 25</td>
<td>19-newer</td>
<td>Yamaha EFI linkage parts (010-12826-05), Sold separately. If factory tilt tube is too short, must replace with Tilt Tube (010-12826-03)</td>
</tr>
<tr>
<td>Yamaha</td>
<td>Carbureted T8, T9.9, F9.9</td>
<td>08-newer</td>
<td>Bag #1 included with R40 Kicker¹</td>
</tr>
<tr>
<td>Yamaha</td>
<td>Carbureted 15, 20</td>
<td>07-newer</td>
<td>Bag #2 included with R40 Kicker¹</td>
</tr>
<tr>
<td>Honda</td>
<td>Carbureted 8, 9,9 Only motors with factory tilt tube</td>
<td>01-newer</td>
<td>Bag #5 included with R40 Kicker¹ Compatible only with outboards with a factory tilt tube.</td>
</tr>
<tr>
<td>Honda</td>
<td>Carbureted 15, 20</td>
<td>03-newer</td>
<td>Bag #5 included with R40 Kicker¹</td>
</tr>
<tr>
<td>Mercury</td>
<td>Carbureted 8, 9,9,9 Bigfoot &amp; Pro</td>
<td>06-newer</td>
<td>Bag #3 included with R40 Kicker</td>
</tr>
<tr>
<td>Mercury</td>
<td>EFI 15, 20</td>
<td>17-newer</td>
<td>Bag #4 included with R40 Kicker</td>
</tr>
<tr>
<td>Suzuki</td>
<td>EFI 9.9, 15, 20</td>
<td>14-newer</td>
<td>Suzuki Linkage Parts (010-12826-04), Sold separately</td>
</tr>
<tr>
<td>Tohatsu</td>
<td>Carbureted 8hp (MFS08A and up), Carbureted 9.8 (MFS9.8A and up)</td>
<td>Not Compatible</td>
<td>These outboards are not supported. They do not have tilt tubes.</td>
</tr>
<tr>
<td>Tohatsu</td>
<td>Carbureted 9.9 (MFS9.9C and up)</td>
<td>08-newer</td>
<td>Bag #3 included with R40 Kicker¹ Compatible only with outboards with a factory tilt tube.</td>
</tr>
<tr>
<td>Tohatsu</td>
<td>EFI 9.9, 15, 20, 25</td>
<td>17-newer</td>
<td>Bag #4 included with R40 Kicker²</td>
</tr>
</tbody>
</table>

¹Consider replacing the mild steel tilt tubes supplied by Yamaha and Honda with our stainless steel tilt tube (see accessories on Garmin.com). Yamaha and Honda tilt tubes will be more susceptible to corrosion and require more frequent cleaning and lube, especially when used in saltwater. Reactor 40 Kicker is designed for freshwater and saltwater use.

²For the purposes of Reactor 40 Kicker installation, consider Mercury and Tohatsu outboards to be the same.