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August 21, 2024

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APPLICATION NUMBER: ***62/500,821***
FILING DATE: ***May 03, 2017***

UNITED STATES PATENT AND TRADEMARK OFFICE · DEPARTMENT OF COMMERCE

Certified by

Katherine Kelly Vidal

Performing the Functions and Duties of the
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	206897
	Application Number	
Title of Invention	HIGH RETENTION FORCE SERVICEABLE PLUG-ON CVJ	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Michael	Walter	Hopson	

Residence Information (Select One) ● US Residency Non US Residency Active US Military Service

City	State/Province	Country of Residence
Clinton Township	MI	US

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Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Arvind		Srinivasan	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

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Country	US

Inventor 3 Remove

Legal Name

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	Michael	Peter	Kinsella	

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American Axle v. Neapco - IPR2025-00090
PET_AAM_1003-0002

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City	White Lake	State/Province	MI	Country of Residence	US

Mailing Address of Inventor:

Address 1	605 Sunnybeach Drive		
Address 2			
City	White Lake	State/Province	MI
Postal Code	48386	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	43935		
Email Address	DMiller@slk-law.com	Add Email	Remove Email

Application Information:

Title of the Invention	HIGH RETENTION FORCE SERVICEABLE PLUG-ON CVJ		
Attorney Docket Number	206897	Small Entity Status Claimed	☐
Application Type	Provisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	1	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

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Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	◯ Limited Recognition (37 CFR 11.9)
Customer Number	43935		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

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Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	206897
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Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	206897
	Application Number	
Title of Invention	HIGH RETENTION FORCE SERVICEABLE PLUG-ON CVJ	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Applicant:

Address 1			
Address 2			
City		**State/Province**	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	206897
	Application Number	
Title of Invention	HIGH RETENTION FORCE SERVICEABLE PLUG-ON CVJ	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

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Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/James D. Miller/			Date (YYYY-MM-DD)	2017-05-03
First Name	James D.	Last Name	Miller	Registration Number	46932

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	206897
	Application Number	
Title of Invention	HIGH RETENTION FORCE SERVICEABLE PLUG-ON CVJ	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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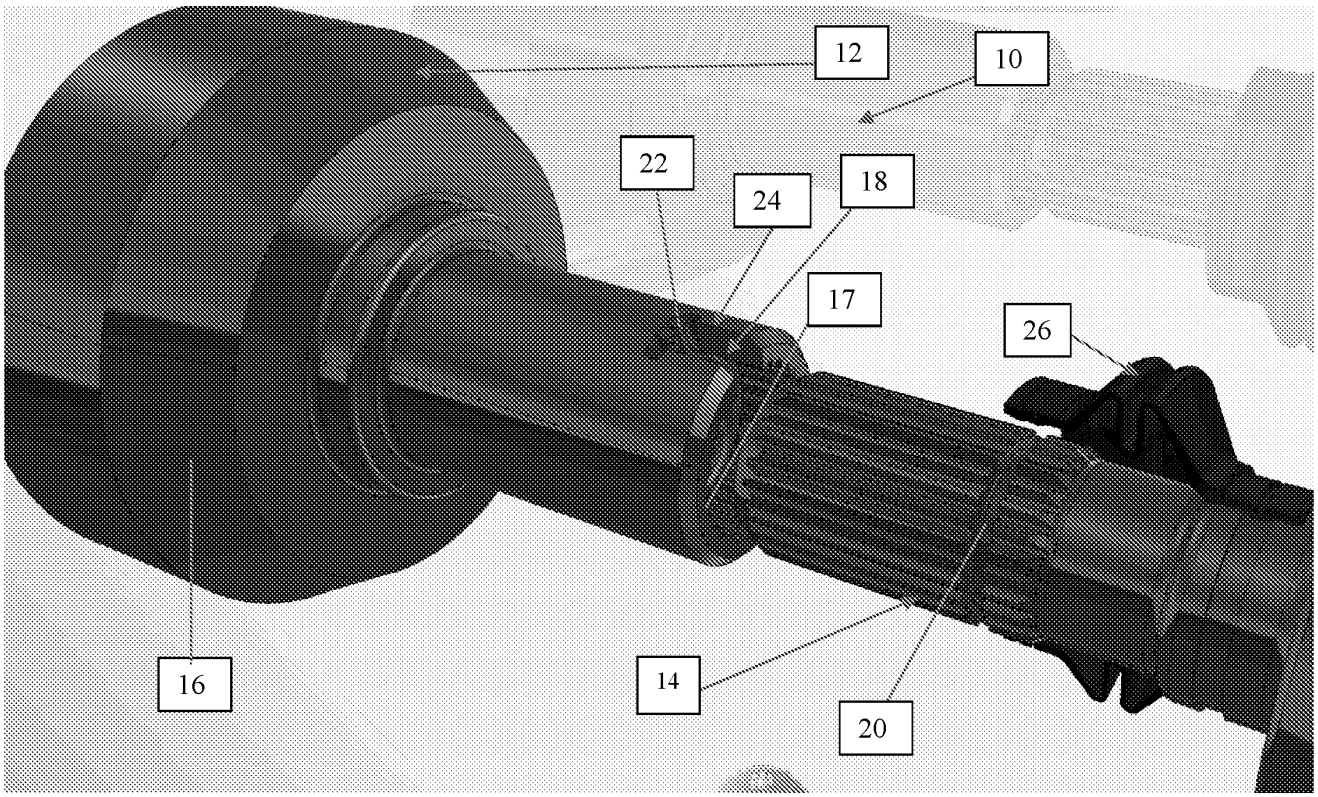

