Swivel Joint

Operation & Maintenance Manual

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Proven Design | High-Pressure Flow Control | Field Reliability

Document No.	Version	Language
SM-SJ-MAN-001	2026 Edition	English / EN

Applicable standards: API Spec 6A / API Spec 16C / NACE MR0175

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WARNING: Before use, verify that the product model, pressure rating, connection type and field service conditions match the operating requirements.

CAUTION: Do not exceed rated pressure, disassemble under pressure, strike damaged connection components, or mix components with different pressure ratings.

CAUTION: Stop operation and isolate the product immediately if cracks, deformation, thread damage, seal failure, abnormal raceway wear, or unclear markings are found.

1. Application and Scope

Swivel joints are used in high-pressure flowlines to change line direction, compensate field installation offsets, and facilitate quick connection of high-pressure manifolds, fracturing lines, test lines, cementing/acidizing lines, and temporary flowlines. They are designed for high-pressure transfer under non-continuous rotation service and are not intended as rotating mechanical transmission components.

When selecting the product, confirm the bore size, pressure rating, connection type, swivel angle, service condition, and fluid medium. For H_2S or other sour service, select NACE-compliant products.

2. Construction and Working Principle

Swivel joints normally consist of elbow subs, straight subs, ball races, steel balls, seals, retaining rings, ball plugs, grease plugs, and hammer union end connections. Multiple ball races and sealing structures provide line direction adjustment and pressure containment.

• The pressure-containing body is made from an integral forging or high-strength material meeting design requirements. The pressure rating shall match the flowline system.

• Hammer union ends are used for quick field connection. Common connection types include F × M, M × M, and F × F.

• Ball races and steel balls provide load bearing and rotation. Keep them clean and regularly replenish specified grease during service.

• Seals are wear parts and shall be inspected or replaced according to the medium, temperature, pressure, and maintenance interval.

3. Model, Pressure Rating and Connection Type

Model designation is recommended as: nominal size + Fig rating + Style type + pressure rating + connection type + service condition. Example: 3" Fig 1502, Style 10, 105 MPa, F × M. Add NACE for sour service.

Item	Description
Style 10 / 20 / 30 / 50 / 80 / 100	**Indicates common swivel joint construction combinations and turning arrangements.**
Fig 602 / 1002 / 1502 / 2002	**Indicates the hammer union connection rating; it shall match field flowlines and adjacent equipment.**
F × M / M × M / F × F	**Indicates the end connection type; F denotes the female-threaded end; M denotes the spherical male end.**
NACE	**Indicates suitability for H_2S sour service; materials and seals**

	shall be confirmed against project requirements.

Common Swivel Joint Connection Types

4. Main Technical Parameters

The following values are typical supply ranges. Final dimensions, weight, materials, seals, and inspection requirements shall be governed by the purchase order, technical agreement, approved drawings, and valid product documents.

Item	Common Range
Nominal Size	**2", 3", and 4"; other sizes may be confirmed according to project requirements.**
Cold Working Pressure	**42 MPa, 70 MPa, 105 MPa, 140 MPa.**
End Connection	**Fig 602, Fig 1002, Fig 1502, Fig 2002 hammer union connections, etc.**
Style	**Style 10, 20, 30, 50, 80, 100, etc.**
Service Condition	**Standard service, NACE sour service.**
Applicable and Reference Standards	**SY/T 5211-2016; API Spec 6A; NACE MR0175.**

Representative Model Examples:

Representative Model	Size	Pressure	Connection Type	Service Condition
2" Fig 602, Style 10, 42 MPa, F × M	**2"**	**42 MPa**	**Fig 602 (F×M)**	**Standard**
3" Fig 1502, Style 10, 105 MPa, F × M	**3"**	**105 MPa**	**Fig 1502 (F×M)**	**Standard**
3" Fig 1502, Style 50, 70 MPa, F × M, NACE	**3"**	**70 MPa**	**Fig 1502 (F×M)**	**NACE**
3" Fig 2002, Style 80, 140 MPa, F × M	**3"**	**140 MPa**	**Fig 2002 (F×M)**	**Standard**

5. Pre-Installation Inspection

• Check nameplate, model, pressure rating, connection type and service condition, and confirm they match the flowline system.