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HIGH RETENTION FORCE SERVICEABLE PLUG-ON CVJ

FIELD

[0001] The present invention relates to joint assemblies and more particularly to a propeller shaft constant velocity joint with plug-on interface.

BACKGROUND OF THE INVENTION

[0002] Joint assemblies such as constant velocity joints are common components in automotive vehicles for applications requiring a transmission of torque through an angle with a constant velocity motion. Constant velocity joints (CV joints) are typically used to transmit torque at an angle from a powertrain transmission (transmission or four wheel drive system, for example) of a vehicle to final drive components with a constant velocity or speed.

[0003] One type of CV joints are referred to as plug-on CV joints. Plug-on CV joints are used for attachment of a propeller shaft of the vehicle to the powertrain or to the final drive components without requiring the use of threaded fasteners or bolts to secure the joints. Typically, the plug-on CV joint includes an outer joint member and an inner joint member. Internal splines formed on either the inner joint member or the outer joint member couple with external splines formed on the powertrain or a final drive component shaft and secured with an expanding snap ring. The snap ring secures or locks the CV joint axially when corresponding grooves of the internal splines and the external splines are aligned.

[0004] Generally, the plug-on CV joints are used for vehicles such as passenger cars and light truck applications having independent suspensions, wherein the drivelines are not subjected to high cyclic axial thrust loading incurred from rapid movement of live beam axles. Disadvantageously, the snap rings used to axially retain or lock the CV joint to the powertrain or final drive components are entirely covered and not easily accessible after assembly. As a result, the snap ring is not easily accessible for disassembly or disengagement with tools during maintenance. To overcome this disadvantage, the snap ring and corresponding grooves are configured to permit forced disassembly with pry tools employing relatively minimal axial loads, generally less than about 500 pounds.

[0005] However, these plug-on CV joints with the snap ring are unable to withstand higher thrust loads applied to the driveline on live beam axle applications, while still permitting easy

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access to the snap ring for maintenance.

[0006] It would be desirable to provide a robust plug-on CV joint configured for maximized axial retention of the CV joint to a powertrain or final drive components while maximizing an ease of maintenance thereof.

SUMMARY OF THE INVENTION

[0007] In accordance and attuned with the present invention, robust plug-on CV joint configured for maximized axial retention of the CV joint to a powertrain or final drive components while maximizing an ease of maintenance thereof, has surprisingly been discovered.

[0008] According to an embodiment of the disclosure, a joint and shaft assembly is disclosed. The joint and shaft assembly includes a joint having splines formed thereon. A shaft includes splines formed thereon and is coupled to the joint. The splines of the shaft engage the splines of the joint. An access window is formed on the joint. A ring retains the shaft to the joint. A portion of the ring is accessible through the access window.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The above advantages of the invention will become readily apparent to those skilled in the art from reading the following detailed description of an embodiment of the invention in the light of the accompanying drawing which is a top perspective view of a portion of a joint and shaft assembly according to an embodiment of the disclosure.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0010] The following detailed description and appended drawings describe and illustrate various exemplary embodiments of the invention. The description and drawings serve to enable one skilled in the art to make and use the invention, and are not intended to limit the scope of the invention in any manner. In respect of the methods disclosed, the steps presented are exemplary in nature, and thus, the order of the steps is not necessary or critical.

[0011] The present technology relates to joint and shaft assemblies, such as constant velocity joints and shafts, used in vehicles. However, the present disclosure can apply to other types of joint and shaft assemblies used in vehicles or in other applications. Joint and shaft assemblies according to the disclosure are configured to facilitate a transmission of rotational forces and torque between components of a vehicle.