• Check body, union threads, sealing faces, spherical faces, retaining rings, ball plugs and grease plugs. They shall be free from cracks, severe impact damage, deformation or obvious corrosion.

• Check wear parts such as seal rings, packing and grease retainers. Replace if aging, scratches, compression deformation or missing parts are found.

• Confirm that connection ends are clean and free from sand, iron chips, welding slag and hard foreign matter.

• Confirm good lubrication condition. After long-term storage, recheck grease and rust prevention condition.

6. Installation and Operation Requirements

• Confirm system depressurization before installation. Disassembly under pressure is strictly prohibited.

• Use unions with matching Fig rating and size. Do not mix different pressure ratings or incompatible connection types.

• Tighten the wing nut evenly. Abnormal hammering that may cause nut deformation, cracks or splash risk is strictly prohibited.

• Swivel joints shall not bear additional axial load, bending moment or external support load. Flowlines shall be properly supported.

• The product is only for direction adjustment and flowline connection. It shall not be installed on continuously rotating machinery.

• Raise pressure slowly. Check connections, ball plugs and sealing areas carefully during first pressurization and reuse after maintenance.

7. Maintenance

• Flush the bore promptly after operation to reduce corrosion and wear of body and sealing faces caused by residual mud, acid, fracturing fluid or sand-laden medium.

• Regularly replenish or replace applicable grease to avoid dry friction, corrosion or grease hardening in ball races.

• Regularly inspect seal rings, packing, grease retainers, steel balls and ball plugs. Replace with a same-specification repair kit if necessary.

• Regularly inspect body wall thickness and pressure-containing areas. Stop use if severe erosion, corrosion, cracks or wall thinning exceeds company rejection criteria.

• Protect exposed threads, sealing faces and stored parts against rust. Avoid impact damage to connection ends during transportation and storage.

8. Common Faults and Corrective Actions

Fault	Possible Cause	Corrective Action
Rotation Sticking or Unable to Rotate	**Hardened grease, foreign matter in ball race, damaged steel balls or incorrect ball quantity.**	**Disassemble, inspect and clean ball races; replenish grease as specified and replace steel balls and seals if**

		necessary.
Leakage at Ball Plug	**Aged packing, wrong installation direction or damaged sealing face.**	**Reinstall or replace packing, and check ball plug and sealing face.**
Leakage at Union Connection	**Damaged seal ring, worn spherical face, thread damage or insufficient make-up.**	**Replace seal ring, check spherical face and threads, and reconnect as specified.**
Tight Rotation or Abnormal Noise	**Insufficient lubrication, ball race wear or internal foreign matter.**	**Stop use, depressurize, disassemble and inspect; clean and replenish grease, and replace parts if wear is severe.**

9. Ordering and Technical Confirmation

When ordering swivel joints, provide at least the following information to confirm model, material, seals, inspection and delivery requirements:

• Nominal size, Fig rating, Style type, pressure rating and connection type.

• Service condition: standard service, low-temperature service, NACE sour service, or other special media.

• Applicable standards, certificate requirements, third-party inspection requirements and pressure test requirements.

• Whether repair kits, wear parts, manuals, tool kits, or manifold assemblies are required.

• Packaging, rust prevention, transportation mode, trade terms and destination.

This manual is a general operation and maintenance document for swivel joints. Field operation shall also comply with owner safety rules, equipment nameplates, product drawings, project technical agreements and applicable standards.

Customer Feedback / After-Sales Service Information

Customer Feedback Form

Product Name		**Model / Specification**	
Product No.		**Date of Manufacture**	
User / Customer		**Contact Person**	
Telephone		**Email**	
Service Condition		**Date of Use**	
Issue Type	□ Operation □ Maintenance □ Quality □ Transportation □ Other	**Urgency**	□ General □ Important □ Urgent
Issue Description			
Field Description			
Suggestions			
Signature		**Date**	

Manufacturer and Technical Support

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Scan to view product details