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[0012] FIG. 1 shows a joint and shaft assembly 10 according to an embodiment of the present disclosure. The joint and shaft assembly 10 includes a joint 12 coupled to a shaft 14. The joint 12 includes an inner joint member (not shown) and an outer joint member 16. The joint 12 is configured as a snap-on constant velocity joint. The joint 12 can be a tri-pod type or ball-type constant velocity joint. However, it is understood that the joint 12 can be configured as any constant velocity joint or joint assembly of any type having an inner joint member and an outer joint member, as desired. Examples of various types of joints can be found in U.S. Pat. No. 6,739,422, U.S. Pat. No. 6,251,019, U.S. Pat. No. 7,922,590, and U.S. Pat. No. 8,231,475, the disclosures of which are hereby incorporated in reference in their entirety. The shaft 14 can be configured as transfer case, transmission output shaft, or axle pinion shaft. The shaft 14 can be configured for use with halfshaft inboard joints or wheel end or outboard joints or any other joints as desired. Although, it is understood the shaft 14 of the invention can be employed with any vehicle shaft as desired configured for coupling to the joint 12 and for transmitting torque from one component to another component.

[0013] The outer joint member 16 is configured to be splined with the shaft 14 of the vehicle. However, it is understood the inner joint member can be configured to be splined with the shaft 14 of the vehicle, if desired. A central bore 17 includes internal splines and receives the shaft 14 which has external splines configured to engage and receive the internal splines of the outer joint member 16.

[0014] A retaining ring 18 is employed to axially retain or lock the joint 12 to the shaft 14 when the splines of the joint 12 engage the splines of the shaft 14. The retaining ring 18 is configured as a non-continuous and annular expandable snap ring, wherein open ends of the ring 18 bias towards each other to permit expansion of the ring 18 when receiving the shaft 14 and contraction of the ring 18 when received in an annular groove 20 formed on the shaft 14. The ring 18 includes radially outwardly extending tabs 22 formed at the open ends thereof.

[0015] A window 24 is formed in an outer surface of the joint 12, such as in a cylindrical portion of the joint 12, for receiving the tabs 22 of the ring 18 therethrough. The window 24 is substantially "T" shaped, wherein a first portion of the window 24 is recessed from an end of the cylindrical portion and a second portion of the window 24 extends laterally from the first portion along a circumference of the cylindrical portion. The first portion has a width less than a width of the second portion. The tabs 22 extend outwardly from the joint 12 to permit a user to easily expand the ring 18 to disassemble the shaft 14 from the joint 12.

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[0016] The joint and shaft assembly 10 further includes a boot 26 configured for sealing at least a portion the shaft 14 and the joint 12 such as at the interface of the shaft 14 and the joint 12. A seal (not shown) such as an O-ring type seal can also be used in addition to the boot 26 to facilitate sealing between the components. The seal can be positioned internally of the joint 12 adjacent the ring 18 or can be placed externally on the joint 12. In other embodiments, the seal can be positioned on the shaft 14. More than one seal can be employed, if desired.

[0017] To assemble the joint and shaft assembly 10, the ring 18 is positioned within the central bore 17 of the joint 12 in a groove formed on the internal splines. To position the ring 18, the tabs 22 are slidingly received through the first portion of the window 24 until the tabs 22 are positioned within the second portion. The shaft 14 is received within the central bore 17, wherein the internal splines of the joint 12 engage the external splines formed on the shaft 14. As the shaft 14 is received in the central bore 17, the shaft 14 is consequently received through the ring 18. The ring 18 expands or is expanded as the shaft 14 passes therethrough until the ring 18 engages the groove 20 formed on the shaft 14. The second portion of the window 24 permits the tabs 22 of the ring 18 to expand as the shaft 14 passes therethrough. Once the ring 18 is positioned within the groove 20 of the shaft 14, the joint 12 is retained or locked to the shaft 14 to militate against an undesired axial displacement of the joint 12 with respect to shaft 14. The boot 26 is positioned to cover the interface of the joint 12 and shaft 14.

[0018] Advantageously, during maintenance of the joint and shaft assembly 10, the window 24 permits easy access to the ring 18, wherein a tool can be employed to effortlessly expand the ring 18 for ease of removal of the joint 12 from the shaft 14. The joint and shaft assembly 10 of the present disclosure facilitates at least 1,500 pounds of retention force to militate against unseating or disassembly of the components, such as the joint 12 and the shaft 14, in vehicles including live beam axle driveline applications. It is understood that other retention force amounts can be used as desired. The ring 18 configuration of the present disclosure is more robust than prior art configurations, while being easily accessible and ergonomically configured for maintenance purposes. The ring 18 can be thicker than rings known in the art or have sharp corners formed thereon for enhanced engagement to the groove 20 and to facilitate maximized retention force. Additionally, the groove 20 can have a depth greater than grooves 20 known in the art to facilitate maximized retention force. The ring 18 can have alternate cross-sectional shapes such as circular, square, rectangular, or elliptical, for

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example, or any other shape as desired, and the groove 20 can have a corresponding cross-sectional shape. Varying cross-sectional shapes and thicknesses of the ring 18 as well as the cross-sectional shape, sharpness of corners of, and depth of the groove 20 depends on the retention force required for the desired application.

[0019] In other embodiments, the joint 12 can include external splines formed on the inner joint member or the outer joint member 16 for engagement with internally formed splines on the shaft 14. Additionally, the ring 18 can be pre-installed on a groove formed on the internal splines of the joint 12. However, where the joint 12 includes external splines, the ring 18 may be preinstalled in a groove formed on the external splines of the joint 12. In another embodiment, the shaft 14 can include internally formed splines for receiving the ring 18 and the window 24 can be formed on the shaft 14. Furthermore, the ring 18 may require spreading the tabs 22 apart from each other to disassemble the shaft 14 from the joint 12, as shown, or the ring 18 may require a closing of the tabs 22 to disassemble the shaft 14 from the joint 12.

[0020] From the foregoing description, one ordinarily skilled in the art can easily ascertain the essential characteristics of this invention and, without departing from the spirit and scope thereof, can make various changes and modifications to the invention to adapt it to various usages and conditions.

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WHAT IS CLAIMED IS:

1. A joint and shaft assembly as shown and described in the specification and drawings provided herewith.

2. A joint and shaft assembly comprising:

a joint having a window formed therein and splines formed thereon;

a shaft having splines formed thereon and coupled to the joint, the splines of the shaft engaging the splines of the joint; and

a ring retaining the shaft to the joint, a portion of the ring accessible through the window of the joint.

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ABSTRACT

A joint and shaft assembly includes a joint having splines formed thereon. A shaft includes splines formed thereon and is coupled to the joint. The splines of the shaft engage the splines of the joint. An access window is formed on the joint. A ring retains the shaft to the joint. A portion of the ring is accessible through the access window.

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Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	HIGH RETENTION FORCE SERVICEABLE PLUG-ON CVJ
First Named Inventor/Applicant Name:	Michael Walter Hopson
Filer:	James D. Miller/Christine Golupski
Attorney Docket Number:	206897

Filed as Large Entity

Filing Fees for Provisional

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
PROVISIONAL APPLICATION FILING	1005	1	260	260
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**260**

Electronic Acknowledgement Receipt	
EFS ID:	29107884
Application Number:	62500821
International Application Number:	
Confirmation Number:	8108
Title of Invention:	HIGH RETENTION FORCE SERVICEABLE PLUG-ON CVJ
First Named Inventor/Applicant Name:	Michael Walter Hopson
Customer Number:	43935
Filer:	James D. Miller/Christine Golupski
Filer Authorized By:	James D. Miller
Attorney Docket Number:	206897
Receipt Date:	03-MAY-2017
Filing Date:	
Time Stamp:	16:39:06
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$260
RAM confirmation Number	050417INTEFSW00003471505605
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	206897_ADS_Filed_05032017.pdf	1791700 bec679478efbdef3812fc01cc95a455ac9beedfb	no	9
Warnings:					
Information:					
2	Drawings-other than black and white line drawings	206897_Drawing_Filed_05032017.pdf	442236 ef62b0b81d66599e19898f4c478f2ba4f9c2a1dc	no	1
Warnings:					
Information:					
3		206897_Application_Filed_05032017.pdf	97152 32b0a17b108a9190853f164f6575b9df8a3fbdb3	yes	7

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	5
Claims	6	6
Abstract	7	7

Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30286 9b013e524c67e795ae161e7c4846c7681bbc0579	no	2
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DocCode – SCORE

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Application Number: 62500821 Document Date: 05/03/2017

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
62/500,821	05/03/2017		260	206897		

CONFIRMATION NO. 8108

FILING RECEIPT

43935
Shumaker, Loop & Kendrick LLP
1000 Jackson Street
Toledo, OH 43804

OC000000091289094

Date Mailed: 05/11/2017

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

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Applicant(s)

Michael Walter Hopson, Clinton Township, MI;
Arvind Srinivasan, Troy, MI;
Michael Peter Kinsella, White Lake, MI;

Power of Attorney:
James Miller--46932

Permission to Access Application via Priority Document Exchange: Yes

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If Required, Foreign Filing License Granted: 05/10/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 62/500,821**

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No

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PET_AAM_1003-0025

Title

HIGH RETENTION FORCE SERVICEABLE PLUG-ON CVJ

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
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Application	Document	Mailroom Date	Attorney Docket No.
62500821	APP.FILE.REC	05/11/2017	206897

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